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FINAL REMEDIAL INVESTIGATION REPORT ADDENDUM (SWMU 6) ATLANTIC FLEET WEAPONS TRAINING AREA FORMER NAVAL AMMUNITION SUPPORT DETACHMENT VIEQUES ISLAND PUERTO RICO

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CH2M HILL

Final

Remedial Investigation Report - Addendum
Solid Waste Management Unit (SWMU) 6

Atlantic Fleet Weapons Training Area—Vieques
Former Naval Ammunition Support Detachment
Vieques, Puerto Rico

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Executive Summary

Solid Waste Management Unit (SWMU) 6 is the Former Mangrove Disposal Site, located on the Former Naval Ammunition Support Detachment (NASD), Vieques, Puerto Rico (**Figures ES-1 and ES-2**). The site was used for the disposal of general solid waste during the 1960s and 1970s from Department of the Navy (Navy) operations within the former NASD.

The SWMU 6 Remedial Investigation (RI) was conducted in 2007 (CH2M HILL, 2007) and an interim removal action was conducted in 2009 (Shaw, 2010). Waste debris and impacted soil were removed which resulted in the environmental setting changing from a predominantly terrestrial habitat to a shallow, open water lagoon, which in turn resulted in a change to the exposure pathways to human and ecological receptors. Based on potentially unacceptable risks determined using post-removal confirmatory surface water and sediment data (February 2011) and biota data (January 2012), a Feasibility Study (FS) was completed to evaluate remedial alternatives to address the sediment chemicals of concern (COCs) identified by the risk assessments (CH2M HILL, 2013). Sediment preliminary remediation goals (PRGs) were developed for Aroclor-1254, lead, and zinc. For PCBs (i.e., sum of aroclors), 1 mg/kg was determined to be the PRG for protection of human health (CH2M HILL, 2014). For protection of benthic organisms, the lead PRG was determined to be 218 mg/kg and the zinc PRG determined to be 410 mg/kg. Using the established PRGs for PCBs, lead, and zinc, a contaminated sediment delineation study was implemented in 2014 to determine the horizontal and vertical extent of these sediment COC concentrations above PRGs. The details of the sampling, including rationale and approach, are presented in the *Contaminated Sediment Delineation to Support Feasibility Study Alternative Evaluation Sampling and Analysis Plan* (SAP) (CH2M HILL, 2014).

This RI Addendum summarizes the analytical findings of the SWMU 6 Contaminated Sediment Delineation Study, including delineation of the extent of COCs above PRGs, the potential human health and ecological risk evaluations using the data collected during the study, and a characterization of the lagoon ecosystem that has developed since the 2009 removal action.

The SWMU 6 sediment delineation investigation, which included the analysis of COCs (total PCBs, lead, and zinc) in 128 surface and subsurface lagoon sediment samples (plus QA/QC samples), showed that total PCBs were below the PRG in all samples. Zinc and lead exceeded PRGs in a low number of samples, representing a small portion of the lagoon (approximately 0.07 acre); however, mean concentrations, which are more applicable to evaluating communities of benthic organisms, were below respective PRGs (i.e., neither of the two mean hazard quotients (HQs) exceeded 1). In addition, a characterization of the SWMU 6 lagoon ecosystem in December 2014 documented a diverse, and in many cases very abundant, community of fish and invertebrates that are typical of mangrove lagoons. Planted and naturally recruited mangroves and seagrass are successfully filling in open habitats created by the 2009 removal action, and the lagoon is providing forage for a variety of birds including many migratory species. Additional intrusive site remedial actions would significantly disrupt the ongoing successional development of this lagoon ecosystem.

Based on the absence of PCBs above the PRG, acceptable ecological risk to sediment organisms, and the current biological productivity and continuing successful maturation of the lagoon ecosystem, no further remedial action is warranted.

Resumen Ejecutivo

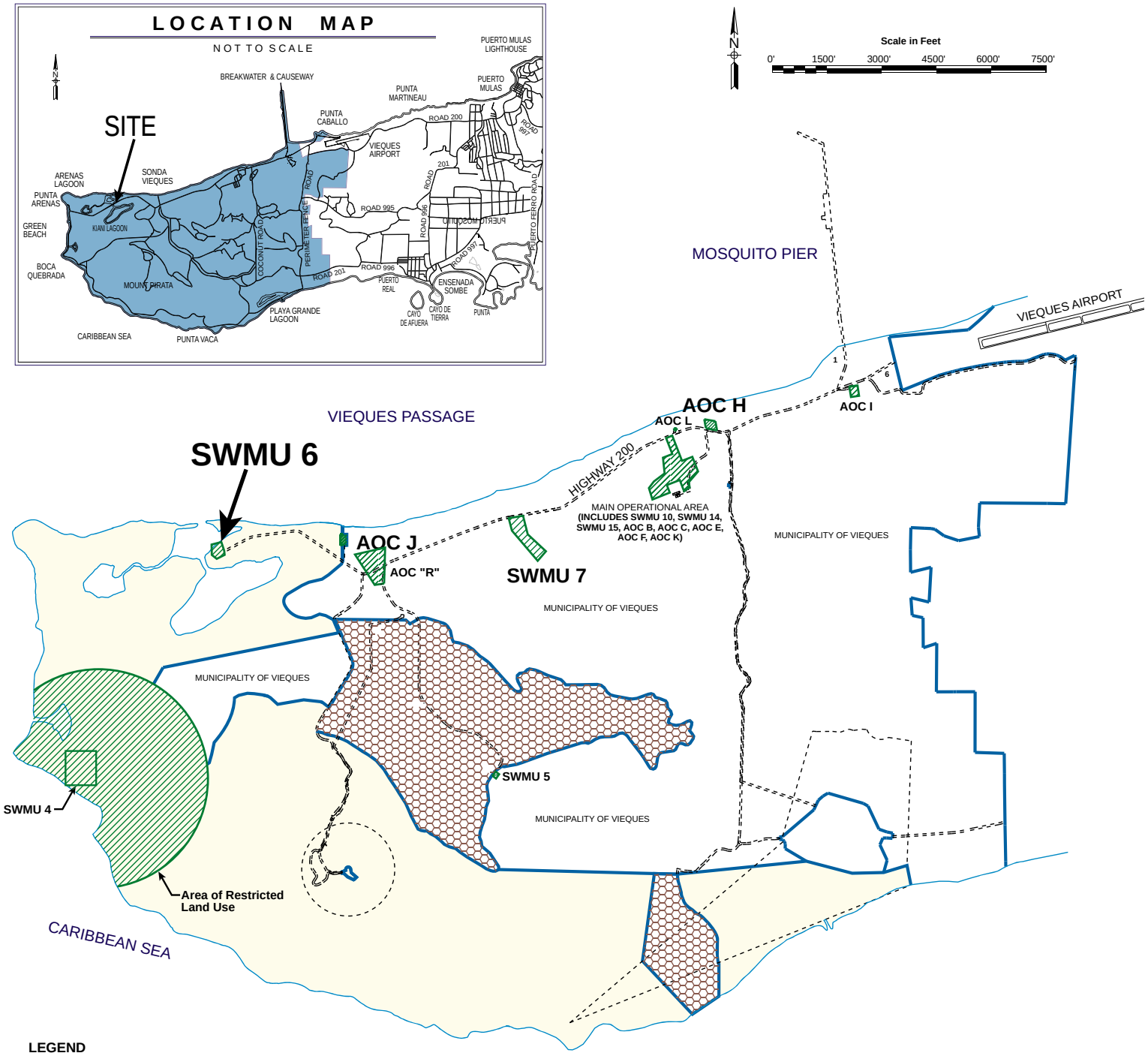
La Unidad de Desperdicios Sólidos (SWMU por sus siglas en inglés) 6 es el Antiguo Sitio de Disposición en el Manglar, ubicado en el Antiguo Destacamento de Apoyo a Municiones Navales (NASD por sus siglas en inglés) Vieques, Puerto Rico (Figuras ES-1 y ES-2). El sitio fue usado para la disposición de desperdicios sólidos generales generados durante las operaciones del Departamento de la Marina (Marina) dentro del antiguo NASD durante los años 1960s y 1970s.

La Investigación para la Remediación (RI por sus siglas en ingles) de SWMU 6 se llevó a cabo en 2007 (CH2M HILL, 2007) y una acción de remoción interina se llevó a cabo en 2009 (Shaw, 2010). Los escombros de basura y suelo impactado fueron removidos provocando un cambio del ambiente de un hábitat predominantemente terrestre a una laguna llana y abierta, la cual a su vez cambió las vías de exposición para receptores humanos y ecológicos. Basado en riesgos potencialmente inaceptables determinados usando datos de muestreo confirmatorio para agua superficial y sedimentos (Febrero 2011) y de biota (Enero 2012) luego de la remoción, se completó un Estudio de Viabilidad (FS, por sus siglas en inglés) para evaluar alternativas de remedición para atender los químicos de preocupación potencial en el sedimento (COCs por sus siglas en inglés) identificados en las evaluaciones de riesgo (CH2M HILL, 2013). Se desarrollaron metas de remediación preliminares para el sedimento (PRGs, por sus siglas en inglés) para Aroclor-1254, plomo, y zinc. Para los PCBs (es decir, la suma de aroclors), se determinó 1 mg/kg como el PRG para proteger la salud humana (CH2M HILL, 2014). Para proteger los organismos bénticos, se determinó el PRG para plomo como 218 mg/kg, y el PRG para zinc se determinó como 410 mg/kg. Usando los PRGs establecidos para los PCBs, el plomo y el zinc, en el 2014 se implementó un estudio de delineación de sedimentos contaminados para determinar la extensión horizontal y vertical de estas concentraciones de COCs en sedimentos por encima de los PRGs. Los detalles del muestreo, incluyendo el razonamiento y el alcance, se presentan en la Delineación del Sedimento Contaminado para Apoyar el Plan de Muestreo y Análisis (SAP por sus siglas en inglés) de la Evaluación de Alternativas para el Estudio de Viabilidad (CH2M HILL, 2014).

Este Anejo al RI resume los resultados analíticos del estudio de delimitación de sedimentos contaminados en SWMU 6, incluyendo la delineación de la extensión de los COCs en concentraciones por encima de los PRGs, las evaluaciones de riesgos potenciales para la salud humana y el ambiente que se realizaron usando los datos que se obtuvieron durante el estudio, y una caracterización del sistema de la laguna que se ha desarrollado desde la acción de remoción en 2009.

La investigación de delineación de sedimentos de SWMU 6, la cual incluyó el análisis de COCs (PCBs totales, plomo y zinc) en 128 muestras de sedimento de la superficie y debajo de la superficie de la laguna (más las muestras adicionales para QA/QC), demostró que los PCB totales estuvieron por debajo de los PRGS en todas las muestras. El zinc y el plomo excedieron los PRGs en un número pequeño de muestras, lo que representa una porción reducida de la laguna (aproximadamente 0.07 acre); sin embargo, las concentraciones promedio, las cuales son más aplicables para evaluar las comunidades de organismos bénticos, estuvieron por debajo de sus respectivos PRGs (es decir, ninguno de los dos coeficientes de peligro (HQs) promedio excedieron 1). Además, una caracterización del ecosistema de la laguna de SWMU 6 en diciembre de 2014 documentó una diversa, y en muchos casos muy abundante comunidad de peces e invertebrados que son típicos de lagunas de manglares. Mangles replantados y los que se han propagados y yerbas marinas están exitosamente cubriendo los hábitats abiertos que se crearon por la acción de remoción de 2009, y la laguna está proveyendo una fuente de alimento para una variedad de aves, incluyendo muchas especies migratorias. Acciones de remediación intrusivas adicionales disturbarían significativamente el desarrollo sucesivo actual del ecosistema de esta laguna.

Basado en la ausencia de PCBs por encima de los PRG, un riesgo ecológico aceptable para los organismos del sedimento y la productividad biológica actual, y la maduración continua exitosa del ecosistema de la laguna, no se amerita se realice una acción de remediación adicional.



SOURCE:
VIEQUES NASD SURVEY LAND TRANSFER & DISPOSAL OVERALL LOCATION SURVEY
PREPARED BY GLENN & SADLER AND LUIS BERRIOS MONTES & ASSOCIATES

Figure ES-1
SWMU 6 Site Location Map
SWMU 6 Remedial Investigation Report – Addendum
Vieques, Puerto Rico

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Figure ES-2
Aerial Photographs of SWMU 6
SWMU 6 Remedial Investigation Report – Addendum
Vieques, Puerto Rico

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Acronyms and Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLEAN	Comprehensive Long-term Environmental Action—Navy
COC	chemical of concern
CTO	Contract Task Order
EqP	equilibrium partitioning-based
ER-L	Effects Range-Low
ER-M	Effects Range-Medium
ERA	Ecological Risk Assessment
ERP	Environmental Restoration Program
FS	Feasibility Study
HQ	hazard quotient
mg/kg	milligrams per kilogram
NASD	Naval Ammunition Support Detachment
NAVFAC	Naval Facilities Engineering Command, Atlantic
Navy	Department of the Navy
NOAEL	No Observed Adverse Effect Level
PCB	polychlorinated biphenyl
PRG	preliminary remediation goals
QA	quality assurance
QC	quality control
RAO	remedial action objectives
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
SWMU	Solid Waste Management Unit
TRV	toxicity reference value
UCL	upper confidence limit
USFWS	United States Fish and Wildlife Service

SECTION 1

Introduction

Solid Waste Management Unit (SWMU) 6 is the Former Mangrove Disposal Site, located on the Former Naval Ammunition Support Detachment (NASD), Vieques, Puerto Rico (**Figures 1 and 2**). The site was used for the disposal of general solid waste during the 1960s and 1970s from Department of the Navy (Navy) operations within the former NASD.

The SWMU 6 Remedial Investigation (RI) was conducted in 2007 (CH2M HILL, 2007) and an interim removal action was conducted in 2009 (Shaw, 2010). Waste debris and impacted soil were removed which resulted in the environmental setting changing from a predominantly terrestrial habitat to a shallow, open water lagoon, which in turn resulted in a change to the exposure pathways to human and ecological receptors. Based on potentially unacceptable risks determined using post-removal confirmatory surface water and sediment data (February 2011) and biota data (January 2012), a Feasibility Study (FS) was completed to evaluate remedial alternatives to address the sediment chemicals of concern (COCs) identified by the risk assessments: Aroclor-1254 (a polychlorinated biphenyl [PCB]) for human consumption of fish/crabs), and cadmium, copper, lead, and zinc for direct exposure to benthic organisms (CH2M HILL, 2013). As discussed in Section 5.4 of the FS (CH2M HILL, 2013), sediment preliminary remediation goals (PRGs) were developed for Aroclor-1254, lead, and zinc. Based on discussions held at the May 2013 Technical Subcommittee meeting, the PCB-related COC was concurred to be total PCBs (i.e., sum of aroclors) rather than just Aroclor-1254, and 1 milligrams per kilogram (mg/kg) was concurred on as the corresponding PRG for protection of human health (CH2M HILL, 2014). For protection of benthic organisms, Effects Range-Median (ER-M) values, which represent the 50th percentile of the ranked effects data used to develop the Effects Range-Low (ER-L), were selected to identify sediment PRGs because of: (1) the level of conservatism of the ER-L values, (2) the ecological remedial action objective (RAO) stated in Section 5.2 of the FS, and (3) the past use of ER-M values as remediation criteria at other Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites. Because the ER-M values for cadmium and copper were higher than their maximum detected concentrations in SWMU 6 lagoon sediment, no PRGs for these two inorganics were necessary. Based on the PRGs developed for Aroclor-1254 (1 mg/kg), lead (218 mg/kg), and zinc (410 mg/kg), a contaminated sediment delineation study was subsequently implemented in 2014 to determine the horizontal and vertical extent of these sediment COC concentrations above PRGs. The details of the sampling, including rationale and approach, are presented in the *Contaminated Sediment Delineation to Support Feasibility Study Alternative Evaluation Sampling and Analysis Plan* (SAP) (CH2M HILL, 2014).

This RI Addendum summarizes the analytical findings of the SWMU 6 Contaminated Sediment Delineation Study, including delineation of the extent of COCs above PRGs, the potential ecological risk to sediment organisms exposed to surface sediment COCs, and a characterization of the lagoon ecosystem that has developed since the 2009 removal action.

1.1 Objectives and Summary of Analytical Findings

The SWMU 6 Sediment Delineation Study objective was to determine the horizontal and vertical extent of COC (total PCBs [sum of aroclors], lead, and zinc) concentrations in sediment above the PRGs. Originally, this was intended to help refine the potential remediation area and volume assumed in the FS. To meet this objective, sediment cores were collected from 32 locations in a grid-based pattern across the lagoon, with analytical samples collected from each core at four depth intervals generally comprising 0 to 6 inches, 24 to 30 inches, 48 to 54 inches, and 72 to 78 inches below sediment surface. At two locations, sediment profile characteristics warranted (per the SAP) collection of samples from depths other than the pre-determined intervals. Station VWW06-SD049 (**Figures 3 and 4**) had a unique layer of fat clay from 26 to 36 inches that was sampled (in place of the 24 to 30 inch interval), and station VWW06-SD054 (**Figures 3 and 4**) had an organic layer (54 to 60 inches) comprising mostly woody material that was sampled (in place of the 48 to 54 inch interval). A total of 128

samples (plus quality assurance/quality control [QA/QC] samples) were collected. Example sediment core photos and boring logs are provided in **Appendix A**, and sample core station coordinates are provided in **Appendix B**.

Analytical results statistics are summarized in **Table 1** and detailed analytical results are provided in **Appendix C**. The Data Validation Report and Data Quality Evaluation report are provided in **Appendices D and E**, respectively.

Total PCB concentrations in all samples were below the PRG of 1 mg/kg for protection of human health; therefore, no remedial action is warranted for PCBs.

As discussed in the Ecological Risk Assessment (ERA) included in the FS Report (CH2M HILL, 2013), there is no unacceptable ecological risk due to PCBs. The ERA determined that the mean sediment Aroclor-1254 concentration in the SWMU 6 lagoon was less than the equilibrium partitioning-based (EqP) sediment screening value protective of directly exposed benthic organisms. In addition, mean concentrations of total PCBs detected in blue crab (whole-body) and finfish (snook and mullet; whole-body but gutted) tissue samples collected for evaluation of potential human exposures were entered into aquatic food web models. Upper trophic level aquatic wildlife receptors evaluated for SWMU 6 included the spotted sandpiper (aquatic avian invertivore), green heron (aquatic avian piscivore/invertivore), and fishing bat (aquatic mammalian piscivore) (see Attachment D of the FS Report ERA [CH2M HILL, 2013]). These food web models included exposures to contaminants measured in tissues and sediment, as appropriate; exposure to marine surface water was excluded because it is unsuitable as a drinking water source. Hazard quotients based on No Observed Adverse Effect Level (NOAEL) toxicity reference values (TRVs) were all less than one for aquatic wildlife food chain exposures to PCBs. Therefore, PCBs are not COCs for ecological risk and therefore it was not necessary to identify an ecological PRG for PCBs.

Overall, lead and zinc exceedances of sediment PRGs were confined to the surface of the sediment profile throughout the sampling area. Lead and zinc exceeded their respective PRGs in only several samples, nearly all of which were in the top six inches. For lead, 11 of the 12 PRG exceedances (out of 128 samples) occurred in surface sediment samples (0-6 inches), with the remaining single exceedance occurring at a depth of 72-78 inches at location VWW06-SD039 (**Figure 3**). This lone subsurface exceedance is likely the result of the bottom of the sediment coring tube contacting surface sediment following core collection; the detected concentration was 254 mg/kg which is comparable to the surface concentration of 289 mg/kg at this location, whereas lead concentrations at intermediate depth intervals (24-30 and 48- 54 inches) ranged from 1.03 J to 1.48 J mg/kg. Therefore, this subsurface detection of lead above the PRG is not considered an indication of vertical lead migration. For zinc, the 10 exceedances of the PRG all occurred in surface sediment (0-6 inches) samples (**Figure 4**).

The potential original sources of lead and zinc at SWMU 6 were the debris piles which were removed during the interim action; though lead and zinc remain present at the surface there is no additional source resupplying contamination to the site. The sediment surficial zone throughout the lagoon is subject to ongoing bioturbation, biological and geochemical processes, and sediment movement driven by daily tidal fluctuations, which the deeper sediment is not subject to (at least to the same degree).

Horizontal delineation of metals across the site was achieved. Concentrations along the western and southern boundaries of the investigation area do not exceed PRGs. Horizontal delineation to the north is complete because the bank of the lagoon is immediately adjacent to the northern sample locations and because the metals concentrations in samples collected just outside the only outlet from the lagoon were well below PRGs. To the east, delineation is also complete due to the absence of PRG exceedances in sediment samples and historical soil samples in this area, the latter of which are shown in **Figures 3 and 4**.

Based on discussions held at the October 2014 Environmental Restoration Program (ERP) Technical Subcommittee meeting regarding preliminary SWMU 6 sediment delineation analytical results, it was agreed that the lead and zinc data would be further evaluated for potential risk to benthic organisms to determine if sediment remedial action is still warranted, considering that there is no longer a human health concern (based on total PCBs being less than the PRG in all samples) and the adverse impact that a sediment removal action

would have on the well-established lagoon ecosystem at this site. As a result, the following subsections present: (1) an ecological risk evaluation of lead and zinc in surface sediment, and (2) an assessment of current lagoon ecosystem characteristics at SWMU 6.

1.2 Evaluation of Potential Risk to Benthic Organisms

Surface sediment concentrations for the ecological COCs (lead and zinc) were evaluated for ecological exposures to benthic organisms. This evaluation consisted of a comparison of the ecologically-based sediment PRGs with surface sediment data from both the 2014 sediment delineation investigation (32 samples) and the 2011 post-removal supplemental confirmatory investigation (8 samples). The sediment PRGs (218 mg/kg for lead and 410 mg/kg for zinc) are based on ER-M values, which represent the 50th percentile of the ranked effects data used to develop ER-L values (Long et. al., 1995). ER-M values were selected to identify sediment PRGs for the site because: (1) the high level of conservatism of the ER-L, (2) the ecological RAO presented in the FS Report, and (3) the past use of ER-M values as remediation criteria at other CERCLA sites. The sediment samples used are listed in **Table 2** and resulting PRG exceedances (for both surface and subsurface samples) are shown on **Figure 3** (lead exceedances) and **Figure 4** (zinc exceedances). **Figures 3 and 4** also show two offsite sediment stations (SD001 and SD002) within the Kiani Lagoon complex, immediately outside the northern connection with the SWMU 6 lagoon. These samples were not included in the risk evaluation, but demonstrate there has been no offsite migration of lead or zinc contaminants; lead concentrations ranged from 6.7 J to 25.8 J mg/kg, and zinc concentrations ranged from 39.6 J to 64.7 J mg/kg, all well below PRGs.

Aquatic food web exposures were not considered nor were they warranted because the ERA completed as part of the FS (see Attachment D of the FS Report ERA [CH2M HILL, 2013]) did not identify unacceptable risks to lead and zinc for this exposure pathway when site-specific tissue and media data were used. Note that tissue samples (fish and crab) were collected in January 2012, three years after completion of the 2009 interim removal action. Also note that the original post-removal confirmatory sediment samples were not collected concurrent with the 2012 biota sampling, but were collected earlier (February 2011), following the interim action. These 2011 sediment samples were included with the 2014 data and evaluated as part of this RI Addendum. The 2014 lead (731 mg/kg maximum and 212 mg/kg mean) and zinc (1,110 mg/kg maximum and 331 mg/kg mean) sediment concentrations were similar to the 2011 lead (612 mg/kg maximum and 205 mg/kg mean) and zinc (849 mg/kg maximum and 274 mg/kg mean) concentrations; therefore, tissue samples collected in 2012 are representative of current sediment contaminant levels.

The summary comparison of surface sediment data to PRGs is contained in **Table 3** and sample specific exceedances of the PRGs are shown in **Appendix F**. Lead exceeded the PRG in 13 of 40 surface sediment samples while zinc exceeded the PRG in 12 of 40 surface sediment samples; 10 of these samples exceeded PRGs for both metal COCs (**Appendix F**). The mean hazard quotients (HQs) for lead (0.97) and zinc (0.81) were both less than 1, and the 95% upper confidence limit (UCL) HQ is also less than 1 for zinc and only slightly above 1 for lead (**Table 3**). Central tendency statistics are applicable to evaluations of benthic invertebrate communities because they are evaluated on a community, not individual organism, level. This is particularly relevant for SWMU 6 since the lagoon is relatively small and isolated. Only 25 percent of the surface sediment samples exceeded the PRG for both metals and relatively few of these exceedances were of a magnitude of 1.5 or greater. As shown in **Figure 5**, the estimated area of PRG exceedances is approximately 0.07 acre, which represents about 11 percent of the estimated total area of sediment habitat within the 0.66-acre SWMU 6 area. Further, the results of the biological survey (Section 2) were also integral to the conclusions. While post-removal, site-specific data on metal bioavailability in sediments are not available, the results of the biological survey suggest that a relatively healthy aquatic community has become established on this formerly terrestrial site in the few years that have passed since the removal action created the lagoon.

Mean HQs for lead and zinc in lagoon surface sediment are less than 1, an important indicator of no unacceptable risk to the benthic community and that no further remedial action is warranted. As discussed in Section 2, recent ecological surveys of the SWMU 6 lagoon have documented a healthy, maturing habitat supporting a wide variety of aquatic and semi-aquatic plant and animal species, which additionally supports no further action.

SECTION 2

SWMU 6 Lagoon Ecosystem Evaluation

To provide an additional measure of ecological health and another piece of information to help determine whether additional remedial action at SWMU 6 is warranted, a qualitative ecological survey was conducted in December 2014 to document the current ecological characteristics of the SWMU 6 lagoon. Information was gathered on the presence of aquatic organisms, including fish, macroinvertebrates, aquatic and wetland plants, wildlife, and general physical characteristics. In addition, biological observations from historical site visits are incorporated into the ecosystem characterization that is summarized below.

The site was originally (pre-interim removal action) an estuarine, intertidal, forested wetland dominated by black mangrove (*Avicennia germinans*), but the 2009 interim removal action altered the site to a shallow marine lagoon environment. **Figure 2** shows aerial photographs of SWMU 6 pre- and post-removal action. Since 2009 there have been no significant alterations to lagoon conditions, other than the installation of a chain-link fence along the southern perimeter to discourage public access while the post-removal site evaluation was ongoing.

The SWMU 6 lagoon is hydrologically connected to the Kiani Lagoon complex (immediately north and west of SWMU 6) via a narrow, shallow opening at its northern end that allows daily tidal exchanges, as well as a sheetflow type connection along the northeastern shoreline where at extreme high tides there is inflow of seawater through the adjoining black mangrove forest which then outflows at the northern connection. Most of the lagoon is shallow, averaging about one to two feet deep depending on tidal cycle with a localized central area that is only about three feet deep. Sediment throughout the lagoon comprises about three inches of very loose black silt, typically underlain by about one foot of either black silty sand or sandy clay.

Immediately following the 2009 removal action, several red mangrove (*Rhizophora mangle*) propagules were planted in a shallow restoration area along the eastern shoreline. The mangrove propagules were obtained locally by United States Fish and Wildlife Service (USFWS) staff and planted at their direction. Since this planting approximately five years ago, these mangroves have grown significantly, have matured, and are producing new propagules. Photos 1 through 6 in **Appendix G** show several before and after comparisons indicating the successful restoration of mangroves, and **Figures 3 and 4** illustrate the approximate area of mangrove cover resulting from plantings and/or natural recruitment. Natural recruitment of four species of mangroves has been ongoing along the entire lagoon shoreline as evidenced by the new occurrence of young mangroves in the eastern restoration area, and multiple young and well-grown specimens in areas well beyond the restoration area. For example, as shown in Photos 7 and 8 (**Appendix G**), an area along the southwestern shoreline that was originally bare soil now has naturally recruited red mangroves, black mangroves, and white mangroves (*Laguncularia racemosa*). Button mangrove (*Conocarpus erectus*) plants have also become established in other shoreline locations.

Submerged aquatic plants and algae occur in the lagoon. A large (three by four foot), naturally established patch of turtle grass (*Thalassia testudinum*) was found within the lagoon near the northern outlet (Photo 9, **Appendix G; Figures 3 and 4).** Turtle grass has been seen in nearby shallow areas of the Kiani Lagoon complex, so its observation within the SWMU 6 lagoon indicates it is now becoming established in the developing lagoon habitat. Turtle grass prefers mud substrates in relatively sheltered locations with low turbidity, and it provides good shelter for fish and invertebrates, supports a variety of epiphytes such as algae, diatoms, and bacterial films on the leaf blades, stabilizes the bottom with its roots and rhizomes, and helps maintain water clarity by trapping fine sediments and particles with its leaves. In this same locality, several rhizomes of feather algae (*Caulerpa sertularioides*) were growing on the sediment (Photo 10, **Appendix G**) and, like turtle grass with which it commonly associates, is a species seen elsewhere in the Kiani Lagoon complex and is a new recruit in the SWMU 6 lagoon. Throughout the lagoon were colonies of green horsetails (*Batophora oerstedi*), a common algae found attached to various hard substrates such as shells and rocks.

Fish were found to be abundant throughout the SWMU 6 lagoon, and were those typically expected in a shallow mangrove lagoon habitat. Some of the fish captured are shown in Photos 11 through 16 (**Appendix G**). The most

abundant fish were mojarra, including bigeye mojarra (*Eucinostomus havana) and flagfin mojarra (Eucinostomus melanopterus*), and white mullet (*Mugil curema*). Mojarra are commonly found foraging closely over sand or mud bottoms, and feed on variety of small fish, benthic crustaceans, polychaetes, and detritus. Several hundred were estimated during the recent survey, and were commonly chased by predatory fish. Juvenile white mullet, which were observed in schools totaling about 100 fish, typically occur in muddy bottoms of lagoons and feed on microscopic or filamentous algae and small juveniles of planktonic organisms. Additional species observed included checkered puffer (*Sphoeroides testudineus*), crested goby (*Lophogobius cyprinoides*), banded blenny (*Paraclinus fasciatus*), bay whiff (*Citharichthys spilopterus*), needlefish (*Strongylura* sp.), juvenile barracuda (*Sphyraena barracuda*), juvenile mangrove snapper (*Lutjanus griseus*), juvenile snook (*Centropomus undecimalis*), and a juvenile speckled worm eel (*Myrophis punctatus*). Overall there is a good representation of predatory, bottom foraging, adult, and juvenile fish in the SWMU 6 lagoon system.

Macroinvertebrates (those large enough to be field identified) in surface sediment were primarily surveyed using up to 20 sweeps of a coarse (¼ inch) mesh dip net at five general locations within the lagoon (**Figures 3 and 4**). In other cases, invertebrates observed moving through the water column or along the shoreline were documented. Some of the macroinvertebrates identified are shown in Photos 17 through 26 (**Appendix G**). The diversity of macroinvertebrates at the dip net stations ranged from three to eight taxa, which is likely the result of the loose, silty sediment throughout the lagoon. The predominant invertebrate collected was a snail, virgin nerite (*Neritina virginea*), which occurred at all stations at about seven to 14 snails per square meter. Other invertebrates collected in lower numbers included wedge clams (*Tellina* sp.), purplish tagelus (*Tagelus divisus*) - a mussel species, blue crab (*Callinectes sapidus*), brown shrimp (*Farfantepenaeus aztecus*), amphipod species (found in seagrass and algal mats), and Caribbean mud fiddler crab (*Uca rapax*) - abundant around entire lagoon perimeter on exposed mud and sand flats. Another invertebrate extremely abundant throughout the lagoon, typically during all seasons, is the upside-down jellyfish (*Cassiopea xamachana*) (Photos 27 and 28, **Appendix G**). This species is common to shallow mangrove swamps where it spends its life resting on the sediment with its bell down and tentacles raised up in the water column, exposing symbiotic zooxanthellae in its tissues to sunlight.

The SWMU 6 lagoon supports a wide variety of bird species, some of which are shown in Photos 29 through 32 **(Appendix G**). Species observed include greater yellowlegs (*Tringa melanoleuca*), lesser yellowlegs (*Tringa flavipes*), black-necked stilt (*Himantopus mexicanus*), spotted sandpiper (*Actitis macularius*), black bellied plover (*Pluvialis squatarola*), semi-palmated plover (*Charadrius semipalmatus*), Wilson's plover (*Charadrius wilsonia*), least sandpiper (*Calidris minutilla*), belted kingfisher (*Megaceryle alcyon*), northern waterthrush (*Parkesia noveboracensis*), green heron (*Butorides virescens*), little blue heron (*Egretta caerulea*), great egret (*Ardea alba*), great blue heron (*Ardea Herodias*), and clapper rail (*Rallus longirostris*). All of these species were observed directly foraging for fish or invertebrates in the lagoon.

The primary observation is that the SWMU 6 lagoon is providing significant, healthy habitat for a wide variety of aquatic and semi-aquatic species. Native vegetation, including four species of mangroves and turtle grass, are naturally filling in the open shoreline and aquatic habitat. The growth of these plants is continuing to build a foundation for the complex marine food chain and detrital food cycle provided by mangrove swamps. Co-occurring lead and zinc concentrations do not indicate adverse impacts to plants (mangroves, seagrass, macroalgae) or qualitatively sampled macroinvertebrates. Based on field observations to date, the SWMU 6 lagoon is serving as a nursery for juvenile fish, and the diverse fish and invertebrate communities are providing forage for piscivorous and invertivorous bird species, many of which are migratory species such as the shorebirds and northern waterthrush. The healthy, maturing ecosystem characteristics of the SWMU 6 lagoon, together with results of the ecological risk screening showing no unacceptable risk to the benthic community (Section 1.2), demonstrates no additional remedial action is warranted.

SECTION 3

Conclusions and Recommendations

The SWMU 6 Sediment Delineation Investigation, which included the analysis of COCs (total PCBs, lead, and zinc) in 128 surface and subsurface lagoon sediment samples (plus quality assurance (QA)/quality control (QC) samples), showed that total PCBs were below the PRG in all samples. Zinc and lead exceeded PRGs in a low number of samples representing a small portion of the lagoon (approximately 0.07 acre); however, mean concentrations, which are more applicable to evaluating communities of benthic organisms, were below respective PRGs (i.e., neither of the two mean HQs exceeded 1). In addition, a characterization of the SWMU 6 lagoon ecosystem in December 2014 documented a diverse, and in many cases very abundant, community of fish and invertebrates that are typical of mangrove lagoons. Planted and naturally recruited mangroves and seagrass are successfully filling in open habitats created by the 2009 removal action, and the lagoon is providing forage for a variety of birds including many migratory species. Additional intrusive site remedial actions would significantly disrupt the ongoing successional development of this lagoon ecosystem.

Based on the absence of PCBs above the PRG, acceptable ecological risk to sediment organisms, and the current biological productivity and continuing successful maturation of the lagoon ecosystem, no further remedial action is warranted.

SECTION 4

References

CH2M HILL. 2007. *Remedial Investigation Report, Solid Waste Management Unit (SWMU) 6, Former Naval Ammunition Support Detachment, Vieques Island, Puerto Rico*. February.

CH2M HILL. 2013. *Feasibility Study Report, Solid Waste Management Unit (SWMU) 6, Atlantic Fleet Weapons Training Area – Vieques, Former Naval Ammunition Support Detachment, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico*. January.

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Long, E.R., D.D. MacDonald, S.L. Smith, and F.D. Calder. 1995. Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. *Environmental Management*. 19:81-97.

Shaw. 2010. *Final Completion Report, Removal Actions SWMU 6, SWMU 7, AOC J, and AOC R, Former Naval Ammunitions Support Detachment, Vieques, Puerto Rico*. March.

Tables

Table 1
Summary of Analytical Results - SWMU 6 Sediment Delineation
Former Naval Ammunition Support Detachment, Vieques, Puerto Rico

Chemical	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	PRG	Frequency of PRG Exceedance
PCBs (MG/KG)					
Total PCBs	22 / 128	0.0161	0.406	1.0	0 / 128
Inorganics (MG/KG)					
Lead	127 / 128	0.84	731	218	12 / 128
Zinc	118 / 128	2.98	1,110	410	10 / 128

Table 2
SWMU 6 Surface Sediment Samples Used in the Ecological Evaluation
Former Naval Ammunition Support Detachment, Vieques, Puerto Rico

Location	Sample ID	Sample Depth (in)	Sample Date
VWW06-SD003	VWW06-SD003-0211	0-6	2/4/2011
VWW06-SD004	VWW06-SD004-0211	0-6	2/4/2011
VWW06-SD005	VWW06-SD005-0211	0-6	2/4/2011
VWW06-SD006	VWW06-SD006-0211	0-6	2/4/2011
VWW06-SD006	VWW06-SD006P-0211	0-6	2/4/2011
VWW06-SD007	VWW06-SD007-0211	0-6	2/4/2011
VWW06-SD008	VWW06-SD008-0211	0-6	2/4/2011
VWW06-SD009	VWW06-SD009-0211	0-6	2/4/2011
VWW06-SD010	VWW06-SD010-0211	0-6	2/4/2011
VWW06-SD024	VWW06-SD024-0006	0-6	8/5/2014
VWW06-SD024	VWW06-SD024P-0006	0-6	8/5/2014
VWW06-SD025	VWW06-SD025-0006	0-6	8/5/2014
VWW06-SD026	VWW06-SD026-0006	0-6	8/5/2014
VWW06-SD027	VWW06-SD027-0006	0-6	8/5/2014
VWW06-SD028	VWW06-SD028-0006	0-6	8/5/2014
VWW06-SD029	VWW06-SD029-0006	0-6	8/4/2014
VWW06-SD030	VWW06-SD030-0006	0-6	8/4/2014
VWW06-SD031	VWW06-SD031-0006	0-6	8/4/2014
VWW06-SD032	VWW06-SD032-0006	0-6	8/4/2014
VWW06-SD033	VWW06-SD033-0006	0-6	8/5/2014
VWW06-SD034	VWW06-SD034-0006	0-6	8/1/2014
VWW06-SD035	VWW06-SD035-0006	0-6	8/1/2014
VWW06-SD035	VWW06-SD035P-0006	0-6	8/1/2014
VWW06-SD036	VWW06-SD036-0006	0-6	8/1/2014
VWW06-SD037	VWW06-SD037-0006	0-6	7/31/2014
VWW06-SD038	VWW06-SD038-0006	0-6	7/31/2014
VWW06-SD039	VWW06-SD039-0006	0-6	7/31/2014
VWW06-SD040	VWW06-SD040-0006	0-6	7/30/2014
VWW06-SD041	VWW06-SD041-0006	0-6	7/30/2014
VWW06-SD042	VWW06-SD042-0006	0-6	7/30/2014
VWW06-SD043	VWW06-SD043-0006	0-6	7/30/2014
VWW06-SD044	VWW06-SD044-0006	0-6	7/31/2014
VWW06-SD045	VWW06-SD045-0006	0-6	7/31/2014
VWW06-SD046	VWW06-SD046-0006	0-6	7/29/2014
VWW06-SD047	VWW06-SD047-0006	0-6	7/29/2014
VWW06-SD048	VWW06-SD048-0006	0-6	7/29/2014
VWW06-SD049	VWW06-SD049-0006	0-6	7/29/2014
VWW06-SD050	VWW06-SD050-0006	0-6	7/29/2014
VWW06-SD050	VWW06-SD050P-0006	0-6	7/29/2014
VWW06-SD051	VWW06-SD051-0006	0-6	7/28/2014
VWW06-SD052	VWW06-SD052-0006	0-6	7/28/2014
VWW06-SD053	VWW06-SD053-0006	0-6	7/28/2014
VWW06-SD054	VWW06-SD054-0006	0-6	7/28/2014
VWW06-SD055	VWW06-SD055-0006	0-6	7/30/2014

Shaded samples indicate field duplicates

Table 3

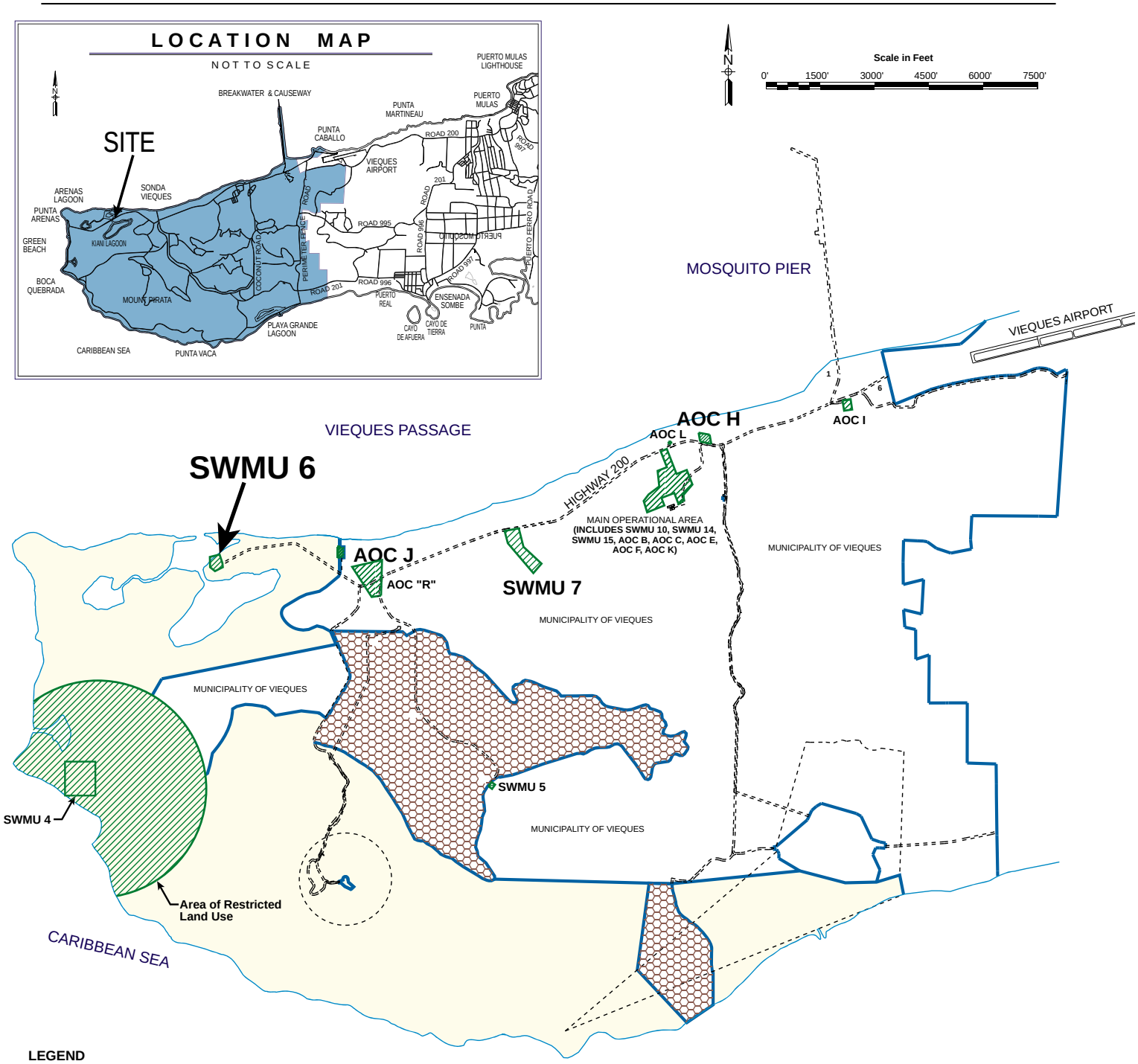
Ecological Screening Statistics - SWMU 6 Surface Sediment - Post-Removal Conditions

Former Naval Ammunition Support Detachment, Vieques, Puerto Rico

Chemical	Range of Non-Detect Values	Frequency of Detection	Minimum Concentration Detected	Maximum Concentration Detected	Sample ID of Maximum Detected Concentration	Arithmetic Mean	Standard Deviation of Mean	95% UCL	PRG	Frequency of Exceedance[1]	Maximum Hazard Quotient	95% UCL Hazard Quotient	Mean Hazard Quotient
Inorganics (MG/KG)													
Lead	-- - --	40 / 40	1.88	731	VWW06-SD045-0006	212	156	271	218	13 / 40	3.35	1.24	0.97
Zinc	-- - --	40 / 40	10.7	1,110	VWW06-SD045-0006	331	233	394	410	12 / 40	2.71	0.96	0.81

1 - Count of detected samples exceeding or equaling PRG

Figures



LEGEND

PROPERTY LINE
EASEMENT LINE
APPROXIMATE EDGE OF WATER
UNITED STATES GOVERNMENT\ DEPARTMENT OF THE INTERIOR
PUERTO RICO CONSERVATION TRUST
AREA OF RESTRICTED LAND USE AT SWMUs AND AOCs

SOURCE:
VIEQUES NASD SURVEY LAND TRANSFER & DISPOSAL OVERALL LOCATION SURVEY
PREPARED BY GLENN & SADLER AND LUIS BERRIOS MONTES & ASSOCIATES

Figure 1
SWMU 6 Site Location Map
SWMU 6 Remedial Investigation Report – Addendum
Vieques, Puerto Rico

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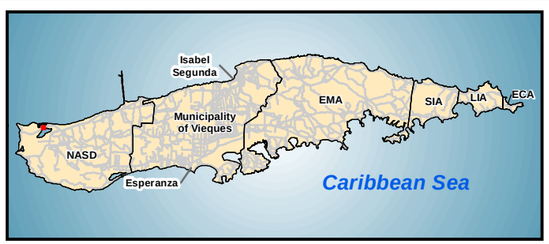
SWMU 6



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Feet

Figure 2
Aerial Photographs of SWMU 6
SWMU 6 Remedial Investigation Report – Addendum
Vieques, Puerto Rico

ch2m

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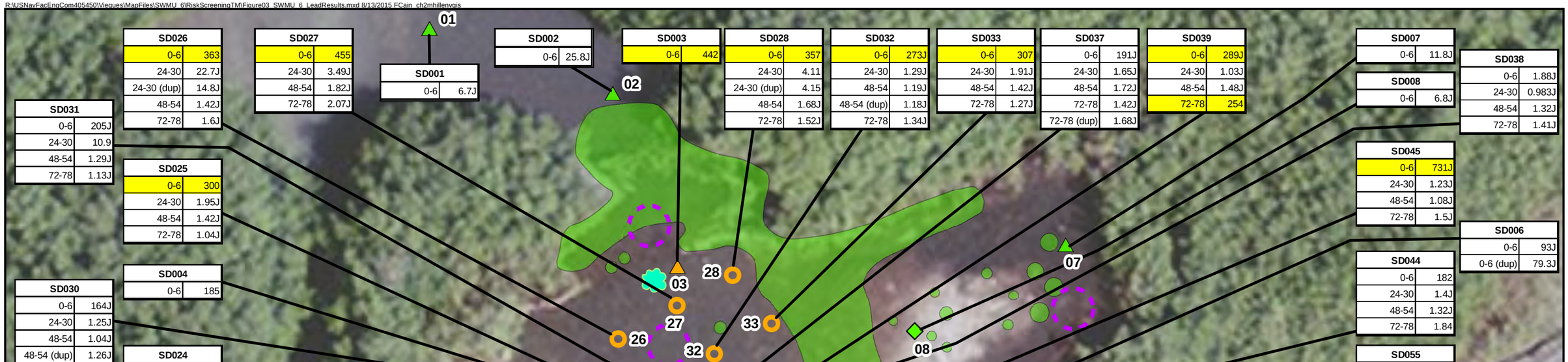

Sediment Sample August 2014

- Does not exceed PRG
- Exceeds PRG

Sediment Sample February 2011

- Sediment does not exceed PRG
- Sediment Exceeds PRG
- Soil does not exceed PRG

- Turtle Grass (Thalassia testudinum) patch, and feather algae (Caulerpa sertularioides) patch, naturally recruited.
- Qualitative macroinvertebrate survey conducted in this area
- Area of mangrove cover resulting from plantings and/or natural recruitment.

COC	PRG(mg\kg)
Lead	218

Yellow highlighted values exceed the Preliminary Remedial Goal (PRG)

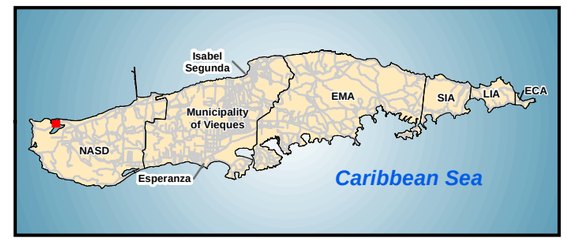

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Figure 3
Sediment Lead Sample Results
SWMU 6 Remedial Investigation Report – Addendum
Vieques, Puerto Rico

ch2m

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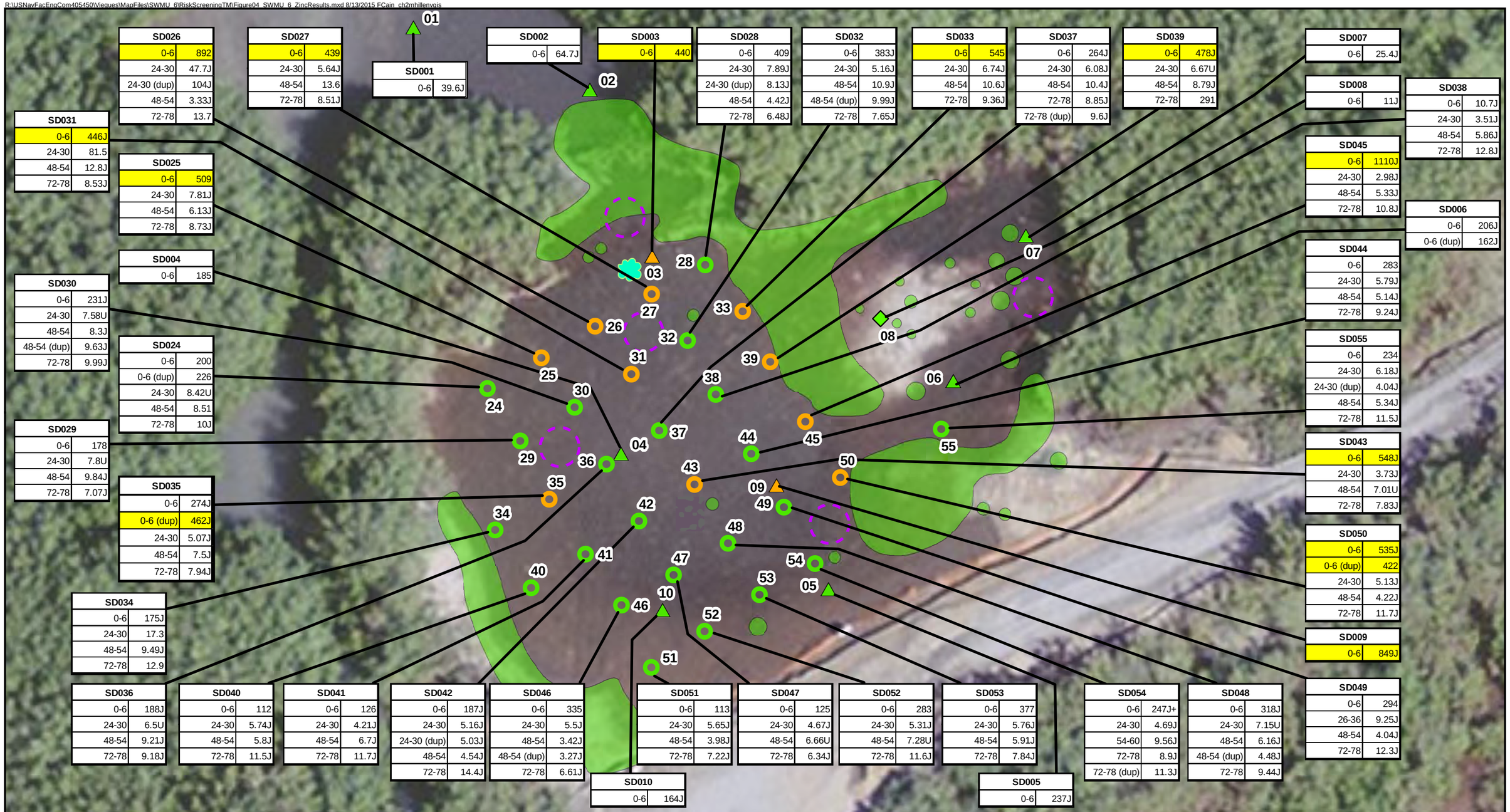


SD026	
0-6	892
24-30	47.7J
24-30 (dup)	104J
48-54	3.33J
72-78	13.7

SD027	
0-6	439
24-30	5.64J
48-54	13.6
72-78	8.51J

SD001	
0-6	39.6J

SD002	
0-6	64.7J

SD003	
0-6	440

SD028	
0-6	409
24-30	7.89J
24-30 (dup)	8.13J
48-54	4.42J
72-78	6.48J

SD032	
0-6	383J
24-30	5.16J
48-54	10.9J
48-54 (dup)	9.99J
72-78	7.65J

SD033	
0-6	545
24-30	6.74J
48-54	10.6J
72-78	9.36J

SD037	
0-6	264J
24-30	6.08J
48-54	10.4J
72-78	8.85J
72-78 (dup)	9.6J

SD039	
0-6	478J
24-30	6.67U
48-54	8.79J
72-78	291

SD007	
0-6	25.4J

SD008	
0-6	11J

SD038	
0-6	10.7J
24-30	3.51J
48-54	5.86J
72-78	12.8J

SD045	
0-6	1110J
24-30	2.98J
48-54	5.33J
72-78	10.8J

SD006	
0-6	206J
0-6 (dup)	162J

SD044	
0-6	283
24-30	5.79J
48-54	5.14J
72-78	9.24J

SD055	
0-6	234
24-30	6.18J
24-30 (dup)	4.04J
48-54	5.34J
72-78	11.5J

SD043	
0-6	548J
24-30	3.73J
48-54	7.01U
72-78	7.83J

SD050	
0-6	535J
0-6 (dup)	422
24-30	5.13J
48-54	4.22J
72-78	11.7J

SD009	
0-6	849J

SD049	
0-6	294
26-36	9.25J
48-54	4.04J
72-78	12.3J

SD031	
0-6	446J
24-30	81.5
48-54	12.8J
72-78	8.53J

SD025	
0-6	509
24-30	7.81J
48-54	6.13J
72-78	8.73J

SD004	
0-6	185

SD030	
0-6	231J
24-30	7.58U
48-54	8.3J
48-54 (dup)	9.63J
72-78	9.99J

SD024	
0-6	200
0-6 (dup)	226
24-30	8.42U
48-54	8.51
72-78	10J

SD029	
0-6	178
24-30	7.8U
48-54	9.84J
72-78	7.07J

SD035	
0-6	274J
0-6 (dup)	462J
24-30	5.07J
48-54	7.5J
72-78	7.94J

SD034	
0-6	175J
24-30	17.3
48-54	9.49J
72-78	12.9

SD036	
0-6	188J
24-30	6.5U
48-54	9.21J
72-78	9.18J

SD040	
0-6	112
24-30	5.74J
48-54	5.8J
72-78	11.5J

SD041	
0-6	126
24-30	4.21J
48-54	6.7J
72-78	11.7J

SD042	
0-6	187J
24-30	5.16J
24-30 (dup)	5.03J
48-54	4.54J
72-78	14.4J

SD046	
0-6	335
24-30	5.5J
48-54	3.42J
48-54 (dup)	3.27J
72-78	6.61J

SD051	
0-6	113
24-30	5.65J
48-54	3.98J
72-78	7.22J

SD047	
0-6	125
24-30	4.67J
48-54	6.66U
72-78	6.34J

SD052	
0-6	283
24-30	5.31J
48-54	7.28U
72-78	11.6J

SD053	
0-6	377
24-30	5.76J
48-54	5.91J
72-78	7.84J

SD054	
0-6	247J+
24-30	4.69J
54-60	9.56J
72-78	8.9J
72-78 (dup)	11.3J

SD048	
0-6	318J
24-30	7.15U
48-54	6.16J
48-54 (dup)	4.48J
72-78	9.44J

SD010	
0-6	164J

SD005	
0-6	237J

Sediment Sample August 2014

- Does not exceed PRG
- Exceeds PRG

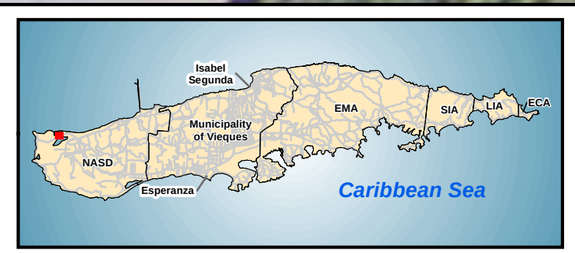
Sediment Sample February 2011

- Sediment does not exceed PRG
- Sediment Exceeds PRG
- Soil does not exceed PRG

- Turtle Grass (Thalassia testudinum) patch, and feather algae (Caulerpa sertularioides) patch, naturally recruited.
- Qualitative macroinvertebrate survey conducted in this area
- Area of mangrove cover resulting from plantings and/or natural recruitment.

COC	PRG(mg\kg)
Zinc	410

Yellow highlighted values exceed the Preliminary Remedial Goal (PRG)



N W E S

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Figure 4
Sediment Zinc Sample Results
SWMU 6 Remedial Investigation Report – Addendum
Vieques, Puerto Rico

ch2m

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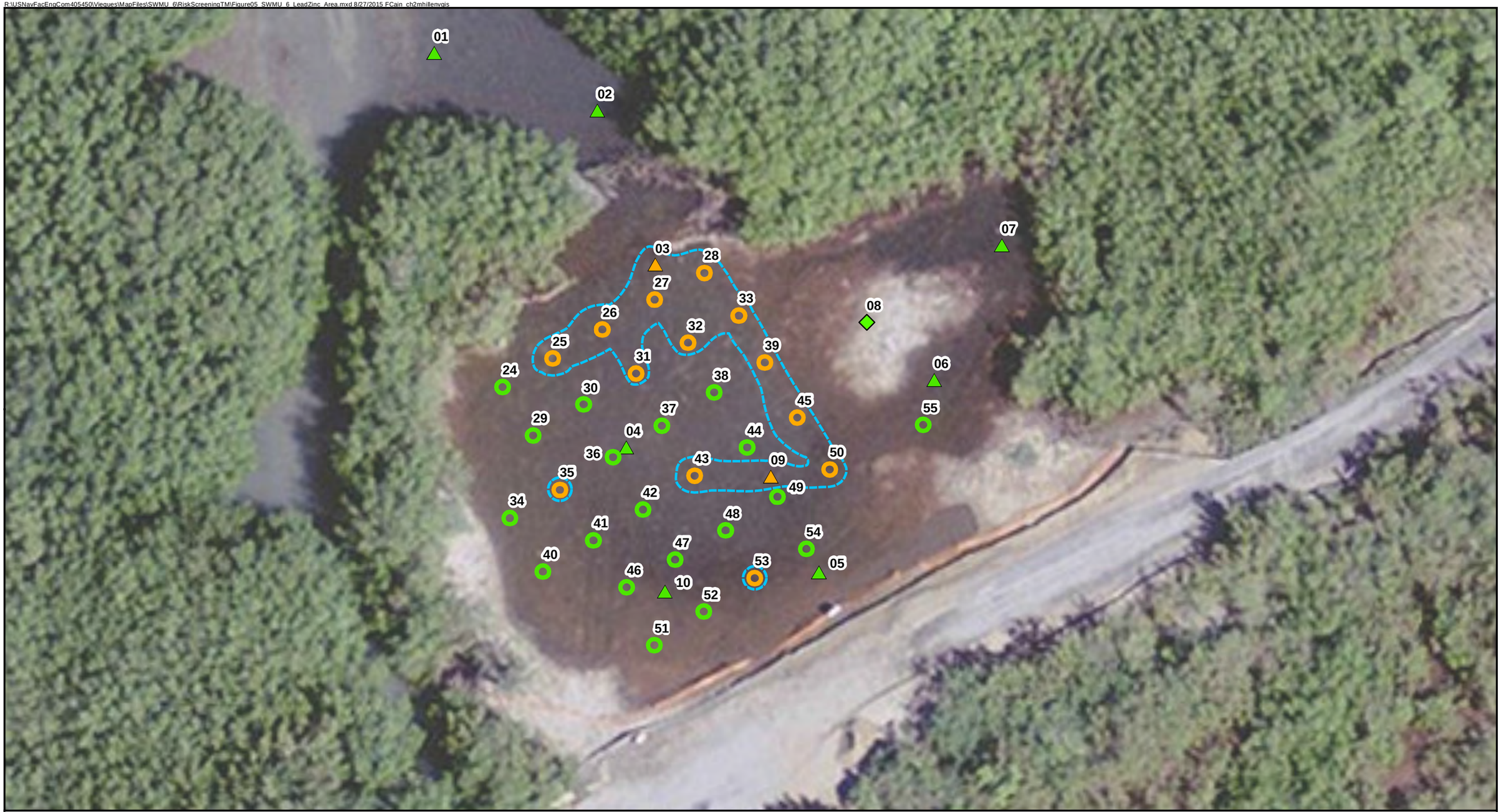

Approximate Area of Sediment Lead and Zinc PRG Exceedances

ExceedPRGZincLead

Does not exceed PRG Lead or Zinc

Exceeds PRG Lead or Zinc

Sediment Sample February 2011

Sediment does not exceed PRG Lead or Zinc

Sediment Exceeds PRG Lead or Zinc

Soil does not exceed PRG Lead or Zinc

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Feet

Figure 5
Approximate Area of Sediment Lead and Zinc Concentrations Above PRGs
SWMU 6 Remedial Investigation Report – Addendum
Vieques, Puerto Rico

ch2m

Appendix A
Sampling Photographs and Sediment Sample Boring Logs

FIGURE A-1
Drillers from Parratt-Wolff, Inc. using slide hammer to drive core barrel into sediment.

FIGURE A-2
Drillers from Parratt-Wolff, Inc. using wrenches to pull up core barrel with sediment sample.

FIGURE A-3
Acetate liners cut open showing sediment sample cores.

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD024 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 8/5/14

WEATHER: PARTLY CLOUDY / RAIN ~ 87°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb SLIDE HAMMER W/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 1315 8/5/14 END: 1400 8/5/14 LOGGER: R. FIGUEROA

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.25' SILT (SM), 5Y 2.5/1 (BLACK), VERY WET, COHESIVE NON PLASTIC, VERY LOOSE, SILT	1325 COLLECT SAMPLE VWW06-SD024-0006
					0.25'-1.3 SILTY SAND (SM), 5Y 2.5/1 (BLACK), WET COHESIVE, NON PLASTIC, MEDIUM DENSE, MEDIUM TO FINE GRAINED SAND WITH SILT WITH LITTLE (6-15%) MEDIUM TO LARGE SUBANGULAR GRAVEL	FD VWW06-SD024P-0006 @ 1330
1						
2					1.3-2.5' SANDY FAT CLAY (CH), 5Y 2.5/2 (BLACK), WET, COHESIVE, MEDIUM PLASTICITY, SOFT CLAY WITH FINE TO MEDIUM GRAINED SAND AND LITTLE (6-15%) FINE TO MEDIUM SHELL HASH.	1335 COLLECT SAMPLE VWW06-SD024-2430
3						
4	3-6.5'				2.5-3.7' SHELL HASH 5Y 7/3 (PALE YELLOW), WET NON COHESIVE, NON PLASTIC LOOSE, MEDIUM TO COARSE GRAINED SHELL HASH FINING DOWNWARD	1340 COLLECT SAMPLE VWW06-SD024-4854
5					3.7'-6.5 SILTY SAND (SM), 5Y 5/1 (GRAY), WET COHESIVE, NON PLASTIC, MEDIUM DENSE, VERY FINE TO FINE GRAINED SAND WITH SILT	
6						1345 COLLECT SAMPLE VWW06-SD024-7278
					TD: 6.5	

Sampler Signature: [signature] Date: 8/5/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD025 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT : **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION : **SWMU 6** DATE: 8/5/14

WEATHER: PARTLY CLOUDY / RAIN SHOWERS ≈ 87°F DRILLING CONTRACTOR : **Parratt–Wolff**

DRILLING METHOD AND EQUIPMENT USED : 50 lb SLIDE HAMMER W/4' GEOPROBE SAMPLER

WATER LEVELS : START : 1230 8/5/14 END : 1310 8/5/14 LOGGER : R. FIERRS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0 – 0.3 SILT (ML), 5Y 2.5/1 (BLACK), VERY WET, COHESIVE NON PLASTIC, VERY LOOSE, SILT	1250 COLLECT SAMPLE VWW06-SD025-0066
1					0.3 – 1.2 SILTY SAND (SM) WITH GRAVEL, 5Y 2.5/1 (BLACK), WET, COHESIVE, NON PLASTIC MEDIUM DENSE, MEDIUM TO FINE GRAINED SAND WITH SILT AND FEW MEDIUM TO LARGE SUB ANGULAR GRAVEL	∀ MS/MSD VWW06-SD025-0066-MS VWW06-SD025-0066-SD
2					1.2 – 2.2 SANDY FAT CLAY (CH), 5Y 2.5/2 (BLACK) WET, COHESIVE, MEDIUM PLASTICITY, SOFT CLAY WITH FINE TO MEDIUM GRAINED SAND AND LITTLE SHELL HASH (MEDIUM GRAINED).	1255 COLLECT SAMPLE VWW06-SD025-2430
3					2.2 – 4.1 SHELL HASH 5Y 7/3 (PALE YELLOW), WET NON COHESIVE, NON PLASTIC LOOSE, MEDIUM TO COARSE SIZE SHELL HASH, FINING DOWNWARD	
4	3'-6.5'				4.1 – 6.5' SILTY SAND (SM), 5Y 5/1 (GRAY), WET COHESIVE, NON PLASTIC, MEDIUM DENSE, VERY FINE TO FINE GRAINED SAND WITH SILT.	1300 COLLECT SAMPLE VWW06-SD025-4854
5						
6						1305 COLLECT SAMPLE VWW06-SD025-7278
					TD = 6.5'	

Sampler Signature: [signature] Date: 8/5/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD026 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: SWMU 6 Sediment Sampling, Vieques, PR LOCATION: SWMU 6 DATE: 8/5/14

WEATHER: PARTLY CLOUDY / SHOWERS / BREEZE ≈ 85°F DRILLING CONTRACTOR: Parratt-Wolff

DRILLING METHOD AND EQUIPMENT USED: 50 lb SLIDE HAMMER W/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 1100 8/5/14 END: 1225 8/5/14 LOGGER: R. FIGUERAS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.25' SILT (ML), ~~5Y 2.5/1~~ PF 5Y 2.5/1 (BLACK), VERY WET, COHESIVE, NON PLASTIC, VERY LOOSE SILT	1205 COLLECT SAMPLE VWW06-SD026-0006
1					0.25-1.3' SILTY SAND (SM) 5Y 2.5/1 (BLACK), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE, MEDIUM TO FINE GRAINED SAND WITH SILT WITH LITTLE (6-15%) MEDIUM SUBROUNDED GRAVEL	
2					1.3-2.5' SANDY FAT CLAY (CH), 5Y 2.5/2 (BLACK) WET COHESIVE, MEDIUM PLASTICITY, SOFT, CLAY WITH FINE TO MEDIUM GRAINED SAND	1210 COLLECT SAMPLE VWW06-SD026-2430
3						+ FD VWW06-SD026P-2430 @ 1215
	3-6.5'				2.5-4.5' SHELL HASH 5Y 7/3 (PALE YELLOW), WET NON COHESIVE, NON PLASTIC LOOSE, MEDIUM TO COARSE GRAINED SHELL HASH, FINING DOWNWARD	
4						1220 COLLECT SAMPLE VWW06-SD026-4854
5					4.5-6.5 SILTY SAND (SM) 5Y 5/1 (GRAY), WET, COHESIVE NON PLASTIC, MEDIUM DENSE VERY FINE TO FINE GRAINED SAND WITH SILT	
6						1225 COLLECT SAMPLE VWW06-SD026-7278
					TD = 6.5	

Sampler Signature: [signature] Date: 8/5/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD027 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 8/5/14

WEATHER: Partly Cloudy ≈ 86°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 1010 8/5/14 END: 1050 8/5/14 LOGGER: R. FIGUERAS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.25' SILT (ML) 5Y 2.5/1 (BLACK), VERY WET, COHESIVE, NON PLASTIC, VERY LOOSE, SILT	1025 COLLECT SAMPLE VWW06-SD027-0006
1					0.25'-1' SILTY SAND (SM) 5Y 2.5/1 (BLACK), WET, COHESIVE NONPLASTIC, MEDIUM DENSE MEDIUM TO FINE GRAINED SAND WITH SILT WITH LITTLE (6-15%) SMALL TO MEDIUM SUBROUNDED GRAVEL	
2					1-2.3' SANDY FAT CLAY (CH), 5Y 2.5/2 (BLACK), WET COHESIVE, MEDIUM PLASTICITY SOFT, CLAY WITH FINE TO MEDIUM GRAINED SAND.	1030 COLLECT SAMPLE VWW06-SD027-2430
3					2.3-3.9 SHELL HASH 5Y 7/3 (PALE YELLOW), WET NON COHESIVE, NON PLASTIC LOOSE, MEDIUM TO COARSE GRAINED SHELL HASH, FINING DOWNWARD	+ MS/MSD VWW06-SD027-2430-MS VWW06-SD027-2430-SD
4	3-6.5'				3.9-6.5' SILTY SAND (SM) 5Y 5/1 (GRAY), WET, COHESIVE NON PLASTIC, MEDIUM DENSE VERY FINE TO FINE GRAINED SAND WITH SILT	1035 COLLECT SAMPLE VWW06-SD027-4854
5						
6						1040 COLLECT SAMPLE VWW06-SD027-7278
					TD=6.5'	

Sampler Signature: [signature] Date: 8/5/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD028 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 8/5/14

WEATHER: Partly Cloudy / Breezy ≈ 85°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb Slide Hammer w/ 4' Geoprobe Sampler

WATER LEVELS: START: 0930 END: 1000 LOGGER: R. Fields

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.25' SILT (ML), 5Y 2.5/1 (BLACK), VERY WET, COHESIVE, NON PLASTIC, VERY LOOSE, SILT	0940 COLLECT SAMPLE VWW06-SD028-0006
1					0.25-1.6' SILTY SAND (SM) 5Y 2.5/1 (BLACK), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE, MEDIUM TO FINE GRAINED SAND w/ SILT TRACE SMALL SUBROUNDED GRAVEL.	
2					1.6-2.2' SANDY FAT CLAY (CH) 5Y 2.5/2 (BLACK), WET, COHESIVE, MEDIUM PLASTIC, SOFT, CLAY WITH FINE TO MEDIUM GRAINED SAND	0945 COLLECT SAMPLE VWW06-SD028-2430
						~~MS/MSD~~ FD VWW06-SD02BP-2430 @ 0950
3					2.2-4.3' SHELL HASH 5Y 7/3 (PALE YELLOW), WET NON COHESIVE, NON PLASTIC LOOSE, MEDIUM TO COARSE-GRAINED SHELL HASH	
4	3-6.5'					0955 ~~0950~~ COLLECT SAMPLE VWW06-SD028-4854
					4.3-6.5 SILTY SAND (SM) 5Y 6/1 (GRAY), WET, COHESIVE NON PLASTIC, MEDIUM DENSE VERY FINE TO FINE GRAINED SAND w/ SILT	
5						
6	RK 8/5/14					1000 ~~0955~~ COLLECT SAMPLE VWW06-SD028-7278
					TD = 6.5'	

Sampler Signature: [signature] Date: 8/5/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD029 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT : **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION : **SWMU 6** DATE: 8/4/14

WEATHER: PARTLY CLOUDY / WINDY / RAIN ~84°F DRILLING CONTRACTOR : **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED : 50 lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS : START : 0915 8/4/14 END : 1015 8/4/14 LOGGER : R. FIGUAS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.25 SILT (ML), 5Y 2.5/1 (BLACK), VERY WET, COHESIVE NON PLASTIC, VERY LOOSE, SILT	0935 COLLECT SAMPLE VWW06-SD029-0006
1					0.25-1.5 SILTY SAND (SM) SHELL HASH, 5Y 4/2 (OLIVE GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND w/ MEDIUM TO COARSE SHELL HASH	
2					1.5-3' SHELL HASH 5Y 7/3 (PALE YELLOW), WET, NON COHESIVE, NON PLASTIC, LOOSE, COARSE SHELL HASH	0940 COLLECT SAMPLE VWW06-SD029-2430
3						
4	3-6.5'				3-4.8' SILTY SAND (SM) 5Y 7/3 (PALE YELLOW), WET COHESIVE, NON PLASTIC, DENSE, FINE TO MEDIUM GRAINED SAND	0945 COLLECT SAMPLE VWW06-SD029-4854
						+ MS/MSD VWW06-SD029-4854-MS VWW06-SD029-4854-SD
5					4.8-6.5' SILTY SAND (SM) 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND WITH LITTLE (6 TO 15%) SHELL HASH.	
6						0950 COLLECT SAMPLE VWW06-SD029-7278
					TD: 6.5'	

Sampler Signature: [signature] Date: 8/4/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD030 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 8/4/14

WEATHER: Partly Cloudy / Windy = 85°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb Slide Hammer w/ 4' Geoprobe Sampler

WATER LEVELS: START: 1030 8/4/14 END: 1130 8/4/14 LOGGER: R. Fields

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.3 Silt (ML), 5Y 2.5/1 (Black) very wet, cohesive, non plastic, very loose silt	1040 Collect sample VWW06-SD030-0006
1					0.3-1.3' Silty sand (SM) with shell hash, 5Y 4/2 (olive gray), wet, cohesive, non plastic medium dense, fine to medium grained sand, with medium to coarse shell hash	
2					1.3-3' Shell hash, 5Y 7/3 (pale yellow), wet, non-cohesive, non plastic, loose coarse shell hash with whole shells.	1045 Collect sample VWW06-SD030-2430
3						
4	3-6.5'				3'-6.5' Silty sand (SM) 5Y 5/1 (gray), wet, cohesive, non plastic, dense, fine to very fine grained sand with some (31-49%) silt	1050 Collect sample VWW06-SD030-4854
5						~~1055~~ 1100 Collect sample VWW06-SD030-7278
6					TD = 6.5'	

Sampler Signature: [signature] Date: 8/4/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD031 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT : SWMU 6 Sediment Sampling, Vieques, PR LOCATION : SWMU 6 DATE: 8/4/14

WEATHER: PARTLY CLOUDY/SUNNY/WINDY ~85°F DRILLING CONTRACTOR : Parratt-Wolff

DRILLING METHOD AND EQUIPMENT USED : 50 lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS : START : 1145 8/4/14 END : 1245 8/4/14 LOGGER : R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.3' SILT (ML), 5Y 2.5/1 (BLACK), VERY WET, COHESIVE, NON PLASTIC, VERY LOOSE, SILT	1205 COLLECT SAMPLE VWW06-SD031-0006
1					0.3-1.2' SANDY FAT CLAY (CH), 5Y 3/2 (DARK OLIVE GRAY), WET, COHESIVE, MEDIUM PLASTICITY, SOFT, CLAY WITH FINE TO MEDIUM GRAINED SAND AND FEW (1%-30%) COARSE GRAINED SHELL HASH	
2					1.2-3' SHELL HASH, 5Y 7/3 (PALE YELLOW), WET, NON COHESIVE, NON PLASTIC, LOOSE, COARSE SHELL HASH WITH WHOLE SHELLS.	1210 COLLECT SAMPLE VWW06-SD031-2430
3						
4	3-6.5'				3'-5.2 SILTY SAND (SM) 5Y 6/2 (LIGHT OLIVE GRAY), WET, COHESIVE, NON PLASTIC, DENSE, FINE TO MEDIUM GRAINED SAND w/SILT	1215 COLLECT SAMPLE VWW06-SD031-4854
5						
6					5.2-6.5' POORLY GRADED SAND (SP), 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, VERY DENSE, VERY FINE GRAINED SAND.	1220 COLLECT SAMPLE VWW06-SD031-7278 + MS/MSD
					TD=6.5'	VWW06-SD031-7278-MS VWW06-SD031-7278-SD

Sampler Signature: [signature] Date: 8/4/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD032 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: SWMU 6 Sediment Sampling, Vieques, PR LOCATION: SWMU 6 DATE: 8/4/14

WEATHER: WINDY / PARTLY CLOUDY ~85°F DRILLING CONTRACTOR: Parratt-Wolff

DRILLING METHOD AND EQUIPMENT USED: 50lb SLIDE HAMMER W/4' GEOPROBE SAMPLER

WATER LEVELS: START: 1300 8/4/14 END: 1400 8/4/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.3' SILT (ML), 5Y 2.5/1 (BLACK), VERY WET, COHESIVE NON PLASTIC, VERY LOOSE, SILT	1315 COLLECT SAMPLE VWW06-SD032-0006
1					0.3-0.8' SANDY FAT CLAY (CH), 5Y 3/2 (DARK OLIVE GRAY), WET, COHESIVE MEDIUM TO HIGH PLASTICITY, SOFT CLAY W/FINE TO MEDIUM GRAINED SAND AND FEW COARSE GRAINED SHELL HASH, WOOD ORGANIC MATERIAL.	
2					0.8-2.1 SILTY SAND (SM) W/SHELL HASH 5Y 7/3 (PALE YELLOW), WET, COHESIVE, NON PLASTIC MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND WITH MEDIUM GRAINED SHELL HASH	1320 COLLECT SAMPLE VWW06-SD032-2430
3	3-6.5'				2.1-3' SAME AS ABOVE SHELL HASH COARSENING DOWNWARD.	
4					3-4.3' SILTY SAND (SM) 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND	1325 COLLECT SAMPLE VWW06-SD032-2854
5						1330 VWW06-SD032P-2854
6					4.3-5.5' SHELL HASH 5Y 7/3 (PALE YELLOW), WET, NON COHESIVE, NON PLASTIC, LOOSE MEDIUM TO VERY COARSE GRAINED SHELL HASH	1335 COLLECT SAMPLE VWW06-SD032-7278
			TD=	6.5'	5.5-6.5' POORLY GRADED SAND (SP), 5Y 5/1 (GRAY) WET, COHESIVE, NON PLASTIC, DENSE, VERY FINE GRAINED SAND. TD=6.5'	

Sampler Signature: [signature] Date: 8/4/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD033 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 8/5/14

WEATHER: Partly Cloudy ~ 84°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb Slide Hammer w/4' Geoprobe Sampler

WATER LEVELS: START: 0845 END: 0925 LOGGER: R. Fords

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3				0-0.25' SILT (ml), 5Y 2.5/1 (Black), very wet, cohesive, non plastic, very loose, silt	0905 Collect Sample VWW06-SD033-0006
1					0.25'-1.4' Sandy Fat Clay (CH), 5Y 3/2 (Dark Olive Gray), wet, cohesive, medium plasticity, soft, clay with fine to medium grained sand organic material.	
2					1.4-3.5 Silty Sand (SM) w/ Shell Hash, 5Y 6/2 (Light Olive Gray), wet, cohesive, non plastic, medium dense, fine to medium grained sand w/ coarse shell hash; trace small subrounded gravel	0910 Collect Sample VWW06-SD033-2430
3						
4	3-6.5'				3.5-6.5' Silty Sand (SM), 5Y 6/1 (Gray), wet cohesive, non plastic, medium dense, very fine to fine grained sand w/ silt; trace medium grained shell hash	0915 Collect Sample VWW06-SD033-4854
5						
6						0920 Collect Sample VWW06-SD033-7278
					TD=6.5	

Sampler Signature: [signature] Date: 8/5/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD034 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 8/1/14

WEATHER: PARTLY CLOUDY / WINDY ≈88°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50lb SLIDE HAMMER W/4' GEOPROBE SAMPLER

WATER LEVELS: START: 1025 END: 1130 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
1	0-3'				0-0.5 SILT (ML), 5Y 2.5/1 (BLACK) VERY WET, COHESIVE NON PLASTIC, VERY LOOSE SILT	1030 COLLECT SAMPLE VWW06-SD034-0006
2					0.5-3' FAT CLAY (CH) W/SHELL HASH, 5Y 3/1 (VERY DARK GRAY), WET COHESIVE, MEDIUM PLASTICITY SOFT, FAT CLAY WITH COARSE SIZE SHELL HASH/FRAGMENTS	1035 COLLECT SAMPLE VWW06-SD034-2430
3					3'-3.8' SHELL HASH 5Y 7/3 (PALE YELLOW), WET NON COHESIVE, NON PLASTIC LOOSE MEDIUM TO VERY COARSE SIZE SHELL HASH WITH SHELL FRAGMENTS	
4	3-6.5'				3.8-6.2 SAND (SP) W/SHELL HASH 5Y 6/2 (LIGHT OLIVE GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE FINE GRAINED SAND WITH MEDIUM SIZE SHELL HASH	1040 COLLECT SAMPLE VWW06-SD034-4854
5						
6					6.2-6.5' SAND (SP) 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, DENSE VERY FINE SAND.	1045 COLLECT SAMPLE VWW06-SD034-7278

Sampler Signature: [signature] Date: 8/1/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD035- SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: SWMU 6 Sediment Sampling, Vieques, PR LOCATION: SWMU 6 DATE: 8/1/14

WEATHER: PARTLY CLOUDY/SUNNY WINDY ≈86°F DRILLING CONTRACTOR: Parratt-Wolff

DRILLING METHOD AND EQUIPMENT USED: 50lb SLIDE HAMMER W/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 0930 8/1/14 END: 1010 8/1/14 LOGGER: R. FIGUERAS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0.3'				0-0.3 SILT (ML), 5Y2.5/1 (BLACK), VERY WET, COHESIVE NON PLASTIC, VERY LOOSE SILT	0935 COLLECT SAMPLE VWW06-SD035-0006
1					0.3 - 3.5' FAT CLAY (CH) W/SHELL HASH (CH) 5Y 3/1 (VERY DARK GRAY), WET, COHESIVE, MEDIUM PLASTICITY, SOFT, FAT CLAY WITH MEDIUM TO COARSE SHELL HASH	FD @ 0940 VWW06-SD035P-0006
2						0945 COLLECT SAMPLE VWW06-SD035-2430
3						
4					3.5 - 4.8' SILTY SAND (SM) W/SHELL HASH, ~~WET~~ 5Y 5/1, (GRAY), WET COHESIVE, NON PLASTIC, FINE TO MEDIUM GRAINED SAND, SHELL HASH COARSENING DOWNWARD	0950 COLLECT SAMPLE VWW06-SD035-4854
5					4.8 - 6' SILTY SAND (SM) 5Y5/1, (GRAY), WET, COHESIVE, NON PLASTIC, FINE TO MEDIUM ~~GRAINED~~ SAND. MEDIUM DENSITY	
6					6-6.5' POORLY GRADED SAND (SP), 5Y 5/1 (GRAY) WET, COHESIVE, NON PLASTIC DENSE, VERY FINE SAND	0955 COLLECT SAMPLE VWW06-SD035-7278

Sampler Signature: [signature] Date: 8/1/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD036 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 8/1/14

WEATHER: Partly Cloudy/Sunny ~ 85°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 0840 END: 0925 LOGGER: R. FIGUAS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.4' SILT (ML) 5Y 2.5/1 (BLACK), VERY WET, COHESIVE, NON PLASTIC VERY LOOSE, SILT	0840 COLLECT SAMPLE VWW06-SD036-0000
1					0.4 – 3' SILTY SAND w/ SHELL HASH (SM), 5Y 5/2 (OLIVE GRAY), WET, COHESIVE, NON PLASTIC, LOOSE, FINE TO MEDIUM GRAINED SAND WITH MEDIUM TO COARSE SHELL HASH. SHELL HASH COARSENING DOWNWARD	
2						0845 COLLECT SAMPLE VWW06-SD036-2430
						+ MS/MSD VWW06-SD036-2430-MS VWW06-SD036-2430-SD
3						
	3'-6.5'				3-6.5' POORLY GRADED SAND (SP), 5Y 7/1 (LIGHT GRAY) WET, COHESIVE, NON PLASTIC DENSE, VERY FINE SAND	
4						0850 COLLECT SAMPLE VWW06-SD036-4854
5						
6						0855 COLLECT SAMPLE VWW06-SD036-7278
					TD = 6.5'	

Sampler Signature: [signature] Date: 8/1/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD037 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/31/14

WEATHER: SUNNY / PARTLY CLOUDY = 89°F WINDY DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb SLIDE HAMMER W/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 1215 7/31/14 END: 1330 7/31/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0.3'				0-0.5' SILT W/ SAND 5Y 2.5/1 (BLACK), VERY WET, COHESIVE, NONPLASTIC, VERY LOOSE, SILT WITH MEDIUM-GRAINED SAND	1220 COLLECT SAMPLE VWW06-SD037-0006 RF
1					0.5-1' SILTY SAND (SM) W/ SHELL HASH, 5Y 3/2 (DARK OLIVE GRAY), WET, COHESIVE NON PLASTIC, LOOSE, FINE TO MEDIUM GRAINED SAND WITH MEDIUM SIZE SHELL HASH	
2					1-3.2' SILTY SAND (SM) 5Y 4/1 (VERY DARK GRAY), WET COHESIVE, NON PLASTIC, MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND WITH LITTLE (6-15%) SHELL HASH.	1225 COLLECT SAMPLE VWW06-SD037-2430
3						+ MS/MSD VWW06-SD037-2430-MS VWW06-SD037-2430-SD
4					3.2-5' POORLY GRADED SAND (SP) 5Y 5/2 (OLIVE GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE, VERY FINE TO FINE GRAINED SAND	1230 COLLECT SAMPLE VWW06-SD037-4854
5					5-6' SHELL HASH W/ SAND 5Y 6/2 (LIGHT OLIVE GRAY), WET, COHESIVE, NON PLASTIC, LOOSE, MEDIUM TO COARSE SIZE SHELL HASH WITH FINE TO MEDIUM GRAINED SAND	
6					6-6.5' SAND (SP), 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE, VERY FINE SAND. TD = 6.5'	1235 COLLECT SAMPLE VWW06-SD037-7274
6.5						+ FD VWW06-SD037F-7274

Sampler Signature: [signature] Date: 7/31/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD038 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/31/14

WEATHER: PARTLY CLOUDY / SUNNY = 90°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 1645 7/31/14 END: 1115 7/31/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
1	0-3'				0-0.2' SILT (ML), 5Y 2.5/1 (BLACK), VERY WET, COHESIVE, NON PLASTIC, VERY LOOSE, SILT 0.2-3' SILTY SAND (SM) w/ SHELL HASH 5Y 5/2 (OLIVE GRAY), WET, COHESIVE, NON PLASTIC, FINE TO MEDIUM GRAINED SAND WITH MEDIUM SIZE SHELL HASH COARSENING DOWNWARD NOTE: ORGANIC WOOD PIECES	1050 COLLECT SAMPLE VWW06-SD038-0006
2						1055 COLLECT SAMPLE VWW06-SD038-2436
3					3-3.6 SAND (SP) 5Y 6/2 (OLIVE GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE, VERY FINE SAND	
4	3'-6.5'				3.6-5.2' SAND (SW) w/ SHELL HASH, 5Y 6/2 (LIGHT OLIVE GRAY), WET, COHESIVE, NON PLASTIC, LOOSE, WELL GRADED SAND FINE TO COARSE WITH MEDIUM TO COARSE SHELL HASH.	1100 COLLECT SAMPLE VWW06-SD038-4854
5						
6					5.2-6.5' POORLY GRADED SAND (SP), 5Y 5/1 (GRAY) WET, COHESIVE, NON PLASTIC, DENSE, VERY FINE SAND.	1105 COLLECT SAMPLE VWW06-SD038-7278
					TD = 6.5'	

Sampler Signature: [signature] Date: 7/31/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD039 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/31/14

WEATHER: Sunny / Partly Cloudy / Hot ≈ 90°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50lb SLIDE HAMMER w/4' GEOPROBE SAMPLER

WATER LEVELS: START: 1000 7/31/14 END: 1040 7/31/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.25' SILT (ML), 5Y 2.5/1 (BLACK), VERY WET, COHESIVE NON PLASTIC, VERY LOOSE, SILT	1000 COLLECT SAMPLE VWW06-SD039-0006
1					0.25-1' SHELL HASH w/SAND 5Y 4/1 (DARK GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE, COARSE TO MEDIUM GRAINED SHELL HASH WITH MEDIUM GRAINED SAND	
2					1-2.4' SILTY SAND (SM) w/SHELL HASH, 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, FINE TO MEDIUM SAND WITH FINE TO MEDIUM SHELL HASH	1005 COLLECT SAMPLE VWW06-SD039-2430
3					2.4-3.6 SHELL HASH w/ SAND, 5Y 6/1 (GRAY), WET COHESIVE, NON PLASTIC, MEDIUM- TO COARSE SHELL HASH WITH FINE TO MEDIUM SAND	
	3-6.5'				3.6-4.2' SAND (SP), 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE VERY FINE GRAINED SAND	
4					4.2-6.1' SAND (SP) w/ SHELL HASH, 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC MEDIUM DENSE, VERY FINE SAND WITH FEW (16-30%) SHELL HASH.	1010 COLLECT SAMPLE VWW06-SD039-4854
5						
6					6.1-6.5 SAND (SP), 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC DENSE, VERY FINE SAND	1015 COLLECT SAMPLE VWW06-SD039-7278
					TD: 6.5'	

Sampler Signature: [signature] Date: 7/31/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD0440 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/30/14

WEATHER: PARTLY CLOUDY ≈ 85°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 0930 7/30/14 END: 1010 7/30/14 LOGGER: R. FIGUERAS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.25' SILT (ML), GLEY 1 2.5/N (BLACK), VERY WET, NON COHESIVE, LOOSE NON PLASTIC, SILT	0945 COLLECT SAMPLE VWW06-SD0440-0006
1					0.25-2.4 SILTY SAND (SM) 5Y 4/1 (DARK GRAY), WET, COHESIVE, NON PLASTIC MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND WITH LITTLE (6 TO 15%) SHELL HASH	
2						0950 COLLECT SAMPLE VWW06-SD0440-2430
3					2.4-5.5' SAME AS ABOVE, HOWEVER, SHELL HASH COARSENING DOWNWARD AND MORE ABUNDANT	
4						0955 COLLECT SAMPLE VWW06-SD0440-4854
5						
6					5.5-6.5' SAND (SP). 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC VERY FINE SAND.	1000 COLLECT SAMPLE VWW06-SD0440-7278
					TD = 6.5' BGS	

Sampler Signature: [signature] Date: 7/30/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWNØ6-SDØ41 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT : **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION : **SWMU 6** DATE: 7/30/14

WEATHER: SUNNY/PARTLY CLOUDY / ≈87°F DRILLING CONTRACTOR : **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS : START : 1010 7/30/14 END : 1115 7/30/14 LOGGER : R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.5' SILT (ML), GLEY 1 2.5/N (BLACK), VERY WET, NON COHESIVE, NON PLASTIC, VERY LOOSE	1030 COLLECT SAMPLE VWNØ6-SDØ41-ØØØ6
1					0.5-3.5' SILTY SAND (SM) w/ SHELL HASH 5Y 4/1 (DARK GRAY), WET NON COHESIVE, NON PLASTIC, MEDIUM DENSE FINE TO MEDIUM GRAINED SAND WITH MEDIUM TO COARSE SHELL HASH COARSENING DOWNWARD	
2						1035 COLLECT SAMPLE VWNØ6-SDØ41-2430
3						
	3-6.5'				3.5-5.4' SHELL HASH w/ SAND, 5Y 6/2 (LIGHT OLIVE GRAY), WET, NON COHESIVE, NON PLASTIC, LOOSE, VERY COARSE SHELL HASH WITH LITTLE (6 TO 15%) FINE SAND	
4						1040 COLLECT SAMPLE VWNØ6-SDØ41-4854
5						
6					5.4-6.5' SAND (SP) 5Y 5/1 (GRAY), WET COHESIVE, NON PLASTIC, VERY FINE SAND	1045 COLLECT SAMPLE VWNØ6-SDØ41-7278
					TD = 6.5' bls	+ MS/MSD VWNØ6-SDØ41-7278-MS VWNØ6-SDØ41-7278-SD

Sampler Signature: [signature] Date: 7/30/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD042 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/30/14

WEATHER: SUNNY / PARTLY CLOUDY = 89°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 1215 7/30/14 END: 1300 7/30/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.25' SILT w/ SAND (ML) 5Y 2.5/1 (BLACK), VERY WET NON COHESIVE, NON PLASTIC, VERY LOOSE, SILT WITH FINE GRAINED SAND	1230 COLLECT SAMPLE VWW06-SD042-0006
1					0.25-2.5' SILTY SAND (ML) 5Y5/1 (GRAY), WET, COHESIVE NON PLASTIC, MEDIUM DENSITY, FINE TO MEDIUM GRAINED SAND WITH TRACE ~~<5%~~ RF (<5%) SHELL HASH	
2						1235 COLLECT SAMPLE VWW06-SD042-2430
					2.5'-5.9' SHELL HASH w/ SAND, 5Y 8/2 (PALE YELLOW), WET, LOOSE, NON COHESIVE, NON PLASTIC, LOOSE, COARSE GRAINED SHELL HASH WITH MEDIUM TO COARSE SAND, SHELL HASH COARSENING DOWNWARD.	1240 COLLECT FIELD DUP VWW06-SD042P-2430
3						
	3-6.5'					
4						1245 COLLECT SAMPLE VWW06-SD042-4854
5						
6					5.9-6.5' SAND (SP), 5Y5/1 (GRAY), WET, COHESIVE, NON PLASTIC, VERY FINE SAND	1250 COLLECT SAMPLE VWW06-SD042-7278
					TD 6.5'	

Sampler Signature: [signature] Date: 7/30/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW Ø6-SDØ43 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/30/14

WEATHER: SUNNY / PARTLY CLOUDY ~90°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb SLIDE HAMMER W/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 1305 7/30/14 END: 1345 7/30/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
					0-0.4' SILT W/SAND (ML) 5Y 2.5/1 (BLACK), VERY WET, NON COHESIVE NONPLASTIC, VERY LOOSE SILT TO VERY FINE SAND	1305 COLLECT SAMPLE VWWØ6-SDØ43-ØØØ6
1	0-3'				~~Dark~~ 0.4-2.2' SILTY SAND (SM) 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND, WITH TRACE <5% SHELL HASH	
2						1310 COLLECT SAMPLE VWWØ6-SDØ43-2430
					2.2-6' SHELL HASH W/SAND 5Y 8/2 (PALE YELLOW), WET, NON COHESIVE, NON PLASTIC, LOOSE. COARSE TO VERY COARSE SHELL HASH WITH MEDIUM TO COARSE SAND SHELL HASH COARSENING DOWN-WARD	
3						
4	3-6.5'					1315 COLLECT SAMPLE VWWØ6-SDØ43-4854
5						
6					6-6.5' SILTY SAND (SM) 5Y 5/1 (GRAY), WET, COHESIVE NON PLASTIC, DENSE, FINE TO MEDIUM GRAINED SAND WITH LITTLE (6 TO 15%) SHELL HASH (MEDIUM GRAINED)	1320 COLLECT SAMPLE VWWØ6-SDØ43-7278 TD=6.5'

Sampler Signature: [signature] Date: 7/30/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD044 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/31/14

WEATHER: SUNNY / HOT / HUMID ~ 85°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 0820 7/31/14 END: 0915 7/31/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.2' - SILT W/SAND (ML) 5Y 2.5/1 (BLACK), VERY WET NON COHESIVE, NON PLASTIC VERY LOOSE, SILT WITH FINE SAND.	0835 COLLECT SAMPLE VWW06-SD044-0006
1					0.2-2.5' SILTY SAND (SM) 5Y 4/1 (DARK GRAY), WET COHESIVE, NON PLASTIC, MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND WITH LITTLE (6-15%) MEDIUM GRAINED SHELL HASH	
2						0840 COLLECT SAMPLE VWW06-SD044-2430
					2.5-6.2' SHELL HASH W/ SAND, 5Y 7/1 (LIGHT GRAY) WET, NON COHESIVE, NON PLASTIC, LOOSE, MEDIUM TO COARSE GRAINED SHELL HASH WITH LITTLE FINE TO MEDIUM GRAINED SAND (6-15%).	+ MS/MSD VWW06-SD044-2430-MS VWW06-SD044-2430-SD
3						
4	3-6.5'					0845 COLLECT SAMPLE VWW06-SD044-4854
5						
6						0850 COLLECT SAMPLE VWW06-SD044-7278
					6.2-6.5' SAND (SP), 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE, VERY FINE SAND W/ LITTLE COARSE SHELL HASH (6-15%)	

Sampler Signature: [signature] Date: 7/31/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD0~~44~~45 RF 7/31/14	SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/31/14

WEATHER: Sunny / Partly Cloudy Hot ~87°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 0920 7/31/14 END: 0950 7/31/14 LOGGER: R. Fields

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.5' SALT (ML), 5Y 2.5/1 (BLACK), VERY WET, COHESIVE, NON PLASTIC, VERY SOFT, SALT	0925 COLLECT SAMPLE VWW06-SD0045-0006
1					0.5-1.5' SILTY SAND (SM) 5Y 6/1 (GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE FINE TO MEDIUM GRAINED SAND WITH LITTLE (6-15%) MEDIUM TO FINE SHELL HASH.	
2					1.5'-3.6' SHELL HASH W/SAND 5Y 8/2 (PALE YELLOW), WET NON COHESIVE, NON PLASTIC, LOOSE, COARSE TO VERY COARSE SHELL HAS WITH MEDIUM TO COARSE GRAINED SAND.	0930 COLLECT SAMPLE VWW06-SD0045-2430
3						
4					3.6-4.3' SILTY SAND (SM) 5Y 7/2 (LIGHT GRAY), WET COHESIVE, NON PLASTIC, MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND WITH SILT	0935 COLLECT SAMPLE VWW06-SD0045-2854
5					4.3-5.3' SHELL HASH W/SAND 5Y 7/1 (LIGHT GRAY) WET NON COHESIVE, NON PLASTIC LOOSE, MEDIUM TO COARSE SHELL HASH WITH MEDIUM GRAINED SAND	
6					5.3-6' SILTY SAND (SM) W/ SHELL HASH 5Y 5/1 (GRAY), WET COHESIVE, NON PLASTIC, MEDIUM DENSE FINE TO MEDIUM GRAINED SAND W/ COARSE SHELL HASH	
					6-6.5' SAND (SP) 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, DENSE, VERY FINE SAND	0940 COLLECT SAMPLE VWW06-SD0045-7278
					TD: 6.5'	

Sampler Signature: [signature] Date: 7/31/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD046 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/29/14

WEATHER: PARTLY CLOUDY & 85°F DRILLING CONTRACTOR: **Parratt–Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 0815 7/29/14 END: 0915 7/29/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.5 SILT (ML), GLEY 1 2.5/N (GREENISH BLACK) WET, NON COHESIVE, NO PLASTIC VERY SOFT. SILT WITH TRACE TO LITTLE FINE GRAINED SAND	0830 COLLECT SAMPLE VWW06-SD046-0000
1					0.5-2.4' SILTY SAND (SM) w/ SHELL HASH, 5Y 6/2 (LIGHT OLIVE GRAY), WET, NO PLASTIC, NON COHESIVE, LOOSE, FINE TO MEDIUM GRAINED SAND w/ SILT AND COARSE GRAINED SHELL HASH (FEW)	
2						0835 COLLECT SAMPLE VWW06-SD046-2430
					2.4-5.1' VERY COARSE GRAINED SHELL HASH w/ SAND, WET, NON COHESIVE, NO PLASTIC, LOOSE VERY COARSE SHELL HASH WITH LITTLE FINE TO MEDIUM GRAINED SAND. 5Y 8/2 (PALE YELLOW) TO 5Y 5/1 (GRAY)	
3						
	3-6.5'					
4						0840 COLLECT SAMPLE VWW06-SD046-4854
						0845 FIELD DUPLICATE VWW06-SD046P-4854
5						
					5.1-6' SAME AS ABOVE WITH SHELL HASH COARSENING DOWNWARD VERY SMALL SHELLS PRESENT	
6						
					6-6.5' SAND (SP) 5Y 5/1, (GRAY), WET, COHESIVE NON PLASTIC, VERY DENSE, VERY FINE SAND. TD = 6.5'	0850 COLLECT SAMPLE VWW06-SD046-7278

Sampler Signature: [signature] Date: 7/29/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD047 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/29/14

WEATHER: PARTLY CLOUDY ~87°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50lb SLIDE HAMMER W/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 0925 7/29/14 END: 1005 7/29/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0 - 0.8' SILT (ML), (GLEY 1 2.5/N) (GREENISH BLACK). WET, NON COHESIVE, NON PLASTIC VERY SOFT, SILT WITH TRACE TO LITTLE FINE GRAINED SAND	0930 COLLECT SAMPLE VWW06-SD047-0006
1					0.8 - 2.5' SILTY SAND (ML) W/SHELL HASH, 5Y5/2 (OLIVE GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND W/SILT & FINE TO MEDIUM SHELL HASH, PIECE OF WOOD PRESENT.	
2						0935 COLLECT SAMPLE VWW06-SD047-2430
					2.5 - 6' SHELL HASH W/SAND 5Y6/2 (LIGHT OLIVE GRAY), WET, NON COHESIVE	
3					NON PLASTIC, LOOSE. COARSE TO VERY COURSE SHELL HASH WITH FINE TO MEDIUM GRAINED SAND	
	3-6.5'					
4						0940 COLLECT SAMPLE VWW06-SD047-4854
5						
6					6 - 6.5 SAND (SP) 5Y5/2 (OLIVE GRAY), WET COHESIVE, NON PLASTIC, VERY DENSE, VERY FINE SAND TD = 6.5' BLS	0945 COLLECT SAMPLE VWW06-SD047-7278

Sampler Signature: Date: 7/29/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD048 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT : **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION : **SWMU 6** DATE: 7/29/14

WEATHER: PARTLY CLOUDY ~ 88°F DRILLING CONTRACTOR : **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED : 50 lb SLIDE HAMMER W/ 4' GEOPROBE SAMPLER

WATER LEVELS : START : 1020 7/29/14 END : 1125 7/29/14 LOGGER : R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0 - 0.5' SILT (ML) GLEY 1 2.5/N, (GREENISH BLACK), WET, NON COHESIVE, NON PLASTIC VERY SOFT, SILT.	1025 COLLECT SAMPLE VWW06-SD048-0006
1					0.5'-2' SILTY SAND (SM) W/ SHELL HASH 5Y 5/2, (OLIVE GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND W/ SHELL HASH COARSENING DOWNWARD	
2					2 - 5.8 SHELL HASH W/ SAND 5Y 7/2, LIGHT GRAY, WET. NON COHESIVE, NON PLASTIC, LOOSE, COARSE SHELL HASH WITH FINE TO MEDIUM GRAINED SAND, ODOR (SULFUR). WITH TRACE SMALL TO LARGE SUBROUNDED GRAVEL. SHELL HASH COARSENING DOWNWARD TO VERY COARSE SHELL HASH WITH VERY SMALL SHELLS STILL IN TACT.	1030 COLLECT SAMPLE VWW06-SD048-2430
3						
4	3-6.5'					1035 COLLECT SAMPLE VWW06-SD048-4854
						1040 FIELD DUPLICATE VWW06-SD048P-4854
5						
6					5.8 - 6.5' SAND (SP), 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, VERY FINE SAND WITH TRACE SHELL HASH. VERY DENSE TD = 6.5'	1045 COLLECT SAMPLE VWW06-SD048-7278

Sampler Signature: [signature] Date: 7/29/14

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD049 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: SWMU 6 Sediment Sampling, Vieques, PR LOCATION: SWMU 6 DATE: 7/29/14

WEATHER: PARTLY CLOUDY/SUNNY - HOT ≈ 90°F DRILLING CONTRACTOR: Parratt-Wolff

DRILLING METHOD AND EQUIPMENT USED: 50lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 1230 7/29/10 END: 1310 7/29/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.5' SILT (ML), GLEY 1/2S (GREENISH BLACK) VERY WET, NON COHESIVE, NON PLASTIC, VERY LOOSE SILT	1235 COLLECT SAMPLE VWW06-SD049-0006
1					0.5'-1.8' SILTY SAND (SM) w/SHELL HASH, 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC MEDIUM DENSITY, FINE TO MEDIUM GRAINED SAND w/ SHELL HASH COARSENING DOWNWARD.	
2					1.8-2.0' VERY COARSE SHELL HASH	
					2-3' FAT CLAY w/SAND (CH) 5Y 5/2 (OLIVE GRAY), MOIST COHESIVE, MEDIUM PLASTICITY SOFT, CLAY w/VERY FINE GRAINED SAND	1240 COLLECT SAMPLE VWW06-SD049-2636
3					3-5.7' SHELL HASH w/ SAND, 5Y 6/2 (LIGHT OLIVE GRAY), WET, COHESIVE, NON PLASTIC, LOOSE, COARSE TO VERY COARSE SHELL HASH WITH MEDIUM TO COARSE GRAINED SAND SHELL HASH FINING DOWN-WARD.	
4	3-6.5'					1245 COLLECT SAMPLE VWW06-SD049-4854
5						
6					5.7-6.5' SAND (SP) 5Y 5/1 (GRAY), WET, COHESIVE NON PLASTIC, VERY DENSE VERY FINE SAND	1250 COLLECT SAMPLE VWW06-SD049-7278
					TD = 6.5'	

Sampler Signature: [signature] Date: 7/29/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD05 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT : **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION : **SWMU 6** DATE: 7/29/14

WEATHER: PARTLY CLOUDY / SUNNY ≈ 90°F DRILLING CONTRACTOR : **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED : 50lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS : START : 1320 7/29/14 END : 1400 7/29/14 LOGGER : R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-1.2 SILT (ML), GLEY1 2.5/N (GREENISH BLACK), VERY WET ~~NON~~ TO NON COHESIVE, NON-PLASTIC, VERY LOOSE SILT.	1330 COLLECT SAMPLE VWW06-SD05-0006
						1335 COLLECT FIELD DUPLICATE VWW06-SD05DP-0006
1						
					1.2-6' SILTY SAND (SM) w/ SHELL HASH, 5Y 5/1 (GRAY), WET COHESIVE, NON PLASTIC MEDIUM DENSITY, FINE TO MEDIUM GRAINED SAND WITH MEDIUM TO COARSE SHELL HASH, COARSENING DOWNWARD.	
2						1340 COLLECT SAMPLE VWW06-SD05-2430
3						
	3-6.5'					
4						1345 COLLECT SAMPLE VWW06-SD05-4854
5						
6					6-6.5' SAND (SP), 5Y5/1 (GRAY), WET, COHESIVE NON PLASTIC, VERY DENSE VERY FINE SAND.	1350 COLLECT SAMPLE VWW06-SD05-
					TD = 6.5'	

Sampler Signature: [signature] Date: 7/29/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD051 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/28/14

WEATHER: PARTLY CLOUDY / ≈ 88°F BREEZY DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 5016 SLIDE HAMMER W/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 1335 7/28/14 END: 1425 7/28/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.75' SILT W/SAND (ML) 5Y 2.5/1, (BLACK), WET NON COHESIVE, NO PLASTIC VERY SOFT, SILT WITH VERY FINE TO FINE SAND.	1406 COLLECT SAMPLE: VWW06-SD051-0006
1					0.75-4' SILTY SAND (SM) W/ SHELL HASH, 5Y6/2 (LIGHT OLIVE GRAY), WET, NON-COHESIVE, NON PLASTIC, MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND WITH SOME SHELL HASH. WITH SHELL HASH COARSENING DOWNWARD	
2						1405 COLLECT SAMPLE VWW06-SD051-2430
3						
4					4-5' VERY COARSE SHELL HASH WITH LITTLE FINE GRAINED SAND, WET, NON COHESIVE, NON PLASTIC, LOOSE, 5Y 8/2 (PALE YELLOW) TO 5Y5/1 (GRAY).	1410 COLLECT SAMPLES VWW06-SD051-4854
5					5-6.5 SILTY SAND (SM) 5Y6/2 (LIGHT OLIVE GRAY) NON COHESIVE, WET, NON-PLASTIC. FINE TO MEDIUM GRAINED SAND.	
6						1415 COLLECT SAMPLE VWW06-SD051-7278

Sampler Signature: [signature] Date: 7/28/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD052 SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/28/14

WEATHER: PARTLY CLOUDY ≈ 87°F RG DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 35 lb SLIDE HAMMER w/ 4' GEOPROBE SAMPLER

WATER LEVELS: START: 1245 7/28/14 END: 1330 7/28/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.5' SILT w/SAND (ML), 5Y 2.5/1 (BLACK), WET, NON COHESIVE, NO PLASTIC VERY SOFT, SILT WITH VERY FINE TO FINE SAND.	1300 COLLECT SAMPLE: VWW06-SD052-0006
1					0.5-5' SILTY SAND (SM) w/SHELL HASH 5Y 6/2, (LIGHT OLIVE GRAY), WET, NON COHESIVE, NON-PLASTIC, MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND WITH SOME SHELL HASH, COARSENING DOWNWARD.	
2						1305 COLLECT SAMPLE: VWW06-SD052-2430
3						
4	3-6.5'					1310 COLLECT SAMPLE VWW06-SD052-4854
5					5-6.5' SAND (SP), 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, VERY DENSE, VERY FINE SAND w/ LARGE PIECE OF ORGANIC MATERIAL (ROOT).	
6						1315 COLLECT SAMPLE VWW06-SD052-7278
					TD=6.5'	

Sampler Signature: [signature] Date: 7/28/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID RE 7/28/14 VWW06-SD053	SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/28/14

WEATHER: SUNNY TO PARTLY CLOUDY ~88°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 35 lb SLIDE HAMMER W/ GEOPROBE SAMPLER (4')

WATER LEVELS: START: 1135 7/28/14 END: 1230 7/28/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
0.5'	0-0.5				0-0.5' SILT W/SAND (ML), 5Y 2.5/1 (BLACK), NO PLASTIC, NO COHESIVE WET, SILT WITH FINE SAND	1145 COLLECT SAMPLE: VWW06-SD053-0006
1	0-3'				0.5'-2.5' - SILTY SAND (SM) WITH SHELL HASH, 5Y 4/1 (DARK GRAY). WET, COHESIVE, NON PLASTIC, MEDIUM DENSITY FINE TO MEDIUM GRAINED SAND WITH FINE SHELL HASH.	
2						1150 COLLECT SAMPLE: VWW06-SD053-2430
3					2.5-2.75, COARSE SHELL HASH, 5Y 6/1 (GRAY), WET COHESIVE, NON PLASTIC, MEDIUM DENSITY, SHELL HASH W/ LITTLE MEDIUM GRAINE SAND.	
4	3-6.5'				2.75-5' SILTY SAND (SM) 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, MEDIUM DENSITY, FINE TO MEDIUM GRAINED SAND WITH LITTLE SHELL HASH. SHELL HASH COARSENING DOWNWARD.	1155 COLLECT SAMPLE: VWW06-SD053-4854
5					5-6.5' SAND (SP), 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, VERY DENSE VERY FINE SAND	
6						1200 COLLECT SAMPLE VWW06-SD053-7278
					TD: 6.5'	

Sampler Signature: [signature] 7/28/14 Date: 7/28/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06 - SD05 / SHEET 1 OF 1

SEDIMENT SAMPLE LOG

PROJECT : SWMU 6 Sediment Sampling, Vieques, PR LOCATION : SWMU 6 DATE: 7/28/14

WEATHER: Sunny / Partly Cloudy ~87°F DRILLING CONTRACTOR : Parratt-Wolff

DRILLING METHOD AND EQUIPMENT USED : 50 lb Slide Hammer w/ Geoprobe Sampler (4')

WATER LEVELS : START : 0950 7/28/14 END : 1045 7/28/14 LOGGER : R. Figueras

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
	0-3'				0-0.75' SILT w/ SAND (ML), 5Y 2.5/1, (BLACK), WET, NO COHESIVE, NON PLASTIC SILT WITH FINE TO MEDIUM SAND	1000 COLLECT SAMPLE: VWW06-SD05-0006 RF 7/28/14
1					0.75'-3' SILTY SAND (ML) WITH SHELL HASH, WET, 5YR 3/1 (VERY DARK GRAY) COHESIVE, LOW PLASTICITY, MEDIUM DENSITY, FINE TO MEDIUM GRAINED SAND WITH SILT AND MEDIUM SHELL HASH.	
2						1005 COLLECT SAMPLE: VWW06-SD05-2430 4 RF 7/28/14
3						
	3-6.5'				3-3.75' COARSE SHELL HASH, 5Y 7/3 (PALE YELLOW) WET, NON COHESIVE, NON PLASTIC	
4					3.75'-4.5' SAND (SP), 5Y 6/1, (GRAY), WET, COHESIVE, NON PLASTIC, DENSE, INTER-BEDDED WITH SHELL HASH. FINE SAND w/ BEDS OF SHELL HASH.	
					4.5-5' SHELL HASH w/ FINE SAND AND ORGANIC MATERIAL (WOOD). WET, COHESIVE, NON PLASTIC	1010 COLLECT SAMPLE: VWW06-SD05-5460 RF 7/28/14
5					5-6.5' SAND (SP), 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, VERY DENSE VERY FINE SAND.	
6						1015 COLLECT SAMPLE: VWW06-SD05-7278 4 RF 7/28/14
					TD = 6.5'	

Sampler Signature: [signature] Date: 7/28/14

Sediment Boring Log Template

CH2MHILL	PROJECT NUMBER 433193.FI.FK S6	BORING NUMBER/STATION ID VWW06-SD~~0058~~055 SHEET 1 OF 1 RF 7/30/14

SEDIMENT SAMPLE LOG

PROJECT: **SWMU 6 Sediment Sampling, Vieques, PR** LOCATION: **SWMU 6** DATE: 7/30/14

WEATHER: SUNNY / PARTLY CLOUDY ≈ 85°F DRILLING CONTRACTOR: **Parratt-Wolff**

DRILLING METHOD AND EQUIPMENT USED: 50 lb SLIDE HAMMER w/ 4' GOO PROBE SAMPLER

WATER LEVELS: START: 0845 7/30/14 END: 0930 7/30/14 LOGGER: R. FIELDS

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (IN)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6"-6" (N)	CORE DESCRIPTION: SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS: DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. OVM (ppm): Breathing Zone Above Hole
					0-0.5' SILT (ML), GLEY 1 2.5/N (GREENISH BLACK), VERY WET, NON COHESIVE, NON PLASTIC, VERY LOOSE SILT	0900 COLLECT SAMPLE VWW06-SD~~0058~~-0006
1	0-1.3'				0.5'-1.3' SILTY SAND (SM) 5Y 2.5/1 (BLACK), WET COHESIVE, NON PLASTIC, MEDIUM DENSE, FINE TO MEDIUM GRAINED SAND W/ FEW COARSE GRAINED SAND (16 TO 30%).	
2					1.3-6' SHELL HASH W/SAND, 5Y 7/2 (LIGHT GRAY), WET, NON COHESIVE, NON PLASTIC LOOSE, SHELL HASH WITH FINE TO MEDIUM GRAINED SAND - SHELL HASH COARSENING DOWNWARD	0905 COLLECT SAMPLE VWW06-SD~~0058~~-2430
						0910 COLLECT FIELD DUP VWW06-SD~~0058~~-2430 RF 55P
3						
4	3-6.5'					0915 COLLECT SAMPLE VWW06-SD~~0058~~-4854
5						
6					6-6.5' SAND (SP) 5Y 5/1 (GRAY), WET, COHESIVE, NON PLASTIC, VERY FINE SAND W/ TRACE SHELL HASH TD = 6.5'	0920 COLLECT SAMPLE VWW06-SD~~0058~~-7278
			TD = 6.5'			55 RF 7/30/14

Sampler Signature: [signature] Date: 7/30/14

Sediment Boring Log Template

Appendix B
Sample Location Coordinate Information

APPENDIX B
Sample Location Coordinate Information

Site	Station	Coordinates	
SWMU 6 - Lagoon Sampling Stations	**VWW06-SD024**	20Q 228925.13E	2005094.27N
	VWW06-SD025	20Q 228930.33E	2005097.25N
	VWW06-SD026	20Q 228935.52E	2005100.27N
	VWW06-SD027	20Q 228940.95E	2005103.37N
	VWW06-SD028	20Q 228946.10E	2005106.17N
	VWW06-SD029	20Q 228928.30E	2005089.25N
	VWW06-SD030	20Q 228933.54E	2005092.47N
	VWW06-SD031	20Q 228939.01E	2005095.69N
	VWW06-SD032	20Q 228944.42E	2005098.88N
	VWW06-SD033	20Q 228949.87E	2005101.72N
	VWW06-SD034	20Q 228925.88E	2005080.67N
	VWW06-SD035	20Q 228931.09E	2005083.62N
	VWW06-SD036	20Q 228936.61E	2005087.00N
	VWW06-SD037	20Q 228941.68E	2005090.27N
	VWW06-SD038	20Q 228947.12E	2005093.74N
	VWW06-SD039	20Q 228952.39E	2005096.84N
	VWW06-SD040	20Q 228929.34E	2005075.12N
	VWW06-SD041	20Q 228934.58E	2005078.35N
	VWW06-SD042	20Q 228939.74E	2005081.54N
	VWW06-SD043	20Q 228945.09E	2005085.08N
	VWW06-SD044	20Q 228950.56E	2005088.01N
	VWW06-SD045	20Q 228955.77E	2005091.11N
	VWW06-SD046	20Q 228938.04E	2005073.46N
	VWW06-SD047	20Q 228943.07E	2005076.34N
	VWW06-SD048	20Q 228948.30E	2005079.38N
	VWW06-SD049	20Q 228953.70E	2005082.88N
	VWW06-SD050	20Q 228959.14E	2005085.71N
	VWW06-SD051	20Q 228940.92E	2005067.46N
	VWW06-SD052	20Q 228946.05E	2005070.95N
	VWW06-SD053	20Q 228951.35E	2005074.43N
	VWW06-SD054	20Q 228956.70E	2005077.46N
	VWW06-SD055	20Q 228968.85E	2005090.37N

Appendix C
Analytical Data Summary

Vieques West
SWMU 6
Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD024					VWW06-SD025			
Sample ID	VWW06-SD024-0006	VWW06-SD024P-0006	VWW06-SD024-2430	VWW06-SD024-4854	VWW06-SD024-7278	VWW06-SD025-0006	VWW06-SD025-2430	VWW06-SD025-4854	VWW06-SD025-7278
Sample Date	08/05/14	08/05/14	08/05/14	08/05/14	08/05/14	08/05/14	08/05/14	08/05/14	08/05/14
Chemical Name									
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor, total (calculated by laboratory)	19.8 UJ	19.2 UJ	21.5 UJ	15.6 U	16 UJ	13.8 UJ	21.1 U	18.9 U	14.6 U
Aroclor-1016	14.8 UJ	14.4 UJ	16.1 UJ	11.7 U	12 UJ	10.4 UJ	15.8 U	14.2 U	11 U
Aroclor-1221	14.8 UJ	14.4 UJ	16.1 UJ	11.7 U	12 UJ	10.4 UJ	15.8 U	14.2 U	11 U
Aroclor-1232	14.8 UJ	14.4 UJ	16.1 UJ	11.7 U	12 UJ	10.4 UJ	15.8 U	14.2 U	11 U
Aroclor-1242	14.8 UJ	14.4 UJ	16.1 UJ	11.7 U	12 UJ	10.4 UJ	15.8 U	14.2 U	11 U
Aroclor-1248	14.8 UJ	14.4 UJ	16.1 UJ	11.7 U	12 UJ	10.4 UJ	15.8 U	14.2 U	11 U
Aroclor-1254	14.8 UJ	14.4 UJ	16.1 UJ	11.7 U	12 UJ	10.4 UJ	15.8 U	14.2 U	11 U
Aroclor-1260	14.8 UJ	14.4 UJ	16.1 UJ	11.7 U	12 UJ	10.4 UJ	15.8 U	14.2 U	11 U
Aroclor-1262	14.8 UJ	14.4 UJ	16.1 UJ	11.7 U	12 UJ	10.4 UJ	15.8 U	14.2 U	11 U
Aroclor-1268	14.8 UJ	14.4 UJ	16.1 UJ	11.7 U	12 UJ	10.4 UJ	15.8 U	14.2 U	11 U
Total Aroclors (calculated per SAP)	22.2	21.6	24.2	17.6	18.0	15.6	23.7	21.3	16.5
Total Metals (MG/KG)									
Lead	160	194	1.87 J	1.25 J	1.67 J	300	1.95 J	1.42 J	1.04 J
Zinc	200	226	8.42 U	8.51 J	10 J	509	7.81 U	6.13 J	8.73 J

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Notes:

Shading indicates detections

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Vieques West
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Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD026					VWW06-SD027			
Sample ID	VWW06-SD026-0006	VWW06-SD026-2430	VWW06-SD026P-2430	VWW06-SD026-4854	VWW06-SD026-7278	VWW06-SD027-0006	VWW06-SD027-2430	VWW06-SD027-4854	VWW06-SD027-7278
Sample Date	08/05/14	08/05/14	08/05/14	08/05/14	08/05/14	08/05/14	08/05/14	08/05/14	08/05/14
Chemical Name									
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor, total (calculated by laboratory)	14.8 U	21.7 U	21.1 U	17.7 UJ	18 U	16.9 UJ	28.7 U	17.6 U	15.6 U
Aroclor-1016	11.1 U	16.3 U	15.9 U	13.3 UJ	13.5 U	12.6 UJ	21.5 U	13.2 U	11.7 U
Aroclor-1221	11.1 U	16.3 U	15.9 U	13.3 UJ	13.5 U	12.6 UJ	21.5 U	13.2 U	11.7 U
Aroclor-1232	11.1 U	16.3 U	15.9 U	13.3 UJ	13.5 U	12.6 UJ	21.5 U	13.2 U	11.7 U
Aroclor-1242	11.1 U	16.3 U	15.9 U	13.3 UJ	13.5 U	12.6 UJ	21.5 U	13.2 U	11.7 U
Aroclor-1248	11.1 U	16.3 U	15.9 U	13.3 UJ	13.5 U	12.6 UJ	21.5 U	13.2 U	11.7 U
Aroclor-1254	21.3 U	16.3 U	15.9 U	13.3 UJ	13.5 U	88.1 UJ	21.5 U	13.2 U	11.7 U
Aroclor-1260	11.1 U	16.3 U	15.9 U	13.3 UJ	13.5 U	12.6 UJ	21.5 U	13.2 U	11.7 U
Aroclor-1262	11.1 U	16.3 U	15.9 U	13.3 UJ	13.5 U	12.6 UJ	21.5 U	13.2 U	11.7 U
Aroclor-1268	11.1 U	16.3 U	15.9 U	13.3 UJ	13.5 U	12.6 UJ	21.5 U	13.2 U	11.7 U
Total Aroclors (calculated per SAP)	21.8	24.5	23.9	20.0	20.3	56.7	32.3	19.8	17.6
Total Metals (MG/KG)									
Lead	363	22.7 J	14.8 J	1.42 J	1.6 J	455	3.49 J	1.82 J	2.07 J
Zinc	892	47.7 J	104 J	3.33 J	13.7	439	5.64 J	13.6	8.51 J

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Vieques West
SWMU 6
Validated Sediment Raw Analytical Data
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Station ID	VWW06-SD028					VWW06-SD029			
Sample ID	VWW06-SD028-0006	VWW06-SD028-2430	VWW06-SD028P-2430	VWW06-SD028-4854	VWW06-SD028-7278	VWW06-SD029-0006	VWW06-SD029-2430	VWW06-SD029-4854	VWW06-SD029-7278
Sample Date	08/05/14	08/05/14	08/05/14	08/05/14	08/05/14	08/04/14	08/04/14	08/04/14	08/04/14
Chemical Name									
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor, total (calculated by laboratory)	18.1 U	21.5 U	21.1 U	15.9 UJ	14.8 U	25.6 J	19.8 U	16.5 U	14.8 U
Aroclor-1016	13.6 U	16.2 U	15.8 U	11.9 UJ	11.1 U	13.4 U	14.9 U	12.4 U	11.1 U
Aroclor-1221	13.6 U	16.2 U	15.8 U	11.9 UJ	11.1 U	13.4 U	14.9 U	12.4 U	11.1 U
Aroclor-1232	13.6 U	16.2 U	15.8 U	11.9 UJ	11.1 U	13.4 U	14.9 U	12.4 U	11.1 U
Aroclor-1242	13.6 U	16.2 U	15.8 U	11.9 UJ	11.1 U	13.4 U	14.9 U	12.4 U	11.1 U
Aroclor-1248	13.6 U	16.2 U	15.8 U	11.9 UJ	11.1 U	13.4 U	14.9 U	12.4 U	11.1 U
Aroclor-1254	13.6 U	16.2 U	15.8 U	11.9 UJ	11.1 U	25.6 J	14.9 U	12.4 U	11.1 U
Aroclor-1260	13.6 U	16.2 U	15.8 U	11.9 UJ	11.1 U	13.4 U	14.9 U	12.4 U	11.1 U
Aroclor-1262	13.6 U	16.2 U	15.8 U	11.9 UJ	11.1 U	13.4 U	14.9 U	12.4 U	11.1 U
Aroclor-1268	13.6 U	16.2 U	15.8 U	11.9 UJ	11.1 U	13.4 U	14.9 U	12.4 U	11.1 U
Total Aroclors (calculated per SAP)	20.4	24.3	23.7	17.9	16.7	39.0	22.4	18.6	16.7
Total Metals (MG/KG)									
Lead	357	4.11	4.15	1.68 J	1.52 J	161	1.45 J	1.13 J	0.862 J
Zinc	409	7.89 J	8.13 J	4.42 J	6.48 J	178	7.8 U	9.84 J	7.07 J

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

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Validated Sediment Raw Analytical Data
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Station ID	VWW06-SD030					VWW06-SD031			
Sample ID	VWW06-SD030-0006	VWW06-SD030-2430	VWW06-SD030-4854	VWW06-SD030P-4854	VWW06-SD030-7278	VWW06-SD031-0006	VWW06-SD031-2430	VWW06-SD031-4854	VWW06-SD031-7278
Sample Date	08/04/14	08/04/14	08/04/14	08/04/14	08/04/14	08/04/14	08/04/14	08/04/14	08/04/14
Chemical Name									
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor, total (calculated by laboratory)	57.5 J	20.8 U	15 UJ	15.6 U	15.8 UJ	108 J-	19.5 U	20.2 U	15.8 UJ
Aroclor-1016	19.3 U	15.6 U	11.3 UJ	11.7 U	11.9 UJ	17.7 UJ	14.6 U	15.2 U	11.9 UJ
Aroclor-1221	19.3 U	15.6 U	11.3 UJ	11.7 U	11.9 UJ	17.7 UJ	14.6 U	15.2 U	11.9 UJ
Aroclor-1232	19.3 U	15.6 U	11.3 UJ	11.7 U	11.9 UJ	17.7 UJ	14.6 U	15.2 U	11.9 UJ
Aroclor-1242	19.3 U	15.6 U	11.3 UJ	11.7 U	11.9 UJ	17.7 UJ	14.6 U	15.2 U	11.9 UJ
Aroclor-1248	19.3 U	15.6 U	11.3 UJ	11.7 U	11.9 UJ	17.7 UJ	14.6 U	15.2 U	11.9 UJ
Aroclor-1254	57.5	15.6 U	11.3 UJ	11.7 U	11.9 UJ	108 J-	14.6 U	15.2 U	11.9 UJ
Aroclor-1260	19.3 U	15.6 U	11.3 UJ	11.7 U	11.9 UJ	17.7 UJ	14.6 U	15.2 U	11.9 UJ
Aroclor-1262	19.3 U	15.6 U	11.3 UJ	11.7 U	11.9 UJ	17.7 UJ	14.6 U	15.2 U	11.9 UJ
Aroclor-1268	19.3 U	15.6 U	11.3 UJ	11.7 U	11.9 UJ	17.7 UJ	14.6 U	15.2 U	11.9 UJ
Total Aroclors (calculated per SAP)	76.8	23.4	17.0	17.6	17.9	125.7	21.9	22.8	17.9
Total Metals (MG/KG)									
Lead	164 J	1.25 J	1.04 J	1.26 J	1.48 J	205 J	10.9	1.29 J	1.13 J
Zinc	231 J	7.58 U	8.3 J	9.63 J	9.99 J	446 J	81.5	12.8 J	8.53 J

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Vieques West
SWMU 6
Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD032					VWW06-SD033			
Sample ID	VWW06-SD032-0006	VWW06-SD032-2430	VWW06-SD032-4854	VWW06-SD032P-4854	VWW06-SD032-7278	VWW06-SD033-0006	VWW06-SD033-2430	VWW06-SD033-4854	VWW06-SD033-7278
Sample Date	08/04/14	08/04/14	08/04/14	08/04/14	08/04/14	08/05/14	08/05/14	08/05/14	08/05/14
Chemical Name									
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor, total (calculated by laboratory)	37.9 J	15.1 U	15.8 U	16 UJ	15.7 U	21.2 UJ	18.2 U	16.5 U	15.2 U
Aroclor-1016	16.8 U	11.3 U	11.9 U	12 UJ	11.8 U	15.9 UJ	13.6 U	12.4 U	11.4 U
Aroclor-1221	16.8 U	11.3 U	11.9 U	12 UJ	11.8 U	15.9 UJ	13.6 U	12.4 U	11.4 U
Aroclor-1232	16.8 U	11.3 U	11.9 U	12 UJ	11.8 U	15.9 UJ	13.6 U	12.4 U	11.4 U
Aroclor-1242	16.8 U	11.3 U	11.9 U	12 UJ	11.8 U	15.9 UJ	13.6 U	12.4 U	11.4 U
Aroclor-1248	16.8 U	11.3 U	11.9 U	12 UJ	11.8 U	15.9 UJ	13.6 U	12.4 U	11.4 U
Aroclor-1254	37.9	11.3 U	11.9 U	12 UJ	11.8 U	15.9 UJ	13.6 U	12.4 U	11.4 U
Aroclor-1260	16.8 U	11.3 U	11.9 U	12 UJ	11.8 U	15.9 UJ	13.6 U	12.4 U	11.4 U
Aroclor-1262	16.8 U	11.3 U	11.9 U	12 UJ	11.8 U	15.9 UJ	13.6 U	12.4 U	11.4 U
Aroclor-1268	16.8 U	11.3 U	11.9 U	12 UJ	11.8 U	15.9 UJ	13.6 U	12.4 U	11.4 U
Total Aroclors (calculated per SAP)	54.7	17.0	17.9	18.0	17.7	23.9	20.4	18.6	17.1
Total Metals (MG/KG)									
Lead	273 J	1.29 J	1.19 J	1.18 J	1.34 J	307	1.91 J	1.42 J	1.27 J
Zinc	383 J	5.16 J	10.9 J	9.99 J	7.65 J	545	6.74 J	10.6 J	9.36 J

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Vieques West
SWMU 6
Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD034				VWW06-SD035				
Sample ID	VWW06-SD034-0006	VWW06-SD034-2430	VWW06-SD034-4854	VWW06-SD034-7278	VWW06-SD035-0006	VWW06-SD035P-0006	VWW06-SD035-2430	VWW06-SD035-4854	VWW06-SD035-7278
Sample Date	08/01/14	08/01/14	08/01/14	08/01/14	08/01/14	08/01/14	08/01/14	08/01/14	08/01/14
Chemical Name									
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor, total (calculated by laboratory)	33.5 UJ	18.7 U	21.3 UJ	17.1 UJ	28.4 J-	41.7 J-	18.8 U	19.5 UJ	19.7 U
Aroclor-1016	25.2 UJ	14.1 U	16 UJ	12.9 UJ	19.6 UJ	20 UJ	14.1 U	14.7 UJ	14.8 U
Aroclor-1221	25.2 UJ	14.1 U	16 UJ	12.9 UJ	19.6 UJ	20 UJ	14.1 U	14.7 UJ	14.8 U
Aroclor-1232	25.2 UJ	14.1 U	16 UJ	12.9 UJ	19.6 UJ	20 UJ	14.1 U	14.7 UJ	14.8 U
Aroclor-1242	25.2 UJ	14.1 U	16 UJ	12.9 UJ	19.6 UJ	20 UJ	14.1 U	14.7 UJ	14.8 U
Aroclor-1248	25.2 UJ	14.1 U	16 UJ	12.9 UJ	19.6 UJ	20 UJ	14.1 U	14.7 UJ	14.8 U
Aroclor-1254	25.2 UJ	14.1 U	16 UJ	12.9 UJ	28.4 J-	41.7 J-	14.1 U	14.7 UJ	14.8 U
Aroclor-1260	25.2 UJ	14.1 U	16 UJ	12.9 UJ	19.6 UJ	20 UJ	14.1 U	14.7 UJ	14.8 U
Aroclor-1262	25.2 UJ	14.1 U	16 UJ	12.9 UJ	19.6 UJ	20 UJ	14.1 U	14.7 UJ	14.8 U
Aroclor-1268	25.2 UJ	14.1 U	16 UJ	12.9 UJ	19.6 UJ	20 UJ	14.1 U	14.7 UJ	14.8 U
Total Aroclors (calculated per SAP)	37.8	21.2	24.0	19.4	48.0	61.7	21.2	22.1	22.2
Total Metals (MG/KG)									
Lead	104 J	4.57	2.32 U	1.38 J	84.6 J	118 J	1.46 J	1.29 J	1.55 J
Zinc	175 J	17.3	9.49 J	12.9	274 J	462 J	5.07 J	7.5 J	7.94 J

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Vieques West
SWMU 6
Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD036				VWW06-SD037				
Sample ID	VWW06-SD036-0006	VWW06-SD036-2430	VWW06-SD036-4854	VWW06-SD036-7278	VWW06-SD037-0006	VWW06-SD037-2430	VWW06-SD037-4854	VWW06-SD037-7278	VWW06-SD037P-7278
Sample Date	08/01/14	08/01/14	08/01/14	08/01/14	07/31/14	07/31/14	07/31/14	07/31/14	07/31/14
Chemical Name									
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor, total (calculated by laboratory)	114	17.5 U	20 U	19.9 U	67.9 J	20.9 U	20.1 U	20.7 U	20 U
Aroclor-1016	16.9 U	13.1 U	15 U	14.9 U	18.6 UJ	15.7 U	15.1 U	15.6 U	15 U
Aroclor-1221	16.9 U	13.1 U	15 U	14.9 U	18.6 UJ	15.7 U	15.1 U	15.6 U	15 U
Aroclor-1232	16.9 U	13.1 U	15 U	14.9 U	18.6 UJ	15.7 U	15.1 U	15.6 U	15 U
Aroclor-1242	16.9 U	13.1 U	15 U	14.9 U	18.6 UJ	15.7 U	15.1 U	15.6 U	15 U
Aroclor-1248	16.9 U	13.1 U	15 U	14.9 U	18.6 UJ	15.7 U	15.1 U	15.6 U	15 U
Aroclor-1254	114	13.1 U	15 U	14.9 U	67.9 J	15.7 U	15.1 U	15.6 U	15 U
Aroclor-1260	16.9 U	13.1 U	15 U	14.9 U	18.6 UJ	15.7 U	15.1 U	15.6 U	15 U
Aroclor-1262	16.9 U	13.1 U	15 U	14.9 U	18.6 UJ	15.7 U	15.1 U	15.6 U	15 U
Aroclor-1268	16.9 U	13.1 U	15 U	14.9 U	18.6 UJ	15.7 U	15.1 U	15.6 U	15 U
Total Aroclors (calculated per SAP)	130.9	19.7	22.5	22.4	86.5	23.6	22.7	23.4	22.5
Total Metals (MG/KG)									
Lead	167 J	1.62 J	1.49 J	1.51 J	191 J	1.65 J	1.72 J	1.42 J	1.68 J
Zinc	188 J	6.5 U	9.21 J	9.18 J	264 J	6.08 J	10.4 J	8.85 J	9.6 J

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Vieques West
SWMU 6
Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD038				VWW06-SD039			
Sample ID	VWW06-SD038-0006	VWW06-SD038-2430	VWW06-SD038-4854	VWW06-SD038-7278	VWW06-SD039-0006	VWW06-SD039-2430	VWW06-SD039-4854	VWW06-SD039-7278
Sample Date	07/31/14	07/31/14	07/31/14	07/31/14	07/31/14	07/31/14	07/31/14	07/31/14
Chemical Name								
Pesticide/Polychlorinated Biphenyls (UG/KG)								
Aroclor, total (calculated by laboratory)	82.9 J	17.2 UJ	20.6 UJ	21 UJ	22.1 UJ	18 U	20.3 UJ	18.4 U
Aroclor-1016	16.2 UJ	12.9 UJ	15.4 UJ	15.7 UJ	16.6 UJ	13.5 U	15.2 UJ	13.8 U
Aroclor-1221	16.2 UJ	12.9 UJ	15.4 UJ	15.7 UJ	16.6 UJ	13.5 U	15.2 UJ	13.8 U
Aroclor-1232	16.2 UJ	12.9 UJ	15.4 UJ	15.7 UJ	16.6 UJ	13.5 U	15.2 UJ	13.8 U
Aroclor-1242	16.2 UJ	12.9 UJ	15.4 UJ	15.7 UJ	16.6 UJ	13.5 U	15.2 UJ	13.8 U
Aroclor-1248	16.2 UJ	12.9 UJ	15.4 UJ	15.7 UJ	16.6 UJ	13.5 U	15.2 UJ	13.8 U
Aroclor-1254	82.9 J	12.9 UJ	15.4 UJ	15.7 UJ	16.6 UJ	13.5 U	15.2 UJ	13.8 U
Aroclor-1260	16.2 UJ	12.9 UJ	15.4 UJ	15.7 UJ	16.6 UJ	13.5 U	15.2 UJ	13.8 U
Aroclor-1262	16.2 UJ	12.9 UJ	15.4 UJ	15.7 UJ	16.6 UJ	13.5 U	15.2 UJ	13.8 U
Aroclor-1268	16.2 UJ	12.9 UJ	15.4 UJ	15.7 UJ	16.6 UJ	13.5 U	15.2 UJ	13.8 U
Total Aroclors (calculated per SAP)	99.1	19.4	23.1	23.6	24.9	20.3	22.8	20.7
Total Metals (MG/KG)								
Lead	1.88 J	0.983 J	1.32 J	1.41 J	289 J	1.03 J	1.48 J	254
Zinc	10.7 J	3.51 J	5.86 J	12.8 J	478 J	6.67 U	8.79 J	291

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Vieques West
SWMU 6
Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD040				VWW06-SD041			
Sample ID	VWW06-SD040-0006	VWW06-SD040-2430	VWW06-SD040-4854	VWW06-SD040-7278	VWW06-SD041-0006	VWW06-SD041-2430	VWW06-SD041-4854	VWW06-SD041-7278
Sample Date	07/30/14	07/30/14	07/30/14	07/30/14	07/30/14	07/30/14	07/30/14	07/30/14
Chemical Name								
Pesticide/Polychlorinated Biphenyls (UG/KG)								
Aroclor, total (calculated by laboratory)	20.9 U	19 U	19.8 U	19.7 U	39.7 J	17.9 U	20.6 U	19.9 UJ
Aroclor-1016	15.7 U	14.3 U	14.8 U	14.8 U	14.9 U	13.4 U	15.5 U	14.9 UJ
Aroclor-1221	15.7 U	14.3 U	14.8 U	14.8 U	14.9 U	13.4 U	15.5 U	14.9 UJ
Aroclor-1232	15.7 U	14.3 U	14.8 U	14.8 U	14.9 U	13.4 U	15.5 U	14.9 UJ
Aroclor-1242	15.7 U	14.3 U	14.8 U	14.8 U	14.9 U	13.4 U	15.5 U	14.9 UJ
Aroclor-1248	15.7 U	14.3 U	14.8 U	14.8 U	14.9 U	13.4 U	15.5 U	14.9 UJ
Aroclor-1254	15.7 U	14.3 U	14.8 U	14.8 U	39.7	13.4 U	15.5 U	14.9 UJ
Aroclor-1260	15.7 U	14.3 U	14.8 U	14.8 U	14.9 U	13.4 U	15.5 U	14.9 UJ
Aroclor-1262	15.7 U	14.3 U	14.8 U	14.8 U	14.9 U	13.4 U	15.5 U	14.9 UJ
Aroclor-1268	15.7 U	14.3 U	14.8 U	14.8 U	14.9 U	13.4 U	15.5 U	14.9 UJ
Total Aroclors (calculated per SAP)	23.6	21.5	22.2	22.2	54.6	20.1	23.3	22.4
Total Metals (MG/KG)								
Lead	79.6	1.23 J	1.5 J	1.76 J	111	1.14 J	1.35 J	1.19 J
Zinc	112	5.74 J	5.8 J	11.5 J	126	4.21 J	6.7 J	11.7 J

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Vieques West
SWMU 6
Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD042					VWW06-SD043			
Sample ID	VWW06-SD042-0006	VWW06-SD042-2430	VWW06-SD042P-2430	VWW06-SD042-4854	VWW06-SD042-7278	VWW06-SD043-0006	VWW06-SD043-2430	VWW06-SD043-4854	VWW06-SD043-7278
Sample Date	07/30/14	07/30/14	07/30/14	07/30/14	07/30/14	07/30/14	07/30/14	07/30/14	07/30/14
Chemical Name									
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor, total (calculated by laboratory)	43.5 J	18.4 U	17.5 U	18.2 U	19.9 U	50.1 J	17.4 U	19.3 U	19.3 U
Aroclor-1016	18.7 U	13.8 U	13.1 U	13.7 U	14.9 U	59.1 U	13.1 U	14.5 U	14.5 U
Aroclor-1221	18.7 U	13.8 U	13.1 U	13.7 U	14.9 U	19.7 U	13.1 U	14.5 U	14.5 U
Aroclor-1232	18.7 U	13.8 U	13.1 U	13.7 U	14.9 U	59.1 U	13.1 U	14.5 U	14.5 U
Aroclor-1242	18.7 U	13.8 U	13.1 U	13.7 U	14.9 U	50.1	13.1 U	14.5 U	14.5 U
Aroclor-1248	18.7 U	13.8 U	13.1 U	13.7 U	14.9 U	19.7 U	13.1 U	14.5 U	14.5 U
Aroclor-1254	43.5	13.8 U	13.1 U	13.7 U	14.9 U	123 U	13.1 U	14.5 U	14.5 U
Aroclor-1260	18.7 U	13.8 U	13.1 U	13.7 U	14.9 U	19.7 U	13.1 U	14.5 U	14.5 U
Aroclor-1262	18.7 U	13.8 U	13.1 U	13.7 U	14.9 U	19.7 U	13.1 U	14.5 U	14.5 U
Aroclor-1268	18.7 U	13.8 U	13.1 U	13.7 U	14.9 U	19.7 U	13.1 U	14.5 U	14.5 U
Total Aroclors (calculated per SAP)	62.2	20.7	19.7	20.6	22.4	121.5	19.7	21.8	21.8
Total Metals (MG/KG)									
Lead	131 J	1.35 J	1.37 J	1.31 J	1.97	420 J	1.28 J	1.53 J	1.61 J
Zinc	187 J	5.16 J	5.03 J	4.54 J	14.4 J	548 J	3.73 J	7.01 U	7.83 J

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Vieques West
SWMU 6
Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD044				VWW06-SD045			
Sample ID	VWW06-SD044-0006	VWW06-SD044-2430	VWW06-SD044-4854	VWW06-SD044-7278	VWW06-SD045-0006	VWW06-SD045-2430	VWW06-SD045-4854	VWW06-SD045-7278
Sample Date	07/31/14	07/31/14	07/31/14	07/31/14	07/31/14	07/31/14	07/31/14	07/31/14
Chemical Name								
Pesticide/Polychlorinated Biphenyls (UG/KG)								
Aroclor, total (calculated by laboratory)	20.9 U	16.9 U	20.5 UJ	18.3 U	40.4 UJ	15.1 U	19.7 UJ	17.8 U
Aroclor-1016	15.7 U	12.7 U	15.4 UJ	13.8 U	30.3 UJ	11.3 U	14.8 UJ	13.4 U
Aroclor-1221	15.7 U	12.7 U	15.4 UJ	13.8 U	30.3 UJ	11.3 U	14.8 UJ	13.4 U
Aroclor-1232	15.7 U	12.7 U	15.4 UJ	13.8 U	30.3 UJ	11.3 U	14.8 UJ	13.4 U
Aroclor-1242	15.7 U	12.7 U	15.4 UJ	13.8 U	30.3 UJ	11.3 U	14.8 UJ	13.4 U
Aroclor-1248	15.7 U	12.7 U	15.4 UJ	13.8 U	30.3 UJ	11.3 U	14.8 UJ	13.4 U
Aroclor-1254	15.7 U	12.7 U	15.4 UJ	13.8 U	30.3 UJ	11.3 U	14.8 UJ	13.4 U
Aroclor-1260	15.7 U	12.7 U	15.4 UJ	13.8 U	30.3 UJ	11.3 U	14.8 UJ	13.4 U
Aroclor-1262	15.7 U	12.7 U	15.4 UJ	13.8 U	30.3 UJ	11.3 U	14.8 UJ	13.4 U
Aroclor-1268	15.7 U	12.7 U	15.4 UJ	13.8 U	30.3 UJ	11.3 U	14.8 UJ	13.4 U
Total Aroclors (calculated per SAP)	23.6	19.1	23.1	20.7	45.5	17.0	22.2	20.1
Total Metals (MG/KG)								
Lead	182	1.4 J	1.32 J	1.84	731 J	1.23 J	1.08 J	1.5 J
Zinc	283	5.79 J	5.14 J	9.24 J	1,110 J	2.98 J	5.33 J	10.8 J

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Vieques West
SWMU 6
Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD046					VWW06-SD047			
Sample ID	VWW06-SD046-0006	VWW06-SD046-2430	VWW06-SD046-4854	VWW06-SD046P-4854	VWW06-SD046-7278	VWW06-SD047-0006	VWW06-SD047-2430	VWW06-SD047-4854	VWW06-SD047-7278
Sample Date	07/29/14	07/29/14	07/29/14	07/29/14	07/29/14	07/29/14	07/29/14	07/29/14	07/29/14
Chemical Name									
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor, total (calculated by laboratory)	45.6 J	18 U	17.4 U	17.3 U	18 U	29.3 J	17.9 U	18.9 U	18.2 U
Aroclor-1016	15.4 U	13.5 U	13.1 U	13 U	13.5 U	14.4 U	13.4 U	14.2 U	13.6 U
Aroclor-1221	15.4 U	13.5 U	13.1 U	13 U	13.5 U	14.4 U	13.4 U	14.2 U	13.6 U
Aroclor-1232	15.4 U	13.5 U	13.1 U	13 U	13.5 U	14.4 U	13.4 U	14.2 U	13.6 U
Aroclor-1242	15.4 U	13.5 U	13.1 U	13 U	13.5 U	14.4 U	13.4 U	14.2 U	13.6 U
Aroclor-1248	15.4 U	13.5 U	13.1 U	13 U	13.5 U	14.4 U	13.4 U	14.2 U	13.6 U
Aroclor-1254	45.6 J	13.5 U	13.1 U	13 U	13.5 U	29.3	13.4 U	14.2 U	13.6 U
Aroclor-1260	15.4 U	13.5 U	13.1 U	13 U	13.5 U	14.4 U	13.4 U	14.2 U	13.6 U
Aroclor-1262	15.4 U	13.5 U	13.1 U	13 U	13.5 U	14.4 U	13.4 U	14.2 U	13.6 U
Aroclor-1268	15.4 U	13.5 U	13.1 U	13 U	13.5 U	14.4 U	13.4 U	14.2 U	13.6 U
Total Aroclors (calculated per SAP)	61.0	20.3	19.7	19.5	20.3	43.7	20.1	21.3	20.4
Total Metals (MG/KG)									
Lead	145	1.16 J	0.972 J	0.891 J	1.18 J	83.3	1.02 J	1.26 J	1.12 J
Zinc	335	5.5 J	3.42 J	3.27 J	6.61 J	125	4.67 J	6.66 U	6.34 J

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Vieques West
SWMU 6
Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD048					VWW06-SD049			
Sample ID	VWW06-SD048-0006	VWW06-SD048-2430	VWW06-SD048-4854	VWW06-SD048P-4854	VWW06-SD048-7278	VWW06-SD049-0006	VWW06-SD049-2636	VWW06-SD049-4854	VWW06-SD049-7278
Sample Date	07/29/14	07/29/14	07/29/14	07/29/14	07/29/14	07/29/14	07/29/14	07/29/14	07/29/14
Chemical Name									
Pesticide/Polychlorinated Biphenyls (UG/KG)									
Aroclor, total (calculated by laboratory)	114 J	19.6 U	18.3 U	17.8 U	19.2 U	16.1 NJ	23 U	18.1 U	20 U
Aroclor-1016	16.6 U	14.7 U	13.7 U	13.4 U	14.4 U	14.7 U	17.2 U	13.6 U	15 U
Aroclor-1221	16.6 U	14.7 U	13.7 U	13.4 U	14.4 U	14.7 U	17.2 U	13.6 U	15 U
Aroclor-1232	16.6 U	14.7 U	13.7 U	13.4 U	14.4 U	14.7 U	17.2 U	13.6 U	15 U
Aroclor-1242	16.6 U	14.7 U	13.7 U	13.4 U	14.4 U	14.7 U	17.2 U	13.6 U	15 U
Aroclor-1248	16.6 U	14.7 U	13.7 U	13.4 U	14.4 U	14.7 U	17.2 U	13.6 U	15 U
Aroclor-1254	114 J	14.7 U	13.7 U	13.4 U	14.4 U	16.1 NJ	17.2 U	13.6 U	15 U
Aroclor-1260	16.6 U	14.7 U	13.7 U	13.4 U	14.4 U	14.7 U	17.2 U	13.6 U	15 U
Aroclor-1262	16.6 U	14.7 U	13.7 U	13.4 U	14.4 U	14.7 U	17.2 U	13.6 U	15 U
Aroclor-1268	16.6 U	14.7 U	13.7 U	13.4 U	14.4 U	14.7 U	17.2 U	13.6 U	15 U
Total Aroclors (calculated per SAP)	130.6	22.1	20.6	20.1	21.6	30.8	25.8	20.4	22.5
Total Metals (MG/KG)									
Lead	183 J	1.2 J	1.11 J	1.04 J	1.2 J	211	1.44 J	0.847 J	1.4 J
Zinc	318 J	7.15 U	6.16 J	4.48 J	9.44 J	294	9.25 J	4.04 J	12.3 J

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UG/KG - Micrograms per kilogram

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SWMU 6
Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD050				
Sample ID	VWW06-SD050-0006	VWW06-SD050P-0006	VWW06-SD050-2430	VWW06-SD050-4854	VWW06-SD050-7278
Sample Date	07/29/14	07/29/14	07/29/14	07/29/14	07/29/14
Chemical Name					
Pesticide/Polychlorinated Biphenyls (UG/KG)					
Aroclor, total (calculated by laboratory)	87.6 J	75.9 J	18.5 U	16.4 U	19.9 U
Aroclor-1016	20.7 U	18.8 U	13.9 U	12.3 U	14.9 U
Aroclor-1221	20.7 U	15.7 U	13.9 U	12.3 U	14.9 U
Aroclor-1232	20.7 U	18.8 U	13.9 U	12.3 U	14.9 U
Aroclor-1242	20.7 U	18.8 U	13.9 U	12.3 U	14.9 U
Aroclor-1248	20.7 U	18.8 U	13.9 U	12.3 U	14.9 U
Aroclor-1254	87.6 J	75.9 J	13.9 U	12.3 U	14.9 U
Aroclor-1260	20.7 U	15.7 U	13.9 U	12.3 U	14.9 U
Aroclor-1262	20.7 U	15.7 U	13.9 U	12.3 U	14.9 U
Aroclor-1268	20.7 U	15.7 U	13.9 U	12.3 U	14.9 U
Total Aroclors (calculated per SAP)	108.3	93.2	20.9	18.5	22.4
Total Metals (MG/KG)					
Lead	290 J	213 J	1.46 J	0.84 J	1.2 J
Zinc	535 J	422	5.13 J	4.22 J	11.7 J

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MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Vieques West
SWMU 6
Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD051				VWW06-SD052				VWW06-SD053			
Sample ID	VWW06-SD051-0006	VWW06-SD051-2430	VWW06-SD051-4854	VWW06-SD051-7278	VWW06-SD052-0006	VWW06-SD052-2430	VWW06-SD052-4854	VWW06-SD052-7278	VWW06-SD053-0006	VWW06-SD053-2430	VWW06-SD053-4854	VWW06-SD053-7278
Sample Date	07/28/14	07/28/14	07/28/14	07/28/14	07/28/14	07/28/14	07/28/14	07/28/14	07/28/14	07/28/14	07/28/14	07/28/14
Chemical Name												
Pesticide/Polychlorinated Biphenyls (UG/KG)												
Aroclor, total (calculated by laboratory)	34.5 J	18 UJ	18.2 U	16.9 UJ	32.5 J	17 U	19.9 U	20.1 U	386 J	17.5 U	18.2 U	19.5 U
Aroclor-1016	13.1 U	13.5 UJ	13.7 U	12.7 UJ	14.2 U	12.7 U	14.9 U	15.1 U	36.9 U	13.1 U	13.7 U	14.6 U
Aroclor-1221	13.1 U	13.5 UJ	13.7 U	12.7 UJ	14.2 U	12.7 U	14.9 U	15.1 U	16.2 U	13.1 U	13.7 U	14.6 U
Aroclor-1232	13.1 U	13.5 UJ	13.7 U	12.7 UJ	14.2 U	12.7 U	14.9 U	15.1 U	36.9 U	13.1 U	13.7 U	14.6 U
Aroclor-1242	13.1 U	13.5 UJ	13.7 U	12.7 UJ	14.2 U	12.7 U	14.9 U	15.1 U	36.9 U	13.1 U	13.7 U	14.6 U
Aroclor-1248	13.1 U	13.5 UJ	13.7 U	12.7 UJ	14.2 U	12.7 U	14.9 U	15.1 U	36.9 U	13.1 U	13.7 U	14.6 U
Aroclor-1254	34.5 J	13.5 UJ	13.7 U	12.7 UJ	32.5 J	12.7 U	14.9 U	15.1 U	286	13.1 U	13.7 U	14.6 U
Aroclor-1260	13.1 U	13.5 UJ	13.7 U	12.7 UJ	14.2 U	12.7 U	14.9 U	15.1 U	101 J	13.1 U	13.7 U	14.6 U
Aroclor-1262	13.1 U	13.5 UJ	13.7 U	12.7 UJ	14.2 U	12.7 U	14.9 U	15.1 U	16.2 U	13.1 U	13.7 U	14.6 U
Aroclor-1268	13.1 U	13.5 UJ	13.7 U	12.7 UJ	14.2 U	12.7 U	14.9 U	15.1 U	16.2 U	13.1 U	13.7 U	14.6 U
Total Aroclors (calculated per SAP)	47.6	20.3	20.6	19.1	46.7	19.1	22.4	22.7	405.5	19.7	20.6	21.9
Total Metals (MG/KG)												
Lead	74.6	0.924 J	1.01 J	1.36 J	73.4	1.09 J	1.47 J	1.41 J	240	1.01 J	1.08 J	1.23 J
Zinc	113	5.65 J	3.98 J	7.22 J	283	5.31 J	7.28 U	11.6 J	377	5.76 J	5.91 J	7.84 J

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NJ - Analyte has been tentatively identified, estimated value

U - The material was analyzed for, but not detected
UJ - Analyte not detected, quantitation limit may be inaccurate
MG/KG - Milligrams per kilogram
UG/KG - Micrograms per kilogram

Vieques West
SWMU 6
Validated Sediment Raw Analytical Data
July - August 2014

Station ID	VWW06-SD054					VWW06-SD055				
Sample ID	VWW06-SD054-0006	VWW06-SD054-2430	VWW06-SD054-5460	VWW06-SD054-7278	VWW06-SD054P-7278	VWW06-SD055-0006	VWW06-SD055-2430	VWW06-SD055P-2430	VWW06-SD055-4854	VWW06-SD055-7278
Sample Date	07/28/14	07/28/14	07/28/14	07/28/14	07/28/14	07/30/14	07/30/14	07/30/14	07/30/14	07/30/14
Chemical Name										
Pesticide/Polychlorinated Biphenyls (UG/KG)										
Aroclor, total (calculated by laboratory)	127 J	18.1 U	23.9 U	18.4 U	18.5 U	76.7 J	18.3 U	19.8 U	20 U	19.8 U
Aroclor-1016	18.2 U	13.5 U	17.9 U	13.8 U	13.9 U	15.2 U	13.7 U	14.9 U	15 U	14.9 U
Aroclor-1221	15.1 U	13.5 U	17.9 U	13.8 U	13.9 U	15.2 U	13.7 U	14.9 U	15 U	14.9 U
Aroclor-1232	18.2 U	13.5 U	17.9 U	13.8 U	13.9 U	15.2 U	13.7 U	14.9 U	15 U	14.9 U
Aroclor-1242	18.2 U	13.5 U	17.9 U	13.8 U	13.9 U	15.2 U	13.7 U	14.9 U	15 U	14.9 U
Aroclor-1248	18.2 U	13.5 U	17.9 U	13.8 U	13.9 U	15.2 U	13.7 U	14.9 U	15 U	14.9 U
Aroclor-1254	127 J	13.5 U	17.9 U	13.8 U	13.9 U	54.6 J	13.7 U	14.9 U	15 U	14.9 U
Aroclor-1260	15.1 U	13.5 U	17.9 U	13.8 U	13.9 U	22.1 J	13.7 U	14.9 U	15 U	14.9 U
Aroclor-1262	15.1 U	13.5 U	17.9 U	13.8 U	13.9 U	15.2 U	13.7 U	14.9 U	15 U	14.9 U
Aroclor-1268	15.1 U	13.5 U	17.9 U	13.8 U	13.9 U	15.2 U	13.7 U	14.9 U	15 U	14.9 U
Total Aroclors (calculated per SAP)	143.7	20.3	26.9	20.7	20.9	84.3	20.6	22.4	22.5	22.4
Total Metals (MG/KG)										
Lead	142 J+	1.37 J	1.35 J	1.44 J	1.27 J	96.6	2.9 J	1.81 J	1.55 J	1.71 J
Zinc	247 J+	4.69 J	9.56 J	8.9 J	11.3 J	234	6.18 J	4.04 J	5.34 J	11.5 J

\\TAMPA\Proj\USNAVFACENGCOM\433193CTO0013\SWMU 6 RI Addend

Notes:

Shading indicates detections

J - Analyte present, value may or may not be accurate or precise

J- - Analyte present, value may be biased low, actual value may be higher

J+ - Analyte present, value may be biased high, actual value may be lower

NJ - Analyte has been tentatively identified, estimated value

U - The material was analyzed for, but not detected

UJ - Analyte not detected, quantitation limit may be inaccurate

MG/KG - Milligrams per kilogram

UG/KG - Micrograms per kilogram

Appendix D
Data Validation Report

DataQual
Environmental Services, LLC

CH2M HILL-VBO
5701 Cleveland Street
Suite 200
Virginia Beach, VA 23462

October 28, 2014
SDG# 1407217; Empirical Laboratories, LLC
Vieques CTO-113, SWMU6 - Naval Training Range

Dear Ms. Dean,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1407217. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, professional judgment, and the guidance offered in the region II SOPs HW-2a Revision 15, December 2012, for ICP-AES data validation and HW-37 Revision 3, May 2013, for PCB data validation. The DoD Quality Systems Manual for Environmental Laboratories Version 4.2 and the project specific SAP were also consulted. Worksheets tabulating the validation process including calculation verifications are included in the support documentation section of this report. All areas of concern are discussed in the body of the report and a summary of data qualifications are provided.

Sample ID	Lab ID	Matrix	PCB	Pb, Zn
VWW06-SD054-0006	1407217-01	soil	X	X
VWW06-SD054-2430	1407217-02	soil	X	X
VWW06-SD054-5460	1407217-03	soil	X	X
VWW06-SD054-7278	1407217-04	soil	X	X
VWW06-SD054P-7278	1407217-05	soil	X	X
VWW06-SD053-0006	1407217-06	soil	X	X
VWW06-SD053-2430	1407217-07	soil	X	X
VWW06-SD053-2430MS	1407217-07MS	soil	X	X
VWW06-SD053-2430MSD	1407217-07MSD	soil	X	X
VWW06-SD053-4854	1407217-08	soil	X	X
VWW06-SD053-7278	1407217-09	soil	X	X
VWW06-SD052-0006	1407217-10	soil	X	X
VWW06-SD052-2430	1407217-11	soil	X	X
VWW06-SD052-4854	1407217-12	soil	X	X
VWW06-SD052-7278	1407217-13	soil	X	X
VWW06-SD051-0006	1407217-14	soil	X	X
VWW06-SD051-2430	1407217-15	soil	X	X
VWW06-SD051-4854	1407217-16	soil	X	X
VWW06-SD051-7278	1407217-17	soil	X	X
VWW06-EB01-072914	1407217-18	water	X	X

The following quality control samples were provided with this SDG: sample VWW06-SD054P-7278-field duplicate of sample VWW06-SD054-7278; and rinse blank sample VWW06-EB01-072914.

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The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition
- Technical Holding Times *
- Initial/Continuing Calibrations *
- ICSA/ICSAB Standards *
- Low Level Standards *
- Blanks *
- Surrogate Recoveries
- Laboratory Control Samples *
- Matrix Spike Recoveries
- Matrix Duplicate RPDs *
- Serial Dilutions *
- Field Duplicates *
- Identification/Quantitation
- Reporting Limits *

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. *If an issue is not addressed in this narrative there were no actions required based on unmet quality control criteria.*

No critical findings resulting in data rejections were noted. Some major findings resulting in qualification of data as estimated were noted. The majority of the data is reported without qualification.

PCBs

Qualifications were required based on non-compliant surrogate recoveries.

Four reported positive results exhibited column quantitation %Ds greater than the 40% RPD criteria from the project specific SAP and qualifications were required.

Select Metals Pb & Zn

One sample was qualified based on high moisture content.

One sample was qualified based on Region II guidance due to non-compliant matrix spike recoveries.

Specific Evaluation of Data

Data Completeness

The SDG was received complete and intact. Updated MS/MSD results forms that included the client sample ID were requested and received from the laboratory.

Technical Holding Times

According to chain of custody records, sampling was performed on 7/28-29/14 and samples were received at the laboratory 7/30/14. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

Sample Condition

Select Metals, Pb & Zn

Sample VWW06-SD054-5460 exhibited high moisture content (%solids 44.34). The results are qualified as estimated J with an OT qualifier code.

Surrogate Recoveries

PCBs

Three samples exhibited non-compliant recoveries as noted in the following table. Results required qualifications as noted.

Sample ID	Surrogate	%R	QC Limits	Q Flag	Q Code
VWW06-EB01-072914	DCB	31.1/33.4	40-135	J-/UJ	SSL
VWW06-SD051-2430	TCMX	66.2/67.0	70-125		
VWW06-SD051-7278	TCMX	65.1/66.2	70-125		

Matrix Spike Recoveries

Select Metals, Pb & Zn

The recoveries for lead and zinc were slightly high in the associated MS of sample VWW06-SD054-0006 AT 122% and 131% respectively. Region II requires qualification

based on these recoveries. Therefore, lead and zinc were qualified as estimated biased high, J+, in the native sample only.

Compound Identification/Quantitation

PCBs

Three positive results exhibited column quantitation %D >40% (based on the SAP requirement). Results for AR1254 in samples VWW06-SD054-0006 (48%), VWW06-SD052-0006 (63%), and VWW06-SD051-0006 (72%) and for AR1260 in sample VWW06-SD053-0006 (70%) were qualified as estimated J with a qualifier code of 2C.

Please note that the reporting limits for several non-detect results in samples VWW06-SD054-0006 and VWW06-SD053-0006 were raised due to matrix interferences. This is a valid action but does not require a validation qualifier. Therefore the C9 lab qualifier is removed from the sample results.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Jacqueline Cleveland

Jacqueline Cleveland
Vice President

Summary of Data Qualifications

PCBs

Sample ID	Compounds	Results	Q Flag	Q Code
VWW06-EB01-072914, VWW06-SD051-2430, VWW06-SD051-7278	all compounds	+/-	J/UJ	SSL
VWW06-SD054-0006, VWW06-SD052-0006, VWW06-SD051-0006	AR1254 total Aroclors	+P	J	2C
VWW06-SD053-0006	AR1260 total Aroclors	+P	J	2C

Select Metals – Pb & Zn

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-SD054-5460	lead zinc	+	J	OT
VWW06-SD054-0006	lead zinc	+	J+	MSH

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
J+	estimated biased high
J-	estimated biased low
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the LOD (2X sample LOD for common laboratory contaminants) when the blank value is less than the LOD. The sample result for the blank contaminant is not qualified with any blank qualifiers.
LOD	The sample result for the blank contaminant is less than the LOD (2X sample LOD for common laboratory contaminants) but greater than the MDL when the blank value is less than the LOD. The sample result for the blank contaminant is changed to the LOD and qualified as non-detect U.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the ICB/CCB/PB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the LOD.
J+ -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the LOD.
J/UJ -	Sample result is less than 10X LOD when blank result is below the negative LOD.

Glossary of Qualification Flags and Abbreviations, continued

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.

Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD when the FB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the FB value when the FB value is greater than the LOD.
J+ -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the LOD.

General Abbreviations

MDL	method detection limit
IDL	instrument detection limit
LOD/RL	Level of Detection//Reporting Limit
LOQ	Level of Quantitation
+	positive result
-	non-detect result

ANALYSIS DATA SHEET

VWW06-SD054-0006

Laboratory	Empirical Laboratories, LLC		SDG	1407217	
Client	CH2M Hill, Inc.		Project	NTR Vieques CTO 113 SWMU 6	
Matrix	Solid	Laboratory ID	1407217-01	File ID	064F6401.D
Sampled	07/28/14 10:00	Prepared	08/05/14 08:45	Analyzed	08/08/14 06:53
Solids	52.73	Preparation	EXT 3546	Dilution	1
Batch	4H04016	Sequence	4H22505	Calibration	4209006	Instrument	QL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	127	15.1	20.1	60.4	J QC
12674-11-2	Aroclor-1016 [2C]		18.2	18.2	30.3	C9U
11104-28-2	Aroclor-1221		7.57	15.1	30.3	U
11141-16-5	Aroclor-1232		18.2	18.2	30.3	C9U
53469-21-9	Aroclor-1242 [2C]		18.2	18.2	30.3	C9U
12672-29-6	Aroclor-1248		18.2	18.2	30.3	C9U
11097-69-1	Aroclor-1254 [2C]	127	7.57	15.1	30.3	P QC
11096-82-5	Aroclor-1260		7.57	15.1	30.3	U
37324-23-5	Aroclor-1262		7.57	15.1	30.3	U
11100-14-4	Aroclor-1268		7.57	15.1	30.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.25	28.10	92.9	70 - 125	
Tetrachloro-m-xylene [2C]	30.25	27.46	90.8	70 - 125	
Decachlorobiphenyl	30.25	21.33	70.5	60 - 125	
Decachlorobiphenyl [2C]	30.25	22.65	74.9	60 - 125	

QC 11/4/14

ANALYSIS DATA SHEET

VWW06-SD054-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-02	File ID:	008F0801.D
Sampled:	07/28/14 10:05	Prepared:	08/05/14 08:45	Analyzed:	08/06/14 14:42
Solids:	57.74	Preparation:	EXT 3546	Dilution:	1
Batch:	4H04016	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.5	18.1	54.2	U
12674-11-2	Aroclor-1016		6.78	13.5	27.2	U
11104-28-2	Aroclor-1221		6.78	13.5	27.2	U
11141-16-5	Aroclor-1232		6.78	13.5	27.2	U
53469-21-9	Aroclor-1242		6.78	13.5	27.2	U
12672-29-6	Aroclor-1248		6.78	13.5	27.2	U
11097-69-1	Aroclor-1254		6.78	13.5	27.2	U
11096-82-5	Aroclor-1260		6.78	13.5	27.2	U
37324-23-5	Aroclor-1262		6.78	13.5	27.2	U
11100-14-4	Aroclor-1268		6.78	13.5	27.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.11	27.45	101	70 - 125	
Tetrachloro-m-xylene [2C]	27.11	26.02	96.0	70 - 125	
Decachlorobiphenyl	27.11	16.43	60.6	60 - 125	
Decachlorobiphenyl [2C]	27.11	17.13	63.2	60 - 125	

10/30/14

ANALYSIS DATA SHEET

VWW06-SD054-5460

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-03	File ID:	009F0901.D
Sampled:	07/28/14 10:10	Prepared:	08/05/14 08:45	Analyzed:	08/06/14 14:55
Solids:	44.34	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04016	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		17.9	23.9	71.7	U
12674-11-2	Aroclor-1016		8.97	17.9	35.9	U
11104-28-2	Aroclor-1221		8.97	17.9	35.9	U
11141-16-5	Aroclor-1232		8.97	17.9	35.9	U
53469-21-9	Aroclor-1242		8.97	17.9	35.9	U
12672-29-6	Aroclor-1248		8.97	17.9	35.9	U
11097-69-1	Aroclor-1254		8.97	17.9	35.9	U
11096-82-5	Aroclor-1260		8.97	17.9	35.9	U
37324-23-5	Aroclor-1262		8.97	17.9	35.9	U
11100-14-4	Aroclor-1268		8.97	17.9	35.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	35.87	26.61	74.2	70 - 125	
Tetrachloro-m-xylene [2C]	35.87	26.93	75.1	70 - 125	
Decachlorobiphenyl	35.87	26.10	72.8	60 - 125	
Decachlorobiphenyl [2C]	35.87	27.17	75.8	60 - 125	

010

ANALYSIS DATA SHEET

VWW06-SD054-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-04	File ID:	010F1001.D
Sampled:	07/28/14 10:15	Prepared:	08/05/14 08:45	Analyzed:	08/06/14 15:08
Solids:	57.29	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04016	Sequence:	4H21905	Calibration:	4209006
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.8	18.4	55.3	U
12674-11-2	Aroclor-1016		6.92	13.8	27.7	U
11104-28-2	Aroclor-1221		6.92	13.8	27.7	U
11141-16-5	Aroclor-1232		6.92	13.8	27.7	U
53469-21-9	Aroclor-1242		6.92	13.8	27.7	U
12672-29-6	Aroclor-1248		6.92	13.8	27.7	U
11097-69-1	Aroclor-1254		6.92	13.8	27.7	U
11096-82-5	Aroclor-1260		6.92	13.8	27.7	U
37324-23-5	Aroclor-1262		6.92	13.8	27.7	U
11100-14-4	Aroclor-1268		6.92	13.8	27.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.65	24.40	88.2	70 - 125	
Tetrachloro-m-xylene [2C]	27.65	24.88	90.0	70 - 125	
Decachlorobiphenyl	27.65	23.76	85.9	60 - 125	
Decachlorobiphenyl [2C]	27.65	24.76	89.5	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD054P-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 8	
Matrix:	Solid	Laboratory ID:	1407217-05	File ID:	014F1101.D
Sampled:	07/28/14 10:20	Prepared:	08/05/14 08:45	Analyzed:	08/06/14 15:21
Solids:	57.35	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04016	Sequence: 4H021905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.9	18.5	55.5	U
12674-11-2	Aroclor-1016		6.95	13.9	27.8	U
11104-28-2	Aroclor-1221		6.95	13.9	27.8	U
11141-16-5	Aroclor-1232		6.95	13.9	27.8	U
53469-21-9	Aroclor-1242		6.95	13.9	27.8	U
12672-29-6	Aroclor-1248		6.95	13.9	27.8	U
11097-69-1	Aroclor-1254		6.95	13.9	27.8	U
11096-82-5	Aroclor-1260		6.95	13.9	27.8	U
37324-23-5	Aroclor-1262		6.95	13.9	27.8	U
11100-14-4	Aroclor-1268		6.95	13.9	27.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.78	23.59	84.9	70 - 125	
Tetrachloro-m-xylene [2C]	27.78	23.93	86.1	70 - 125	
Decachlorobiphenyl	27.78	22.06	79.4	60 - 125	
Decachlorobiphenyl [2C]	27.78	22.95	82.6	60 - 125	

SAC 10/30/14

032

ANALYSIS DATA SHEET

VWW06-SD053-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-06	File ID:	06576501.D
Sampled:	07/28/14 11:45	Prepared:	08/05/14 08:45	Analyzed:	08/08/14 07:05
Solids:	30.74	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04016	Sequence: 4H72505	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	386	16.2	21.6	64.7	J 2C
12674-11-2	Aroclor-1016 [2C]		36.9	36.9	36.9	C9U
11104-28-2	Aroclor-1221		8.10	16.2	32.4	U
11141-16-5	Aroclor-1232		36.9	36.9	36.9	C9U
53469-21-9	Aroclor-1242 [2C]		36.9	36.9	36.9	C9U
12672-29-6	Aroclor-1248		36.9	36.9	36.9	C9U
11097-69-1	Aroclor-1254 [2C]	286	8.10	16.2	32.4	
11096-82-5	Aroclor-1260 [2C]	10	8.10	16.2	32.4	J P 2C
37324-23-5	Aroclor-1262		8.10	16.2	32.4	U
11100-14-4	Aroclor-1268		8.10	16.2	32.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	32.37	26.57	82.1	70 - 125	
Tetrachloro-m-xylene [2C]	32.37	25.98	80.3	70 - 125	
Decachlorobiphenyl	32.37	25.89	80.0	60 - 125	
Decachlorobiphenyl [2C]	32.37	27.30	84.3	60 - 125	

PDC 114

ANALYSIS DATA SHEET

VWW06-SD053-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-07	File ID:	013F1301.D
Sampled:	07/28/14 11:50	Prepared:	08/05/14 08:45	Analyzed:	08/06/14 15:47
Solids:	60.30	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04016	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.1	17.5	52.4	U
12674-11-2	Aroclor-1016		6.56	13.1	26.3	U
11104-28-2	Aroclor-1221		6.56	13.1	26.3	U
11141-16-5	Aroclor-1232		6.56	13.1	26.3	U
53469-21-9	Aroclor-1242		6.56	13.1	26.3	U
12672-29-6	Aroclor-1248		6.56	13.1	26.3	U
11097-69-1	Aroclor-1254		6.56	13.1	26.3	U
11096-82-5	Aroclor-1260		6.56	13.1	26.3	U
37324-23-5	Aroclor-1262		6.56	13.1	26.3	U
11100-14-4	Aroclor-1268		6.56	13.1	26.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.21	19.22	73.3	70 - 125	
Tetrachloro-m-xylene [2C]	26.21	19.17	73.1	70 - 125	
Decachlorobiphenyl	26.21	18.60	71.0	60 - 125	
Decachlorobiphenyl [2C]	26.21	18.91	72.2	60 - 125	

014

ANALYSIS DATA SHEET

VWW06-SD053-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU6	
Matrix:	Solid	Laboratory ID:	1407217-08	File ID:	016F1601.D
Sampled:	07/28/14 11:55	Prepared:	08/05/14 08:45	Analyzed:	08/06/14 16:26
Solids:	59.94	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04016	Sequence:	4H21905	Calibration:	4209006
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	QL	LOD	LOQ	Q
NA	Total PCBs		13.7	18.2	54.7	U
12674-11-2	Aroclor-1016		6.85	13.7	27.4	U
11104-28-2	Aroclor-1221		6.85	13.7	27.4	U
11141-16-5	Aroclor-1232		6.85	13.7	27.4	U
53469-21-9	Aroclor-1242		6.85	13.7	27.4	U
12672-29-6	Aroclor-1248		6.85	13.7	27.4	U
11097-69-1	Aroclor-1254		6.85	13.7	27.4	U
11096-82-5	Aroclor-1260		6.85	13.7	27.4	U
37324-23-5	Aroclor-1262		6.85	13.7	27.4	U
11100-14-4	Aroclor-1268		6.85	13.7	27.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.37	22.33	81.6	70 - 125	
Tetrachloro-m-xylene [2C]	27.37	23.17	84.7	70 - 125	
Decachlorobiphenyl	27.37	22.74	83.1	60 - 125	
Decachlorobiphenyl [2C]	27.37	23.21	84.8	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD053-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-09	File ID:	017F1701.D
Sampled:	07/28/14 12:00	Prepared:	08/05/14 08:45	Analyzed:	08/06/14 16:39
Solids:	54.25	Preparation:	EXT_3546	Dilution:	1

Batch: 4H04016 Sequence: 4H21905 Calibration: 4209006 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.6	19.5	58.5	U
12674-11-2	Aroclor-1016		7.32	14.6	29.3	U
11104-28-2	Aroclor-1221		7.32	14.6	29.3	U
11141-16-5	Aroclor-1232		7.32	14.6	29.3	U
53469-21-9	Aroclor-1242		7.32	14.6	29.3	U
12672-29-6	Aroclor-1248		7.32	14.6	29.3	U
11097-69-1	Aroclor-1254		7.32	14.6	29.3	U
11096-82-5	Aroclor-1260		7.32	14.6	29.3	U
37324-23-5	Aroclor-1262		7.32	14.6	29.3	U
11100-14-4	Aroclor-1268		7.32	14.6	29.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.26	21.28	72.7	70 - 125	
Tetrachloro-m-xylene [2C]	29.26	21.87	74.7	70 - 125	
Decachlorobiphenyl	29.26	20.90	71.4	60 - 125	
Decachlorobiphenyl [2C]	29.26	21.42	73.2	60 - 125	

JBC 10/20/14

026

ANALYSIS DATA SHEET

VWW06-SD052-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-10	File ID:	066F6601.D
Sampled:	07/28/14 13:00	Prepared:	08/05/14 08:45	Analyzed:	08/08/14 07:18
Solids:	57.84	Preparation:	EXT 3546	Dilution:	1
Batch:	4H04016	Sequence: 4H22505	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	32.5	14.2	19.0	56.9	J, P, 2C
12674-11-2	Aroclor-1016		7.12	14.2	28.5	U
11104-28-2	Aroclor-1221		7.12	14.2	28.5	U
11141-16-5	Aroclor-1232		7.12	14.2	28.5	U
53469-21-9	Aroclor-1242 [2C]		7.12	14.2	28.5	U
12672-29-6	Aroclor-1248		7.12	14.2	28.5	U
11097-69-1	Aroclor-1254 [2C]	32.5	7.12	14.2	28.5	J, P, 2C
11096-82-5	Aroclor-1260		7.12	14.2	28.5	U
37324-23-5	Aroclor-1262		7.12	14.2	28.5	U
11100-14-4	Aroclor-1268		7.12	14.2	28.5	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	28.47	23.95	84.1	70 - 125	
Tetrachloro-m-xylene [2C]	28.47	23.30	81.8	70 - 125	
Decachlorobiphenyl	28.47	24.00	84.3	60 - 125	
Decachlorobiphenyl [2C]	28.47	24.97	87.7	60 - 125	

JAC 10/20/14

017

ANALYSIS DATA SHEET

VWW06-SD052-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-11	File ID:	022F2201.D
Sampled:	07/28/14 13:05	Prepared:	08/05/14 08:45	Analyzed:	08/06/14 17:44
Solids:	64.39	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04016	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		12.7	17.0	50.9	U
12674-11-2	Aroclor-1016		6.37	12.7	25.5	U
11104-28-2	Aroclor-1221		6.37	12.7	25.5	U
11141-16-5	Aroclor-1232		6.37	12.7	25.5	U
53469-21-9	Aroclor-1242		6.37	12.7	25.5	U
12672-29-6	Aroclor-1248		6.37	12.7	25.5	U
11097-69-1	Aroclor-1254		6.37	12.7	25.5	U
11096-82-5	Aroclor-1260		6.37	12.7	25.5	U
37324-23-5	Aroclor-1262		6.37	12.7	25.5	U
11100-14-4	Aroclor-1268		6.37	12.7	25.5	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	25.46	21.73	85.3	70 - 125	
Tetrachloro-m-xylene [2C]	25.46	22.43	88.1	70 - 125	
Decachlorobiphenyl	25.46	21.44	84.2	60 - 125	
Decachlorobiphenyl [2C]	25.46	21.88	85.9	60 - 125	

018

ANALYSIS DATA SHEET

VWW06-SD052-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-12	File ID	023F2301.D
Sampled:	07/28/14 13:10	Prepared:	08/05/14 08:45	Analyzed:	08/06/14 17:57
Solids:	54.95	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04016	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.9	19.9	59.6	U
12674-11-2	Aroclor-1016		7.46	14.9	29.9	U
11104-28-2	Aroclor-1221		7.46	14.9	29.9	U
11141-16-5	Aroclor-1232		7.46	14.9	29.9	U
53469-21-9	Aroclor-1242		7.46	14.9	29.9	U
12672-29-6	Aroclor-1248		7.46	14.9	29.9	U
11097-69-1	Aroclor-1254		7.46	14.9	29.9	U
11096-82-5	Aroclor-1260		7.46	14.9	29.9	U
37324-23-5	Aroclor-1262		7.46	14.9	29.9	U
11100-14-4	Aroclor-1268		7.46	14.9	29.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.82	26.70	89.5	70 - 125	
Tetrachloro-m-xylene [2C]	29.82	27.85	93.4	70 - 125	
Decachlorobiphenyl	29.82	25.46	85.4	60 - 125	
Decachlorobiphenyl [2C]	29.82	25.80	86.5	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD052-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-13	File ID:	024F2401.D
Sampled:	07/28/14 13:15	Prepared:	08/05/14 08:45	Analyzed:	08/06/14 18:10
Solids:	52.43	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04016	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.1	20.1	60.2	U
12674-11-2	Aroclor-1016		7.54	15.1	30.2	U
11104-28-2	Aroclor-1221		7.54	15.1	30.2	U
11141-16-5	Aroclor-1232		7.54	15.1	30.2	U
53469-21-9	Aroclor-1242		7.54	15.1	30.2	U
12672-29-6	Aroclor-1248		7.54	15.1	30.2	U
11097-69-1	Aroclor-1254		7.54	15.1	30.2	U
11096-82-5	Aroclor-1260		7.54	15.1	30.2	U
37324-23-5	Aroclor-1262		7.54	15.1	30.2	U
11100-14-4	Aroclor-1268		7.54	15.1	30.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.12	21.38	71.0	70 - 125	
Tetrachloro-m-xylene [2C]	30.12	22.28	74.0	70 - 125	
Decachlorobiphenyl	30.12	19.33	64.2	60 - 125	
Decachlorobiphenyl [2C]	30.12	19.70	65.4	60 - 125	

JJC 10/2014

ANALYSIS DATA SHEET

VWW06-SD051-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-14	File ID:	067F6701.D
Sampled:	07/28/14 14:00	Prepared:	08/05/14 08:45	Analyzed:	08/08/14 07:31
Solids:	60.39	Preparation:	EXT 3546	Dilution:	1
Batch:	4H04016	Sequence:	4H22505	Calibration:	4209006
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	34.5	13.1	17.5	52.5	J [illegible]
12674-11-2	Aroclor-1016		6.58	13.1	26.4	U
11104-28-2	Aroclor-1221		6.58	13.1	26.4	U
11141-16-5	Aroclor-1232		6.58	13.1	26.4	U
53469-21-9	Aroclor-1242		6.58	13.1	26.4	U
12672-29-6	Aroclor-1248		6.58	13.1	26.4	U
11097-69-1	Aroclor-1254 [2C]	34.5	6.58	13.1	26.4	J [illegible]
11096-82-5	Aroclor-1260		6.58	13.1	26.4	U
37324-23-5	Aroclor-1262		6.58	13.1	26.4	U
11100-14-4	Aroclor-1268		6.58	13.1	26.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.30	24.29	92.4	70 - 125	
Tetrachloro-m-xylene [2C]	26.30	23.43	89.1	70 - 125	
Decachlorobiphenyl	26.30	22.83	86.8	60 - 125	
Decachlorobiphenyl [2C]	26.30	23.89	90.8	60 - 125	

[illegible] 10/20/14

ANALYSIS DATA SHEET

VWW06-SD05I-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-15	File ID:	026F2601.D
Sampled:	07/28/14 14:05	Prepared:	08/05/14 08:45	Analyzed:	08/06/14 18:36
Solids:	58.82	Preparation:	EXT_2546	Dilution:	1

Batch: 4H04016 Sequence: 4H21905 Calibration: 4209006 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.5	18.0	54.0	~~U~~ U ~~BSL~~
12674-11-2	Aroclor-1016		6.77	13.5	27.1	U
11104-28-2	Aroclor-1221		6.77	13.5	27.1	U
11141-16-5	Aroclor-1232		6.77	13.5	27.1	U
53469-21-9	Aroclor-1242		6.77	13.5	27.1	U
12672-29-6	Aroclor-1248		6.77	13.5	27.1	U
11097-69-1	Aroclor-1254		6.77	13.5	27.1	U
11096-82-5	Aroclor-1260		6.77	13.5	27.1	U
37324-23-5	Aroclor-1262		6.77	13.5	27.1	U
11100-14-4	Aroclor-1268		6.77	13.5	27.1	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.04	17.89	66.2	70 - 125	
Tetrachloro-m-xylene [2C]	27.04	18.12	67.0	70 - 125	
Decachlorobiphenyl	27.04	17.42	64.4	60 - 125	
Decachlorobiphenyl [2C]	27.04	17.61	65.1	60 - 125	

JJC 10/30/14

022

ANALYSIS DATA SHEET

VWW06-SD051-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-16	File ID:	027F2701.D
Sampled:	07/28/14 14:10	Prepared:	08/05/14 08:45	Analyzed:	08/06/14 18:49
Solids:	60.28	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04016	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.7	18.2	34.6	U
12674-11-2	Aroclor-1016		6.84	13.7	27.4	U
11104-28-2	Aroclor-1221		6.84	13.7	27.4	U
11141-16-5	Aroclor-1232		6.84	13.7	27.4	U
53469-21-9	Aroclor-1242		6.84	13.7	27.4	U
12672-29-6	Aroclor-1248		6.84	13.7	27.4	U
11097-69-1	Aroclor-1254		6.84	13.7	27.4	U
11096-82-5	Aroclor-1260		6.84	13.7	27.4	U
37324-23-5	Aroclor-1262		6.84	13.7	27.4	U
11100-14-4	Aroclor-1268		6.84	13.7	27.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.34	22.59	82.6	70 - 125	
Tetrachloro-m-xylene [2C]	27.34	22.66	82.9	70 - 125	
Decachlorobiphenyl	27.34	22.33	81.7	60 - 125	
Decachlorobiphenyl [2C]	27.34	22.21	81.2	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD051-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407217-17	File ID:	028F2801.D
Sampled:	07/28/14 14:15	Prepared:	08/05/14 08:45	Analyzed:	08/06/14 19:02
Solids:	63.22	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04016	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		12.7	16.9	50.6	~~U~~ 552
12674-11-2	Aroclor-1016		6.34	12.7	25.4	U
11104-28-2	Aroclor-1221		6.34	12.7	25.4	U
11141-16-5	Aroclor-1232		6.34	12.7	25.4	U
53469-21-9	Aroclor-1242		6.34	12.7	25.4	U
12672-29-6	Aroclor-1248		6.34	12.7	25.4	U
11097-69-1	Aroclor-1254		6.34	12.7	25.4	U
11096-82-5	Aroclor-1260		6.34	12.7	25.4	U
37324-23-5	Aroclor-1262		6.34	12.7	25.4	U
11100-14-4	Aroclor-1268		6.34	12.7	25.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	25.33	16.50	65.1	70 - 125	*
Tetrachloro-m-xylene [2C]	25.33	16.77	66.2	70 - 125	*
Decachlorobiphenyl	25.33	16.79	66.3	60 - 125	
Decachlorobiphenyl [2C]	25.33	16.78	66.2	60 - 125	

JAC 10/30/14

024

ANALYSIS DATA SHEET

VWW06-EB01-072914

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Water	Laboratory ID:	1407217-18	File ID:	029F2901.D
Sampled:	07/29/14 06:30	Prepared:	08/04/14 15:17	Analyzed:	08/04/14 23:20
Solids:		Preparation:	EXT_3510	Dilution:	1
Batch:	4H04012	Sequence: 4H21803	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/L)	DL	LOD	LOQ	Q
NA	Total PCBs		0.120	0.250	0.500	UJ U SSL
12674-11-2	Aroclor-1016		0.120	0.250	0.500	U
11104-28-2	Aroclor-1221		0.120	0.250	0.500	U
11141-16-5	Aroclor-1232		0.120	0.250	0.500	U
53469-21-9	Aroclor-1242		0.120	0.250	0.500	U
12672-29-6	Aroclor-1248		0.120	0.250	0.500	U
11097-69-1	Aroclor-1254		0.120	0.250	0.500	U
11096-82-5	Aroclor-1260		0.120	0.250	0.500	U
37324-23-5	Aroclor-1262		0.120	0.250	0.500	U
11100-14-4	Aroclor-1268		0.120	0.250	0.500	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	0.5000	0.2343	46.9	25 - 140	
Tetrachloro-m-xylene [2C]	0.5000	0.2430	48.6	25 - 140	
Decachlorobiphenyl	0.5000	0.1553	31.1	40 - 135	*
Decachlorobiphenyl [2C]	0.5000	0.1672	33.4	40 - 135	*

JC 10/20/14

625

ANALYSIS DATA SHEET

VWW06-SD053-2430 NJ

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H04016-MS1	File ID:	014F1401.D
Sampled:		Prepared:		Analyzed:	08/06/14 16:00
Solids:		Preparation:	EXT_3546	Dilution:	
Batch:	4H04016	Sequence:	4H21905	Calibration:	4209006
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		6.79	13.6	27.2	U
11104-28-2	Aroclor-1221		6.79	13.6	27.2	U
11141-16-5	Aroclor-1232		6.79	13.6	27.2	U
53469-21-9	Aroclor-1242		6.79	13.6	27.2	U
12672-29-6	Aroclor-1248		6.79	13.6	27.2	U
11097-69-1	Aroclor-1254	457.1	6.79	13.6	27.2	
11096-82-5	Aroclor-1260		6.79	13.6	27.2	U
37324-23-5	Aroclor-1262		6.79	13.6	27.2	U
11100-14-4	Aroclor-1268		6.79	13.6	27.2	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.15	27.03	99.6	70 - 125	
Decachlorobiphenyl	27.15	24.97	92.0	60 - 125	

026

ANALYSIS DATA SHEET

VWW06-SD053-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M HILL, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H04016-MS1	File ID:	014R1401.D
Sampled:		Prepared:		Analyzed:	08/06/14 16:00
Solids:		Preparation:	EXT 3546	Dilution:	

Batch: 4H04016 Sequence: 4H21905 Calibration: 4209006 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		6.79	13.6	27.2	U
11104-28-2	Aroclor-1221 [2C]		6.79	13.6	27.2	U
11141-16-5	Aroclor-1232 [2C]		6.79	13.6	27.2	U
53469-21-9	Aroclor-1242 [2C]		6.79	13.6	27.2	U
12672-29-6	Aroclor-1248 [2C]		6.79	13.6	27.2	U
11097-69-1	Aroclor-1254 [2C]	**490.1**	6.79	13.6	27.2	
11096-82-5	Aroclor-1260 [2C]		6.79	13.6	27.2	U
37324-23-5	Aroclor-1262 [2C]		6.79	13.6	27.2	U
11100-14-4	Aroclor-1268 [2C]		6.79	13.6	27.2	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	27.15	27.29	101	70 - 125	
Decachlorobiphenyl [2C]	27.15	25.48	93.8	60 - 125	

SAC 10/25/14

027

ANALYSIS DATA SHEET

VWW06-SD053-2430 MSD

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H04016-MSD1	File ID:	015F1501.D
Sampled:		Prepared:		Analyzed:	08/06/14 16:13
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H04016 Sequence: 4H21905 Calibration: 4209006 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		6.50	13.0	26.0	U
11104-28-2	Aroclor-1221		6.50	13.0	26.0	U
11141-16-5	Aroclor-1232		6.50	13.0	26.0	U
53469-21-9	Aroclor-1242		6.50	13.0	26.0	U
12672-29-6	Aroclor-1248		6.50	13.0	26.0	U
11097-69-1	Aroclor-1254	436.2	6.50	13.0	26.0	
11096-82-5	Aroclor-1260		6.50	13.0	26.0	U
37324-23-5	Aroclor-1262		6.50	13.0	26.0	U
11100-14-4	Aroclor-1268		6.50	13.0	26.0	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	25.96	26.15	101	70 - 125	
Decachlorobiphenyl	25.96	22.41	86.3	60 - 125	

JAC 10-25-14

128

ANALYSIS DATA SHEET

VWW06-SD053-2430 MSD

Laboratory:	Empirical Laboratories, LLC		SDG:	1407217	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H04016-MSD1	File ID:	015R1501.D
Sampled:		Prepared:		Analyzed:	08/06/14 16:13
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H04016 Sequence: 4H21905 Calibration: 4209006 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		6.50	13.0	26.0	U
11104-28-2	Aroclor-1221 [2C]		6.50	13.0	26.0	U
11141-16-5	Aroclor-1232 [2C]		6.50	13.0	26.0	U
53469-21-9	Aroclor-1242 [2C]		6.50	13.0	26.0	U
12672-29-6	Aroclor-1248 [2C]		6.50	13.0	26.0	U
11097-69-1	Aroclor-1254 [2C]	454.5	6.50	13.0	26.0	
11096-82-5	Aroclor-1260 [2C]		6.50	13.0	26.0	U
37324-23-5	Aroclor-1262 [2C]		6.50	13.0	26.0	U
11100-14-4	Aroclor-1268 [2C]		6.50	13.0	26.0	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	25.96	26.65	103	70 - 125	
Decachlorobiphenyl [2C]	25.96	22.90	88.2	60 - 125	

629

ANALYSIS DATA SHEET

VWW06-SD054-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/28/14 10:00
% Solids: 52.73

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-01
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	142	0.542	1.08	1.81	1	JH MGH	SW6010C	4G30021	07/31/14 15:09
7440-66-6	Zinc	247	1.81	3.61	7.22	1	JH MGH	SW6010C	4G30021	07/31/14 15:09

MC 10/20/14

ANALYSIS DATA SHEET

VWW06-SD054-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/28/14 10:05
% Solids: 57.74

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-02
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.37	0.525	1.05	1.75	1	J	SW6010C	4H11023	08/18/14 15:53
7440-66-6	Zinc	4.69	3.50	7.00	14.0	2	JD	SW6010C	4H11023	08/19/14 11:34

JLC 10/30/14

031

ANALYSIS DATA SHEET

VWW06-SD054-5460

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/28/14 10:10
% Solids: 44.34

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-03
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.35	0.657	1.21	2.19	1	J J01	SW6010C	4H11023	08/18/14 15:57
7440-66-6	Zinc	9.56	4.38	8.76	15	2	J J01	SW6010C	4H11023	08/19/14 11:39

SJC 10/20/14

ANALYSIS DATA SHEET

VWW06-SD054-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc
Matrix: Solid
Sampled: 07/28/14 10:15
% Solids: 57.29

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-04
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.44	0.504	1.01	1.68	1	J	SW6010C	4H11023	08/18/14 16:02
7440-66-6	Zinc	8.90	3.36	6.71	13.4	2	JB	SW6010C	4H11023	08/19/14 11:43

033

ANALYSIS DATA SHEET

VWW06-SD054P-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/28/14 10:20
% Solids: 57.35

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-05
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.27	0.503	1.01	1.68	1	J	SW6010C	4H11023	08/18/14 16:06
7440-66-6	Zinc	11.3	3.35	6.71	13.4	2	JD	SW6010C	4H11023	08/19/14 11:48

ANALYSIS DATA SHEET

VWW06-SD053-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/28/14 11:45
% Solids: 50.74

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-06
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	240	0.603	1.21	2.01	1		SW6010C	4H11023	08/18/14 16:11
7440-66-6	Zinc	377	2.01	4.02	8.04	1		SW6010C	4H11023	08/18/14 16:11

JMC 10/2014

035

ANALYSIS DATA SHEET

VWW06-SD053-2430

Laboratory:	Empirical Laboratories, LLC	SDG:	1407217
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1407217-07
Sampled:	07/28/14 11:50	Received:	07/30/14 08:50
% Solids:	60.30		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.03	0.498	0.995	1.66	1	J	SW6010C	4H11023	08/18/14 10:15
7440-66-6	Zinc	5.76	3.32	6.63	13.3	2	JD	SW6010C	4H11023	08/19/14 11:53

JPC 10/30/14

ANALYSIS DATA SHEET

VWW06-SD053-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/28/14 11:55
% Solids: 59.94

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-08
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.08	0.501	1.00	1.67	1	J	SW6010C	4H11023	08/18/14 16:20
7440-66-6	Zinc	8.91	3.34	6.67	13.3	2	JB	SW6010C	4H11023	08/19/14 11:57

SJC 10/30/14

037

ANALYSIS DATA SHEET

VWW06-SD053-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/28/14 12:00
% Solids: 54.25

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-09
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.23	0.542	1.08	1.81	1	J	SW6010C	4H11023	08/18/14 16:24
7440-66-6	Zinc	7.84	3.61	7.23	14.5	2	JB	SW6010C	4H11023	08/19/14 12:02

JLC 10/30/14

ANALYSIS DATA SHEET

VWW06-SD052-0006

Laboratory:	Empirical Laboratories, LLC	SDG:	1407217
Client:	CH2M Hill, Inc	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1407217-10
Sampled:	07/28/14 13:00	Received:	07/30/14 08:50
% Solids:	57.84		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	73.4	0.519	1.04	1.73	1		SW6010C	4H11023	08/18/14 16:29
7440-66-6	Zinc	283	1.73	3.46	6.92	1		SW6010C	4H11023	08/18/14 16:29

JAC 10/30/14

039

ANALYSIS DATA SHEET

VWW06-SD052-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/28/14 13:05
% Solids: 64.39

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-11
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.09	0.461	0.923	1.34	1	J	SW6010C	4H11023	08/18/14 16:34
7440-66-6	Zinc	5.31	3.08	6.15	12.3	2	JB	SW6010C	4H11023	08/19/14 12:06

ANALYSIS DATA SHEET

VWW06-SD052-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc
Matrix: Solid
Sampled: 07/28/14 13:10
% Solids: 54.95

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-12
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.47	0.546	1.09	1.82	1	J	SW6040C	4H11023	08/18/14 17:02
7440-66-6	Zinc		3.64	7.28	14.6	2	U	SW6010C	4H11023	08/19/14 12:11

JMC 10/20/14

041

ANALYSIS DATA SHEET

VWW06-SD052-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/28/14 13:15
% Solids: 52.43

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-13
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.41	0.561	1.12	1.87	1	J	SW6010C	41011023	08/18/14 17:07
7440-66-6	Zinc	11.6	3.74	7.48	15.0	2	JB	SW6010C	41011023	08/19/14 12:15

SMC 10/2014

042

ANALYSIS DATA SHEET

VWW06-SD051-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/28/14 14:00
% Solids: 60.39

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-14
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	74.6	0.478	0.955	1.59	1		SW6010C	4H11023	08/18/14 17:11
7440-66-6	Zinc	113	1.59	3.18	6.37	1		SW6010C	4H11023	08/18/14 17:11

GAC 12/2014

143

ANALYSIS DATA SHEET

VWW06-SD051-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/28/14 14:05
% Solids: 58.82

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-15
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	0.924	0.495	0.990	1.65	1	J	SW6010C	4H11023	08/18/14 17:16
7440-66-6	Zinc	5.65	3.30	6.60	13.2	2	JD	SW6010C	4H11023	08/19/14 12:33

ANALYSIS DATA SHEET

VWW06-SD051-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/28/14 14:10
% Solids: 60.28

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-16
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.01	0.493	0.986	1.64	1	J	SW6010C	4H11023	08/18/14 17:20
7440-66-6	Zinc	3.98	3.29	6.57	13.1	2	JB	SW6010C	4H11022	08/19/14 12:37

045

ANALYSIS DATA SHEET

VWW06-SD051-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/28/14 14:15
% Solids: 63.22

SDG: 1407217
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407217-17
Received: 07/30/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.36	0.475	0.949	1.58	1	J	SW6010C	4H11023	08/18/14 17:25
7440-66-6	Zinc	7.22	3.16	6.33	12.7	2	JD	SW6010C	4H11023	08/19/14 12:42

ANALYSIS DATA SHEET

VWW06-EB01-072914

Laboratory:	Empirical Laboratories, LLC	SDG:	1407217
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Water	Laboratory ID:	1407217-18
Sampled:	07/29/14 06:30	Received:	07/30/14 08:50

CAS NO.	Analyte	Conc. (ug/L)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead		1.50	3.00	5.00	1	U	SW6010C	4H11011	08/18/14 13:34
7440-66-6	Zinc		5.00	10.0	20.0	1	U	SW6010C	4H11011	08/18/14 13:34

JAC 11-25-14

047

ANALYSIS DATA SHEET

VWW06-SD054-0006

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 52.73

SDG: 1407217

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4G30021-DUP1

CAS NO	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	144.0	2.71	5.42	9.03	5	U	SW6010C	4G30021	07/31/14 15:27
7440-66-6	Zinc	239.3	9.03	18.1	36.1	5	U	SW6010C	4G30021	07/31/14 15:27

048

ANALYSIS DATA SHEET

VWW06-SD054-0006 MS

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 32.73

SDG: 1407217

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4G30021-MSD1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	219.9	0.549	1.09	1.82	1		SW6010C	4G30021	07/31/14 15:18
7440-66-6	Zinc	420.2	1.82	3.65	7.29	1		SW6010C	4G30021	07/31/14 15:18

JC 10/5/14

049

ANALYSIS DATA SHEET

VWW06-SD054-0006 MSD

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 52.73

SDG: 1407217

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4G30021-MS1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	252.6	0.542	1.08	1.81			SW6010C	4G30021	07/31/14 15:14
7440-66-6	Zinc	483.2	1.81	3.61	7.22	1		SW6010C	4G30021	07/31/14 15:14

SAC
10/25/14

050

Sample Delivery Group Case Narrative

Receipt Information:

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision:

Revision 01: The package was revised to replace the "matrix spike", "matrix spike duplicate", and "duplicate" on the Analysis Data Sheets with the client ID of the parent sample at the request of the client.

Analytical Information:

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. Sample preparation and dilution information is provided within the final results report and at the beginning of each form set. The following information is provided specific to individual methods:

SW8082B:

Note – Sample 1407217-01 is qualified with a C9 for Aroclor-1016, Aroclor-1232, Aroclor-1242, and Aroclor-1248 to indicate that the DL and LOD were raised due to sample matrix interference and sample 1407217-06is qualified with a C9 for Aroclor-1016, Aroclor-1232, Aroclor-1242, and Aroclor-1248 to indicate that the DL, LOD, and LOQ were raised due to sample matrix interference.

The following surrogates exceeded criteria:
Tetrachloro-m-xylene with a negative bias on both columns in 1407217-15, -17
Decachlorobiphenyl with a negative bias on both columns in 1407217-18
Note – The samples with surrogate exceedences were not re-extracted since 2 or more surrogates were within criteria.

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

151

spike is within criteria

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

052

Data Qualifiers:

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

DL: The detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is supported by the method detection limit (MDL) which is determined from analysis of a sample containing the analyte in a given matrix.

LOD: The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM 4.2 revisions as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

LOQ: The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM 4.2 as the lowest concentration that produces a quantitative result within specified limits of precision and bias.

***:** Exceeding quality control criteria are associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. For Metals, the qualifier indicates that the serial dilution was outside of the control limits and the compound should be considered estimated due to the presence of interference.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time.

H3: The sample for this analyte was received outside of the EPA recommended holding time.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the LOQ. One should feel confident that the result is greater than zero and less than the LOQ.

053

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it indicates that the parameters DL/LOD/LOQ have been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The relative percent difference (RPD) and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

S: The associated internal standard exceeded criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

Z: The parameter shows lack of confirmation/detection, which may be due to a negative bias in the ICV or CCV which exceeds the lower control limit.

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.

B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.

C: The peak was manually integrated to correct the baseline from the original chromatogram.

D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.

E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

LIMS Definitions / Naming Conventions:

The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK

054

appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And **"RE"** implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, the Data Quality Manager, Technical Directors or Project Managers are authorized to sign this Statement of Data Authenticity.

Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

055

1407217

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 • Nashville, TN 37228 • 877-345-1113 • (fax) 866-417-0548

23275 P. 1 of 2

Send Results to:	Send Invoice to:
Name Juliana Dean	Name SAME
Company CH2M Hill	Company
Address 5701 Cleveland St Suite 200	Address
City Virginia Beach	City
State, Zip VA 23462	State, Zip
Phone 757 671 6232	Phone
Fax	Fax
E-mail juliana.dean@ch2m.com	E-mail
Project No./Name: VIE2065 - Site 6	Sampler's (Signature): John R Martin

Analysis Requirements: Metals 6010C; PCB 8082A

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres.
01	7/28/14 1000	VWW06-SD054-0006	SD	✓	✓		2	
02	7/28/14 1005	VWW06-SD054-2430	SD	✓	✓		2	
03	7/28/14 1010	VWW06-SD054-5460	SD	✓	✓		2	
04	7/28/14 1015	VWW06-SD054-7278	SD	✓	✓		2	
05	7/28/14 1020	VWW06-SD054P-7275	SD	✓	✓		2	
06	7/28/14 1145	VWW06-SD053-0006	SD	✓	✓		2	
07	7/28/14 1150	VWW06-SD053-2430	SD	✓	✓		2	
08	7/28/14 1155	VWW06-SD053-4854	SD	✓	✓		2	
09	7/28/14 1200	VWW06-SD053-7278	SD	✓	✓		2	
10	7/28/14 1300	VWW06-SD052-0006	SD	✓	✓		2	
11	7/28/14 1305	VWW06-SD052-2430	SD	✓	✓		2	
12	7/28/14 1310	VWW06-SD052-4854	SD	✓	✓		2	

Relinquished by: (Signature)	Date/Time	Received By: (Signature)
John R Martin	0645 7/29/14	
Relinquished by: (Signature)	Date/Time	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time	Temperature
[signature]	0850 7/30/14	1.3

REMARKS:

Details:

Page ____ of ____

Cooler No ____ of ____

Date Shipped ____

Shipped By ____

Turnaround ____

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

1407217

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SHIP TO: 621 Mainstream Drive, Suite 270 • Nashville, TN 37228 • 877-345-1113 • (fax) 866-417-0548

23276 p. 2 of 2

Send Results to:
Name Juliana Dean
Company CH2M Hill
Address 5701 Cleveland St Suite 200
City Virginia Beach
State, Zip VA 23462
Phone 757 671 6232
Fax
E-mail juliana.dean@ch2m.com

Send Invoice to:
Name SAME
Company
Address
City
State, Zip
Phone
Fax
E-mail

Analysis Requirements:
Metals 6010C
PCB 8082A

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:
CAR #:

Project No./Name: VIEQUES SWMU 6

Sampler's (Signature): John M Martin

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres
13	7/28/14 1315	VWW06-SD052-7278	SD	✓	✓		2	
14	7/28/14 1400	VWW06-SD051-0006	SD	✓	✓		2	
15	7/28/14 1405	VWW06-SD051-2430	SD	✓	✓		2	
16	7/28/14 1410	VWW06-SD051-4854	SD	✓	✓		2	
17	7/28/14 1415	VWW06-SD051-7278	SD	✓	✓		2	
18	7/29/14 0630	VWW06-EB01-072914	AQ	✓	✓		3	

Relinquished by: (Signature)	Date/Time	Received By: (Signature)
John M Martin	0645 7/29/14	
Relinquished by: (Signature)	Date/Time	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time	Temperature:
[illegible]	0850 7/30/14	1.3

REMARKS:

Details
Page ____ of ____
Cooler No. ____ of ____
Date Shipped ____
Shipped By ____
Turnaround ____

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 07/30/14 0850 Workorder# 1407217

1. Tracking # 8084 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: 1.6 °C + correction factor (-0.3) = 1.3 °C

3. If item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO (NA)

4. Were custody seals on outside of cooler? (YES) NO NA

   If yes, how many and where: 2, Front + back

5. Were the seals intact, signed, and dated correctly? (YES) NO NA

6. Were custody papers inside cooler? (YES) NO NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) JTG 7/30/14

7. Were custody seals on containers: YES (NO) and intact YES NO (NA)

   Were these signed and dated correctly? YES NO (NA)

8. Packing material used? (Bubblewrap) (Plastic bag) Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: (Ice) Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES) NO NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES) NO NA

12. Did all container labels and tags agree with custody papers? (YES) NO NA

13. a. Were VOA vials received? YES NO (NA) JTG 7/30/14

    b. Was there any observable headspace present in any VOA vial? YES NO (NA)

14. Was there a Trip Blank in this cooler? YES (NO) NA If multiple coolers, sequence # ____

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) JTG 7/30/14

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? (YES) NO (NA) JTG 7/30/14

    b. Did the bottle labels indicate that the correct preservatives were used (YES) NO NA

16. Was residual chlorine present? YES NO (NA)

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) JTG 7/30/14

17. Were custody papers properly filled out (ink, signed, etc)? (YES) NO NA

18. Did you sign the custody papers in the appropriate place? (YES) NO NA

19. Were correct containers used for the analysis requested? (YES) NO NA

20. Was sufficient amount of sample sent in each container? (YES) NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial/date) JTG 7/30/14

I certify that I attached a label with the unique LIMS number to each container (initial/date) JTG 7/30/14

I certify that I have performed a second check of the LIMS information against the COC to confirm accuracy (initial/date) ____

21. Were there Non-Conformance issues at login? YES (NO) Was a NCR generated? YES (NO) #____

Additional Details:

Holding Times

Sampling Date: 7/28-7/29
Received Date: 7/30
Extraction Date: 8/4, 8/5 – PCBs
Analysis Dates: 8/4, 8/6, 8/86 – PCBs

The samples in this SDG were validated according to the recommendations in the Region II SOP NO. HW-37 Rev 3, 5/2013 and the QC limits published in the project specific SAP.

Receipt paperwork was in order. Cooler temperatures were acceptable. A seven-day holding time was used for the water samples and a fourteen-day holding time was used for the soil samples. The analysis holding time of 40 days was used. Based on this, all extraction and analysis holding times were met.

All samples exhibited percent solids values >30% so no qualifications were required.

Calibrations

8082 PCB: Initial calibrations were performed according to the method with a six-point curve for AR1016, AR1242, AR1254, & AR1260 as the representative PCBs. Response factors were calculated. %RSDs were within QC limits. All ICV criteria were met (avg. %Ds were met). Continuing calibration standards were analyzed appropriately (for 1016, 1242 & 1260). All CCVs exhibited acceptable %Ds (avg. %Ds were met). Column resolution was acceptable. Standard retention times were stable throughout the analytical sequences. The correct analytical sequences were run. Raw data and calculations were verified.

Blank Summary

Blank qualification guidelines:

- No action is taken if a compound is found in the blank but not in the sample.
- Any compound detected in the sample, and the associated blank, must be qualified by reporting the result in the sample as non-detect at the LOD when the sample concentration is less than LOD.
- Sample weight, volume or dilution factor must be taken into consideration when applying the qualification criteria.
- Apply the same data validation guidelines to any associated rinse and field blanks and all associated samples.
- Qualification/Action codes:
  - No Action - The sample result is greater than the LOD and greater than five times (5X) the blank value.
  - U at LOD- The sample result is less than the LOD when the blank contamination level is less than the LOD.

Professional judgment is applied when blank concentrations are >LOD. Results may be flagged as U at the reported concentration or rejected. No contamination that resulted in qualification of the data was noted in the associated method or instrument blanks or the submitted field QC blanks.

Blank ID	Compound	Concentration	Action Level	Q Flag
no contamination was noted				

Surrogate Recoveries

Surrogate recoveries did not meet criteria in three of the samples in this SDG. Samples VWW06-EB01-072914, VWW06-SD051-2430 and VWW06-SD051-7278 are qualified as estimated J-/UJ due to low surrogate recoveries.

Matrix Spike/Matrix Spike Duplicates

The MS/MSD sample analyzed for this SDG were acceptable for all recoveries and RPDs in the original runs. No qualifications were required.

Laboratory Control Samples

The LCS samples exhibited acceptable recoveries and RPDs. No qualifications were required.

Field Duplicate Sample Summary

There was one field duplicate pair in this SDG. No qualifications were necessary. See the worksheet following this page for details.

Sample Result Verification

Reported sample results were verified. Raw data and calculations were verified. Three reported positive results exhibited column quantitation %D's that were >40%. The results were qualified as estimated J.

Reviewer Jacqueline Cleveland Date: 10/25/14

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD054-7278
Duplicate Sample ID: VWW06-SD054P-7278

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: no positive results reported in either sample

Sample ID:
Duplicate Sample ID:

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS:

Initial Calibration Date: 7/24-25-14, Instrument GL-ECD3

RRF and %RSD Calculations:

Compound Name: Cal3 at 750/75, Std. 14G0434, AR1660 peak 2 in level 3
Lab Value: 2054.3000

Area of Compound	1540725
Conc. of Compound	750
Calculated CF	2054.300

Compound Name: AR1260 Peak 2
Lab Value: 6.4

CF of STD 1	1883.529
CF of STD 2	1962.644
CF of STD 3	2054.300
CF of STD 4	2133.612
CF of STD 5	2036.520
CF of STD 6	2259.440
CF of STD 7	
CF of STD 8	
Calculated % RSD	6.39

Continuing Calibration File ID: 8/6/14, 1953, AR1260 Peak 4

RRF and %D Calculations:

Compound Name: AR1260, peak 4
Lab Value: 1908.9860

Area of Compound	1908986
Conc. of Compound	1000
Calculated CF	1908.986

Compound Name: AR1260, peak 4
Lab Value: 3.0

Average CF	1852.887
CF of CCV	1908.986
Calculated % D	-3.0

SAMPLE CALCULATION - SDG 1407217

Sample ID: VWW06-SD054-0006
Standard ID: ICAL 7/24-25/14
Compound: AR1254
Concentration: 127 ug/Kg (average of at least 3 peaks)
Calculation shows Peak 1: 106.19 ug/Kg

	Water (ug/L)	Soil (ug/Kg)
Area of Compound		220625
CF of Compound		1257.331
Final Volume		5
Dilution Factor		1
Split Factor		1
Injection Volume		1
Weight of Sample	na	15.67
Initial Volume of Sample		NA
Conversion Factor		1
Percent Solids Factor		0.5273
Concentration	#DIV/0!	106.18137

Peak #	Concentration
1	106.19
2	105.11
3	128.89
4	
5	166.71
Total	**126.725**

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Enipirical Laboratories, LLC	SDG:	1407217
Client:	CH2M Hill, Inc	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H21803	Instrument:	GL-ECD3
		Calibration:	4209006

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (4H21803-CCV1) ug/L				Lab File ID: 003F0301.D		Analyzed: 08/04/14 17:40		
Tetrachloro-m-xylene	100.0	98.0	80 - 120	2.494	2.494	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	95.8	80 - 120	2.962	2.962	0.0000	+/-0.030	
Decachlorobiphenyl	100.0	97.6	80 - 120	7.299	7.299	0.0000	+/-0.030	
Decachlorobiphenyl [2C]	100.0	97.1	80 - 120	8.109	8.109	0.0000	+/-0.030	
Calibration Check (4H21803-CCV6) ug/L				Lab File ID: 016F1601.D		Analyzed: 08/04/14 20:29		
Tetrachloro-m-xylene	100.0	97.7	80 - 120	2.491	2.494	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	94.5	80 - 120	2.961	2.962	-0.0010	+/-0.030	
Decachlorobiphenyl	100.0	88.6	80 - 120	7.295	7.299	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	100.0	88.0	80 - 120	8.105	8.109	-0.0040	+/-0.030	
Blank (4H04012-BLK1) ug/L				Lab File ID: 022F2201.D		Analyzed: 08/04/14 21:47		
Tetrachloro-m-xylene	0.5000	75.5	25 - 140	2.49	2.494	-0.0040	+/-0.030	
Tetrachloro-m-xylene [2C]	0.5000	76.0	25 - 140	2.96	2.962	-0.0020	+/-0.030	
Decachlorobiphenyl	0.5000	75.3	40 - 135	7.294	7.299	-0.0050	+/-0.030	
Decachlorobiphenyl [2C]	0.5000	77.0	40 - 135	8.105	8.109	-0.0040	+/-0.030	
LCS (4H04012-BS3) ug/L				Lab File ID: 027F2701.D		Analyzed: 08/04/14 22:53		
Tetrachloro-m-xylene	0.5000	62.1	25 - 140	2.493	2.494	-0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	0.5000	63.7	25 - 140	2.962	2.962	0.0000	+/-0.030	
Decachlorobiphenyl	0.5000	57.3	40 - 135	7.296	7.299	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	0.5000	59.6	40 - 135	8.107	8.109	-0.0020	+/-0.030	
LCS Dup (4H04012-BSD3) ug/L				Lab File ID: 028F2801.D		Analyzed: 08/04/14 23:07		
Tetrachloro-m-xylene	0.5000	66.7	25 - 140	2.493	2.494	-0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	0.5000	68.4	25 - 140	2.961	2.962	-0.0010	+/-0.030	
Decachlorobiphenyl	0.5000	63.6	40 - 135	7.296	7.299	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	0.5000	65.7	40 - 135	8.106	8.109	-0.0030	+/-0.030	
VWW06-EB01-072914 (1407217-18) ug/L				Lab File ID: 029F2901.D		Analyzed: 08/04/14 23:20		
Tetrachloro-m-xylene	0.5000	46.9	25 - 140	2.491	2.494	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	0.5000	48.6	25 - 140	2.961	2.962	-0.0010	+/-0.030	
Decachlorobiphenyl	0.5000	31.1	40 - 135	7.293	7.299	-0.0060	+/-0.030	*
Decachlorobiphenyl [2C]	0.5000	33.4	40 - 135	8.105	8.109	-0.0040	+/-0.030	*
Calibration Check (4H21803-CCVC) ug/L				Lab File ID: 035F3501.D		Analyzed: 08/05/14 00:40		
Tetrachloro-m-xylene	100.0	97.7	80 - 120	2.492	2.494	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	95.9	80 - 120	2.96	2.962	-0.0020	+/-0.030	
Decachlorobiphenyl	100.0	88.6	80 - 120	7.295	7.299	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	100.0	89.2	80 - 120	8.105	8.109	-0.0040	+/-0.030	

J/UJ

063

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1407217
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H21905	Instrument:	GL-ECD3
		Calibration:	4209006

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
VWW06-SD051-2430 (1407217-15) ug/Kg dry				Lab File ID: 026F2601.D		Analyzed: 08/06/14 18:36		
Tetrachloro-m-xylene	27.04	66.2	70 - 125	2.49	2.496	-0.0060	+/-0.030	*
Tetrachloro-m-xylene [2C]	27.04	67.0	70 - 125	2.96	2.963	-0.0030	+/-0.030	*
Decachlorobiphenyl	27.04	64.4	60 - 125	7.293	7.301	-0.0080	+/-0.030	
Decachlorobiphenyl [2C]	27.04	65.1	60 - 125	8.105	8.108	-0.0030	+/-0.030	
VWW06-SD051-4854 (1407217-16) ug/Kg dry				Lab File ID: 027F2701.D		Analyzed: 08/06/14 18:49		
Tetrachloro-m-xylene	27.34	82.6	70 - 125	2.49	2.496	-0.0060	+/-0.030	
Tetrachloro-m-xylene [2C]	27.34	82.9	70 - 125	2.96	2.963	-0.0030	+/-0.030	
Decachlorobiphenyl	27.34	81.7	60 - 125	7.292	7.301	-0.0090	+/-0.030	
Decachlorobiphenyl [2C]	27.34	81.2	60 - 125	8.104	8.108	-0.0040	+/-0.030	
VWW06-SD051-7278 (1407217-17) ug/Kg dry				Lab File ID: 028F2801.D		Analyzed: 08/06/14 19:02		
Tetrachloro-m-xylene	25.33	65.1	70 - 125	2.49	2.496	-0.0060	+/-0.030	*
Tetrachloro-m-xylene [2C]	25.33	66.2	70 - 125	2.961	2.963	-0.0020	+/-0.030	*
Decachlorobiphenyl	25.33	66.3	60 - 125	7.293	7.301	-0.0080	+/-0.030	
Decachlorobiphenyl [2C]	25.33	66.2	60 - 125	8.105	8.108	-0.0030	+/-0.030	
Calibration Check (4H21905-CCV7) ug/L				Lab File ID: 032F3201.D		Analyzed: 08/06/14 19:53		
Tetrachloro-m-xylene	100.0	104	80 - 120	2.491	2.496	-0.0050	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	102	80 - 120	2.961	2.963	-0.0020	+/-0.030	
Decachlorobiphenyl	100.0	96.6	80 - 120	7.292	7.301	-0.0090	+/-0.030	
Decachlorobiphenyl [2C]	100.0	95.6	80 - 120	8.104	8.108	-0.0040	+/-0.030	

JTWS

JTWS

064

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

VWW06-SD054-0006

Lab Name: Empirical Laboratories, LLC

Lab Sample ID: 1407217-01 Date(s) Analyzed: 08/08/2014 08/08/2014

Instrument ID (1): GL-ECD3 Instrument ID (2): GL-ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	4.58	4.84	4.90	77.7	
	2	5.81	6.14	6.20	127	48 J

065

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

VWW06-SD053-0006

Lab Name: Empirical Laboratories, LLC

Lab Sample ID: 1407217-06 Date(s) Analyzed: 08/08/2014 08/08/2014

Instrument ID (1): GL-ECD3 Instrument ID (2): GL-ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	4.58	4.84	4.90	202	
	2	5.35	6.14	6.20	286	34
Aroclor-1260	1	6.67	6.95	7.01	48.7	
	2	6.52	6.83	6.89	101	70

066

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

VWW06-SD052-0006

Lab Name: Empirical Laboratories, LLC

Lab Sample ID: 1407217-10 Date(s) Analyzed: 08/08/2014 08/08/2014

Instrument ID (1): GL-ECD3 Instrument ID (2): GL-ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	4.58	4.84	4.90	17.0	
	2	5.35	6.14	6.20	32.5	63

J

067

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

VWW06-SD051-0006

Lab Name: Emptrical Laboratories, LLC

Lab Sample ID: 1407217-14 Date(s) Analyzed: 08/08/2014 08/08/2014

Instrument ID (1): GL-ECD3 Instrument ID (2): GL-ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	4.58	4.84	4.90	16.3	
	2	5.81	6.14	6.20	34.5	72

DataQual *Select Metals by ICP-AES*

This SDG contains 17 solid matrix samples and 1QC blank samples analyzed for select metals using SW-846 methods 6010C. Region II validation guidelines were applied (updated 12/20/12) and these worksheets are submitted along with marked up pages from the data package and annotated form 1s and EDD files.

HOLDING TIMES

Sampling Date: 7/28, 7/29
Received Date: 7/30/14
Prep. Dates: 8/11 EB; 7/30, reprep on 8/12
Analysis Dates: 7/31, 8/18, 8/19

All preparation & analysis holding time requirements were met. Cooler temps were acceptable and receipt paperwork was in order. All samples exhibited %solids values >50% with one exception. Results in sample VWW06-SD054-5460 were qualified as estimated J/UJ due to solids of 44.34%.

CALIBRATIONS

All initial calibration criteria were met for the methods noted above. All ICV, CCV and low calibration standard criteria were met or associated samples were reanalyzed against acceptable QC standards. PQL standard criteria were met. ICSA/ICSAB results were within method criteria for all analytes. Raw data was verified.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- See blank type specific validation guidelines noted below (taken from the Region II SOP for CLP metals and adapted to this project).
- Qualification/Action codes:

Note: non-detect results are reported to the LOD so the LOD is the RL for this project.

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the reporting limit, when the ICB/CCB/PB result is less than the RL.
R -	Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
J/UJ -	Sample result is less than 10X RL when blank result is below the negative RL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.
Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL when the field blank result is greater than the RL - result is reported as non-detect at the reporting limit.
R -	Sample result is greater than the RL and less than the field blank value when the field blank result is greater than the RL.
J -	Sample result is greater than the field blank value but less than 10X the field blank value when field blank result is greater than the RL.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	Action Level	Q Flag
no contamination was noted in the associated blanks				

See validation report for specific samples and qualifications. Only those analytes requiring action are listed here. Negative contamination in a prep blank or CCB, if less than the analyte CRDL, is qualified based on professional judgment. Field QC blank associations are determined using tracking provided by the client. Flags are applied to samples based on these associations. The concentration noted for the CCBs is the highest concentration in all the associated CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all

analytes in all samples are flagged for CCB contamination

MATRIX SPIKE/DUPLICATE SUMMARY

Qualifications were made based on the 12/12 revision of the Region II guidance SOPs which flags only the native sample for spike and spike dup recovery and RPD issues. The submitted PDS spikes were also considered in the evaluation of the spike data.

The MS/MSD pair of sample VWW06-SD054-0006 exhibited acceptable recoveries in the MSD but recoveries were high in the MS. The submitted PDS was acceptable. The reported positive results in the native sample were qualified as estimated J+ for both analytes. All associated LCS recoveries were acceptable also.

SERIAL DILUTIONS

The laboratory submitted acceptable serial dilution analyses. No qualifications were required.

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments. Dilutions were performed. The raw data and calculations were verified. Field duplicates were assessed – see the following page for results and qualifications if needed.

Reviewer _____ Date: 10 25 14

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD054-7278
Duplicate Sample ID: VWW06-SD054P-7278

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	1.44	1.27	13
zinc	8.9	11.3	24

COMMENTS: No qualifications were required.
*30% RPD limit for all analytes >5X LOD - results in both samples flagged J

CH2M HILL VIEQUES CTO-113

SDG 1407217

METALS CALCULATIONS

ICP - AES	
SAMPLE ID	VWW06-SD054-0006
ANALYTE	zinc
Lab Value CONCENTRATION (ug/Kg)	247
AMOUNT FROM RAW DATA (ug/L)	683.37
SAMPLE SIZE (g)	1.05
FINAL VOLUME (L)	0.2
DILUTION FACTOR	1
DRYNESS FACTOR	0.5273
CONVERSION FACTOR (g TO Kg)	1
CALCULATED CONCENTRATION (ug/Kg)	246.85

CH2MHILL VIEQUES SWMU6 CTO-113

SDG 1407217

Reporting Limit Calcs

ICP - AES	
SAMPLE ID	VWW06-SD053-2430
ANALYTE	lead
Form 1 LOD or LOQ Value (mg/Kg)	0.995
Analyte LOD or LOQ	0.6
SAMPLE SIZE (g)	1
DILUTION FACTOR	1
DRYNESS FACTOR	0.603
Corrected LOD or LOQ (mg/Kg)	0.995

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW6010C

VWW06-SD054-0006

Laboratory:	Empirical Laboratories, LLC	SDG:	1407217
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid		
Batch:	4G30021		
% Solids:	52.73		

Source Sample Name: 1407217-01

ANALYTE	SPIKE ADDED (mg/Kg dry)	SAMPLE CONCENTRATION (mg/Kg dry)	MS CONCENTRATION (mg/Kg dry)	MS % REC.	Q	QC LIMITS REC
Lead	90.30	142.2	252.6	122	N	80 - 120
Zinc	180.6	246.8	483.2	131	N	80 - 120

ANALYTE	SPIKE ADDED (mg/Kg dry)	MSD CONCENTRATION (mg/Kg dry)	MSD % REC #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Lead	91.17	219.7	85.0	13.9		20	80 - 120
Zinc	182.3	420.2	95.1	14.0		20	80 - 120

flag in native sample only
PDS OK

POST DIGEST SPIKE SAMPLE RECOVERY

SW6010C

VWW06-SD054-0006

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

Batch: 4G30021

Preparation: MET_3050B

SDG: 1407217

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4G30021-PS1

Lab Source ID: 1407217-01

Initial/Final: 1.05 g / 200 mL

Analyte	Spike Sample Result (SSR) (ug/L)	Sample Result (SR) (ug/L)	Spike Added (SA) (ug/L)	%R	Control Limit %R
Lead	641.8	393.7	250.0	99.2	80 - 120
Zinc	1216	683.4	500.0	107	80 - 120

DataQual
Environmental Services, LLC

CH2M HILL-VBO
5701 Cleveland Street
Suite 200
Virginia Beach, VA 23462

October 28, 2014
SDG# 1407232; Empirical Laboratories, LLC
Vieques CTO-113, SWMU6 – Naval Training Range

Dear Ms. Dean,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1407232. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, professional judgment, and the guidance offered in the region II SOPs HW-2a Revision 15, December 2012, for ICP-AES data validation and HW-37 Revision 3, May 2013, for PCB data validation. The DoD Quality Systems Manual for Environmental Laboratories Version 4.2 and the project specific SAP were also consulted. Worksheets tabulating the validation process including calculation verifications are included in the support documentation section of this report. All areas of concern are discussed in the body of the report and a summary of data qualifications are provided.

Sample ID	Lab ID	Matrix	PCB	Pb, Zn
VWW06-SD046-0006	1407232-01	soil	X	X
VWW06-SD046-2430	1407232-02	soil	X	X
VWW06-SD046-2430MS	1407232-02MS	soil	X	
VWW06-SD046-2430MSD	1407232-02MSD	soil	X	
VWW06-SD046-4854	1407232-03	soil	X	X
VWW06-SD046P-4854	1407232-04	soil	X	X
VWW06-SD046-7278	1407232-05	soil	X	X
VWW06-SD047-0006	1407232-06	soil	X	X
VWW06-SD047-2430	1407232-07	soil	X	X
VWW06-SD047-4854	1407232-08	soil	X	X
VWW06-SD047-7278	1407232-09	soil	X	X
VWW06-SD048-0006	1407232-10	soil	X	X
VWW06-SD048-2430	1407232-11	soil	X	X
VWW06-SD048-4854	1407232-12	soil	X	X
VWW06-SD048P-4854	1407232-13	soil	X	X
VWW06-SD048-7278	1407232-14	soil	X	X
VWW06-SD049-0006	1407232-15	soil	X	X
VWW06-SD049-2636	1407232-16	soil	X	X
VWW06-SD049-4854	1407232-17	soil	X	X
VWW06-SD049-7278	1407232-18	soil	X	X
VWW06-SD050-0006	1407232-19	soil	X	X
VWW06-SD050P-0006	1407232-20	soil	X	X
VWW06-SD050-2430	1407232-21	soil	X	X
VWW06-SD050-4854	1407232-22	soil	X	X
VWW06-SD050-7278	1407232-23	soil	X	X
VWW06-EB01-073014	1407232-24	water	X	X

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The following quality control samples were provided with this SDG: sample VWW06-SD046P-4854-field duplicate of sample VWW06-SD046-4854; sample VWW06-SD048P-4854-field duplicate of sample VWW06-SD048-4854; sample VWW06-SD050P-0006-field duplicate of sample VWW06-SD050-0006; and rinse blank sample VWW06-EB01-073014.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition
- Technical Holding Times *
- Initial/Continuing Calibrations *
- ICSA/ICSAB Standards *
- Low Level Standards *
- Blanks *
- Surrogate Recoveries *
- Laboratory Control Samples *
- Matrix Spike Recoveries *
- Matrix Duplicate RPDs *
- Serial Dilutions *
- Field Duplicates
- Identification/Quantitation
- Reporting Limits *

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there -were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. *If an issue is not addressed in this narrative there were no actions required based on unmet quality control criteria.*

No critical findings resulting in data rejections were noted. Some major findings resulting in qualification of data as estimated were noted. The majority of the data is reported without qualification.

PCBs

Five reported positive results exhibited column quantitation %Ds greater than the 40% RPD criteria from the project specific SAP and qualifications were required.

Select Metals Pb & Zn

Three samples exhibited high moisture content (>50%). Qualifications were required based on Region II validation guidelines.

One of the field duplicate pairs exhibited a result with a high RPD (>30% for results >5XLOD) and required qualification.

Specific Evaluation of Data

Data Completeness

The SDG was received complete and intact. Updated MS/MSD results forms that included the client sample ID were requested and received from the laboratory.

Technical Holding Times

According to chain of custody records, sampling was performed on 7/29/14 and samples were received at the laboratory 7/31/14. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

Sample Condition

Select Metals, Pb & Zn

Three samples exhibited low solids content (<50%) as noted in the following table. All reported results were qualified as estimated J/UJ based on the Region II guidance.

Sample ID	%Solids	Q Flag	Q Code
VWW06-SD048-0006	49.18	J/UJ	OT
VWW06-SD049-2636	48.12		
VWW06-SD050-0006	37.91		

Compound Identification/Quantitation

PCBs

Five positive results exhibited column quantitation %D >40% (based on the SAP requirement). Results were flagged as noted in the following table. The total PCBs results were also flagged as estimated based on the column quantitation %D non-

compliance. One result was flagged as M, due to matrix interferences. This result was also flagged due to column quantitation %D non-compliance.

Sample ID	%D	Q Flag	Q Code
VWW06-SD046-0006	64	J	2C
VWW06-SD048-0006	84		
VWW06-SD050-0006	62		
VWW06-SD050P-0006	56		
VWW06-SD049-0006	108	NJ	2C

Please note that the reporting limits for four analytes in one sample, VWW06-SD050P-0006, were raised due to matrix interferences. This is a valid action but does not require a validation qualifier. Therefore the C9 lab qualifier is removed from the sample results.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Jacqueline Cleveland

Jacqueline Cleveland
Vice President

Summary of Data Qualifications

PCBs

Sample ID	Compounds	Results	Q Flag	Q Code
VWW06-SD046-0006, VWW06-SD048-0006, VWW06-SD050-0006, VWW06-SD050P-0006	AR1254 total Aroclors	+P	J	2C
VWW06-SD049-0006	AR1254 total Aroclors	+P	NJ	2C

Select Metals – Pb & Zn

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-SD048-0006, VWW06-SD049-2636, VWW06-SD050-0006	lead zinc	+	J/UJ	OT
VWW06-SD050-0006, VWW06-SD050P-0006	lead	+	J	FD

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
J+	estimated biased high
J-	estimated biased low
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the LOD (2X sample LOD for common laboratory contaminants) when the blank value is less than the LOD. The sample result for the blank contaminant is not qualified with any blank qualifiers.
LOD	The sample result for the blank contaminant is less than the LOD (2X sample LOD for common laboratory contaminants) but greater than the MDL when the blank value is less than the LOD. The sample result for the blank contaminant is changed to the LOD and qualified as non-detect U.

Inorganic Methods

ICB/CCB/PB Action:

No Action –	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the ICB/CCB/PB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the LOD.
J+ -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the LOD.
J/UJ -	Sample result is less than 10X LOD when blank result is below the negative LOD.

Glossary of Qualification Flags and Abbreviations, continued

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.
Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD when the FB result is less or greater than the LOD.
R –	Sample result is greater than the LOD and less than the FB value when the FB value is greater than the LOD.
J+ -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the LOD.

General Abbreviations

MDL	method detection limit
IDL	instrument detection limit
LOD/RL	Level of Detection//Reporting Limit
LOQ	Level of Quantitation
+	positive result
-	non-detect result

ANALYSIS DATA SHEET

VWW06-SD046-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-01	File ID:	076F7601.D
Sampled:	07/29/14 08:30	Prepared:	08/05/14 11:46	Analyzed:	08/08/14 09:28
Solids:	50.90	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence: 4H22505	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	45.6	15.4	20.6	61.7	J, X, 2C
12674-11-2	Aroclor-1016		7.73	15.4	30.9	U
11104-28-2	Aroclor-1221		7.73	15.4	30.9	U
11141-16-5	Aroclor-1232		7.73	15.4	30.9	U
53469-21-9	Aroclor-1242 [2C]		7.73	15.4	30.9	U
12672-29-6	Aroclor-1248		7.73	15.4	30.9	U
11097-69-1	Aroclor-1254 [2C]	45.6	7.73	15.4	30.9	J, X, 2C
11096-82-5	Aroclor-1260		7.73	15.4	30.9	U
37324-23-5	Aroclor-1262		7.73	15.4	30.9	U
11100-14-4	Aroclor-1268		7.73	15.4	30.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.89	25.20	81.6	70 - 125	
Tetrachloro-m-xylene [2C]	30.89	25.51	82.6	70 - 125	
Decachlorobiphenyl	30.89	25.39	82.2	60 - 125	
Decachlorobiphenyl [2C]	30.89	26.92	87.2	60 - 125	

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ANALYSIS DATA SHEET

VWW06-SD046-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-02	File ID:	040F4001.D
Sampled:	07/29/14 08:35	Prepared:	08/05/14 11:46	Analyzed:	08/06/14 21:37
Solids:	59.36	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.5	18.0	54.1	U
12674-11-2	Aroclor-1016		6.78	13.5	27.1	U
11104-28-2	Aroclor-1221		6.78	13.5	27.1	U
11141-16-5	Aroclor-1232		6.78	13.5	27.1	U
53469-21-9	Aroclor-1242		6.78	13.5	27.1	U
12672-29-6	Aroclor-1248		6.78	13.5	27.1	U
11097-69-1	Aroclor-1254		6.78	13.5	27.1	U
11096-82-5	Aroclor-1260		6.78	13.5	27.1	U
37324-23-5	Aroclor-1262		6.78	13.5	27.1	U
11100-14-4	Aroclor-1268		6.78	13.5	27.1	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.08	22.75	84.0	70 - 125	
Tetrachloro-m-xylene [2C]	27.08	22.61	83.5	70 - 125	
Decachlorobiphenyl	27.08	23.09	85.3	60 - 125	
Decachlorobiphenyl [2C]	27.08	23.11	85.3	60 - 125	

JAC 10/28/14

009

ANALYSIS DATA SHEET

VWW06-SD046-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-03	File ID:	043F4301.D
Sampled:	07/29/14 08:40	Prepared:	08/05/14 11:46	Analyzed:	08/06/14 22:16
Solids:	61.15	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence: 4H21905	Calibration:	4209006	Instrument: OL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.1	17.4	52.3	U
12674-11-2	Aroclor-1016		6.55	13.1	26.2	U
11104-28-2	Aroclor-1221		6.55	13.1	26.2	U
11141-16-5	Aroclor-1232		6.55	13.1	26.2	U
53469-21-9	Aroclor-1242		6.55	13.1	26.2	U
12672-29-6	Aroclor-1248		6.55	13.1	26.2	U
11097-69-1	Aroclor-1254		6.55	13.1	26.2	U
11096-82-5	Aroclor-1260		6.55	13.1	26.2	U
37324-23-5	Aroclor-1262		6.55	13.1	26.2	U
11100-14-4	Aroclor-1268		6.55	13.1	26.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.17	22.33	85.3	70 - 125	
Tetrachloro-m-xylene [2C]	26.17	22.48	85.9	70 - 125	
Decachlorobiphenyl	26.17	23.86	91.2	60 - 125	
Decachlorobiphenyl [2C]	26.17	23.96	91.6	60 - 125	

AC 10/20/14

010

ANALYSIS DATA SHEET

VWW06-SD046P-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-04	File ID:	044F4401.D
Sampled:	07/29/14 08:45	Prepared:	08/05/14 11:46	Analyzed:	08/06/14 22:29
Solids:	62.19	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.0	17.3	52.0	U
12674-11-2	Aroclor-1016		6.51	13.0	26.1	U
11104-28-2	Aroclor-1221		6.51	13.0	26.1	U
11141-16-5	Aroclor-1232		6.51	13.0	26.1	U
53469-21-9	Aroclor-1242		6.51	13.0	26.1	U
12672-29-6	Aroclor-1248		6.51	13.0	26.1	U
11097-69-1	Aroclor-1254		6.51	13.0	26.1	U
11096-82-5	Aroclor-1260		6.51	13.0	26.1	U
37324-23-5	Aroclor-1262		6.51	13.0	26.1	U
11100-14-4	Aroclor-1268		6.51	13.0	26.1	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.04	20.24	77.7	70 - 125	
Tetrachloro-m-xylene [2C]	26.04	20.51	78.8	70 - 125	
Decachlorobiphenyl	26.04	19.86	76.3	60 - 125	
Decachlorobiphenyl [2C]	26.04	20.07	77.1	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD046-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-05	File ID:	045F4501.D
Sampled:	07/29/14 08:50	Prepared:	08/05/14 11:46	Analyzed:	08/06/14 22:42
Solids:	58.37	Preparation:	EXT. 3546	Dilution:	1
Batch:	4H04017	Sequence: 4H21905	Calibration:	1209006	Instrument: GC-ECD3

CAS NO	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.5	18.0	54.1	U
12674-11-2	Aroclor-1016		6.78	13.5	27.1	U
11104-28-2	Aroclor-1221		6.78	13.5	27.1	U
11141-16-5	Aroclor-1232		6.78	13.5	27.1	U
53469-21-9	Aroclor-1242		6.78	13.5	27.1	U
12672-29-6	Aroclor-1248		6.78	13.5	27.1	U
11097-69-1	Aroclor-1254		6.78	13.5	27.1	U
11096-82-5	Aroclor-1260		6.78	13.5	27.1	U
37324-23-5	Aroclor-1262		6.78	13.5	27.1	U
11100-14-4	Aroclor-1268		6.78	13.5	27.1	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.09	23.91	88.3	70 - 125	
Tetrachloro-m-xylene [2C]	27.09	24.34	89.8	70 - 125	
Decachlorobiphenyl	27.09	24.05	88.8	60 - 125	
Decachlorobiphenyl [2C]	27.09	24.31	89.8	60 - 125	

JAC 10-24-14

012

ANALYSIS DATA SHEET

VWW06-SD047-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-06	File ID:	077F770I.D
Sampled:	07/29/14 09:30	Prepared:	08/05/14 11:46	Analyzed:	08/08/14 09:41
Solids:	55.75	Preparation:	EXT. 3546	Dilution:	1
Batch:	4H04017	Sequence:	4H22505	Calibration:	4209006
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	29.3	14.4	19.2	57.6	J
12674-11-2	Aroclor-1016		7.21	14.4	28.9	U
11104-28-2	Aroclor-1221		7.21	14.4	28.9	U
11141-16-5	Aroclor-1232		7.21	14.4	28.9	U
53469-21-9	Aroclor-1242 [2C]		7.21	14.4	28.9	U
12672-29-6	Aroclor-1248		7.21	14.4	28.9	U
11097-69-1	Aroclor-1254 [2C]	29.3	7.21	14.4	28.9	
11096-82-5	Aroclor-1260		7.21	14.4	28.9	U
37324-23-5	Aroclor-1262		7.21	14.4	28.9	U
11100-14-4	Aroclor-1268		7.21	14.4	28.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	28.82	25.54	88.6	70 - 125	
Tetrachloro-m-xylene [2C]	28.82	25.52	88.6	70 - 125	
Decachlorobiphenyl	28.82	26.52	92.0	60 - 125	
Decachlorobiphenyl [2C]	28.82	27.80	96.4	60 - 125	

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ANALYSIS DATA SHEET

VWW06-SD047-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-07	File ID:	047F4701.D
Sampled:	07/29/14 09:35	Prepared:	08/05/14 11:46	Analyzed:	08/06/14 23:07
Solids:	61.05	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.4	17.9	53.6	U
12674-11-2	Aroclor-1016		6.71	13.4	26.9	U
11104-28-2	Aroclor-1221		6.71	13.4	26.9	U
11141-16-5	Aroclor-1232		6.71	13.4	26.9	U
53469-21-9	Aroclor-1242		6.71	13.4	26.9	U
12672-29-6	Aroclor-1248		6.71	13.4	26.9	U
11097-69-1	Aroclor-1254		6.71	13.4	26.9	U
11096-82-5	Aroclor-1260		6.71	13.4	26.9	U
37324-23-5	Aroclor-1262		6.71	13.4	26.9	U
11100-14-4	Aroclor-1268		6.71	13.4	26.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.83	23.07	86.0	70 - 125	
Tetrachloro-m-xylene [2C]	26.83	23.09	86.1	70 - 125	
Decachlorobiphenyl	26.83	23.75	88.5	60 - 125	
Decachlorobiphenyl [2C]	26.83	23.94	89.2	60 - 125	

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014

ANALYSIS DATA SHEET

VWW06-SD047-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-08	File ID:	048F4801.D
Sampled:	07/29/14 09:40	Prepared:	08/05/14 11:46	Analyzed:	08/06/14 23:20
Solids:	57.17	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence:	4H21905	Calibration:	4209006
Instrument:	GC-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.2	18.9	56.7	U
12674-11-2	Aroclor-1016		7.10	14.2	28.4	U
11104-28-2	Aroclor-1221		7.10	14.2	28.4	U
11141-16-5	Aroclor-1232		7.10	14.2	28.4	U
53469-21-9	Aroclor-1242		7.10	14.2	28.4	U
12672-29-6	Aroclor-1248		7.10	14.2	28.4	U
11097-69-1	Aroclor-1254		7.10	14.2	28.4	U
11096-82-5	Aroclor-1260		7.10	14.2	28.4	U
37324-23-5	Aroclor-1262		7.10	14.2	28.4	U
11100-14-4	Aroclor-1268		7.10	14.2	28.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	28.36	27.22	96.0	70 - 125	
Tetrachloro-m-xylene [2C]	28.36	28.50	100	70 - 125	
Decachlorobiphenyl	28.36	27.66	97.5	60 - 125	
Decachlorobiphenyl [2C]	28.36	27.63	97.4	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD047-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-09	File ID:	052F5201.D
Sampled:	07/29/14 09:45	Prepared:	08/05/14 11:46	Analyzed:	08/07/14 00:12
Solids:	59.63	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence:	4H21905	Calibration:	4209006
Instrument:	GL-ECD3				

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.6	18.2	54.5	U
12674-11-2	Aroclor-1016		6.83	13.6	27.3	U
11104-28-2	Aroclor-1221		6.83	13.6	27.3	U
11141-16-5	Aroclor-1232		6.83	13.6	27.3	U
53469-21-9	Aroclor-1242		6.83	13.6	27.3	U
12672-29-6	Aroclor-1248		6.83	13.6	27.3	U
11097-69-1	Aroclor-1254		6.83	13.6	27.3	U
11096-82-5	Aroclor-1260		6.83	13.6	27.3	U
37324-23-5	Aroclor-1262		6.83	13.6	27.3	U
11100-14-4	Aroclor-1268		6.83	13.6	27.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.28	22.12	81.1	70 - 125	
Tetrachloro-m-xylene [2C]	27.28	22.61	82.9	70 - 125	
Decachlorobiphenyl	27.28	21.69	79.5	60 - 125	
Decachlorobiphenyl [2C]	27.28	21.92	80.3	60 - 125	

JBC 10/20/14

ANALYSIS DATA SHEET

VWW06-SD048-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-10	File ID:	078F7801.D
Sampled:	07/29/14 10:25	Prepared:	08/05/14 11:46	Analyzed:	08/08/14 09:54
Solids:	49.18	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence: 4H22505	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	114	16.6	22.2	66.5	J 2C
12674-11-2	Aroclor-1016 [2C]		8.33	16.6	33.4	U
11104-28-2	Aroclor-1221		8.33	16.6	33.4	U
11141-16-5	Aroclor-1232		8.33	16.6	33.4	U
53469-21-9	Aroclor-1242 [2C]		8.33	16.6	33.4	U
12672-29-6	Aroclor-1248		8.33	16.6	33.4	U
11097-69-1	Aroclor-1254 [2C]	114	8.33	16.6	33.4	J P 2C
11096-82-5	Aroclor-1260		8.33	16.6	33.4	U
37324-23-5	Aroclor-1262		8.33	16.6	33.4	U
11100-14-4	Aroclor-1268		8.33	16.6	33.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	33.29	29.34	88.1	70 - 125	
Tetrachloro-m-xylene [2C]	33.29	28.95	87.0	70 - 125	
Decachlorobiphenyl	33.29	29.99	90.1	60 - 125	
Decachlorobiphenyl [2C]	33.29	31.57	94.8	60 - 125	

JKC 10-2014

617

ANALYSIS DATA SHEET

VWW06-SD048-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-11	File ID:	054F5401.D
Sampled:	07/29/14 10:30	Prepared:	08/05/14 11:46	Analyzed:	08/07/14 00:38
Solids:	55.97	Preparation:	EXT_3546	Dilution:	1

Batch: 4H04017 Sequence: 4H21905 Calibration: 4209006 Instrument: GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.7	19.6	58.8	U
12674-11-2	Aroclor-1016		7.36	14.7	29.5	U
11104-28-2	Aroclor-1221		7.36	14.7	29.5	U
11141-16-5	Aroclor-1232		7.36	14.7	29.5	U
53469-21-9	Aroclor-1242		7.36	14.7	29.5	U
12672-29-6	Aroclor-1248		7.36	14.7	29.5	U
11097-69-1	Aroclor-1254		7.36	14.7	29.5	U
11096-82-5	Aroclor-1260		7.36	14.7	29.5	U
37324-23-5	Aroclor-1262		7.36	14.7	29.5	U
11100-14-4	Aroclor-1268		7.36	14.7	29.5	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.42	26.65	90.6	70 - 125	
Tetrachloro-m-xylene [2C]	29.42	27.03	91.9	70 - 125	
Decachlorobiphenyl	29.42	27.31	92.8	60 - 125	
Decachlorobiphenyl [2C]	29.42	26.77	91.0	60 - 125	

JAC 10/20/14

018

ANALYSIS DATA SHEET

VWW06-SD048-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-12	File ID:	055F5501.D
Sampled:	07/29/14 10:35	Prepared:	08/05/14 11:46	Analyzed:	08/07/14 00:51
Solids:	59.13	Preparation:	EXT_3546	Dilution:	1

Batch: 4H04017 Sequence: 4H21905 Calibration: 4209006 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.7	18.3	54.9	U
12674-11-2	Aroclor-1016		6.87	13.7	27.5	U
11104-28-2	Aroclor-1221		6.87	13.7	27.5	U
11141-16-5	Aroclor-1232		6.87	13.7	27.5	U
53469-21-9	Aroclor-1242		6.87	13.7	27.5	U
12672-29-6	Aroclor-1248		6.87	13.7	27.5	U
11097-69-1	Aroclor-1254		6.87	13.7	27.5	U
11096-82-5	Aroclor-1260		6.87	13.7	27.5	U
37324-23-5	Aroclor-1262		6.87	13.7	27.5	U
11100-14-4	Aroclor-1268		6.87	13.7	27.5	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.47	22.79	82.9	70 - 125	
Tetrachloro-m-xylene [2C]	27.47	23.06	83.9	70 - 125	
Decachlorobiphenyl	27.47	22.25	81.0	60 - 125	
Decachlorobiphenyl [2C]	27.47	22.20	80.8	60 - 125	

JLC 16 2014

019

ANALYSIS DATA SHEET

VWW06-SD048P-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-13	File ID:	056F5601.D
Sampled:	07/29/14 10:40	Prepared:	08/05/14 11:46	Analyzed:	08/07/14 01:04
Solids:	58.61	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.4	17.8	53.5	U
12674-11-2	Aroclor-1016		6.70	13.4	26.8	U
11104-28-2	Aroclor-1221		6.70	13.4	26.8	U
11141-16-5	Aroclor-1232		6.70	13.4	26.8	U
53469-21-9	Aroclor-1242		6.70	13.4	26.8	U
12672-29-6	Aroclor-1248		6.70	13.4	26.8	U
11097-69-1	Aroclor-1254		6.70	13.4	26.8	U
11096-82-5	Aroclor-1260		6.70	13.4	26.8	U
37324-23-5	Aroclor-1262		6.70	13.4	26.8	U
11100-14-4	Aroclor-1268		6.70	13.4	26.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.76	22.68	84.7	70 - 125	
Tetrachloro-m-xylene [2C]	26.76	22.91	85.6	70 - 125	
Decachlorobiphenyl	26.76	22.73	84.9	60 - 125	
Decachlorobiphenyl [2C]	26.76	22.72	84.9	60 - 125	

JLC 10-20-14

020

ANALYSIS DATA SHEET

VWW06-SD048-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-14	File ID:	057F5701.D
Sampled:	07/29/14 10:45	Prepared:	08/05/14 11:46	Analyzed:	08/07/14 01:17
Solids:	56.58	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	QL	LOD	LOQ	Q
NA	Total PCBs		14.4	19.2	57.7	U
12674-11-2	Aroclor-1016		7.23	14.4	29.0	U
11104-28-2	Aroclor-1221		7.23	14.4	29.0	U
11141-16-5	Aroclor-1232		7.23	14.4	29.0	U
53469-21-9	Aroclor-1242		7.23	14.4	29.0	U
12672-29-6	Aroclor-1248		7.23	14.4	29.0	U
11097-69-1	Aroclor-1254		7.23	14.4	29.0	U
11096-82-5	Aroclor-1260		7.23	14.4	29.0	U
37324-23-5	Aroclor-1262		7.23	14.4	29.0	U
11100-14-4	Aroclor-1268		7.23	14.4	29.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	28.90	19.78	68.4	70 - 125	*
Tetrachloro-m-xylene [2C]	28.90	20.30	70.3	70 - 125	
Decachlorobiphenyl	28.90	19.26	66.6	60 - 125	
Decachlorobiphenyl [2C]	28.90	19.29	66.7	60 - 125	

SAC 10-20-14

ANALYSIS DATA SHEET

VWW06-SD049-0006

Laboratory:	Empirical Laboratories, LLC		SDG	1407232	
Client:	CH2M Hill, Inc		Project	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-15	File ID:	079E7901.D
Sampled:	07/29/14 12:35	Prepared:	08/05/14 11:46	Analyzed:	08/08/14 10:07
Solids:	56.27	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence: 4H22505	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	16.1	14.7	19.6	58.7	NJ ~~J~~
12674-11-2	Aroclor-1016		7.35	14.7	29.4	U
11104-28-2	Aroclor-1221		7.35	14.7	29.4	U
11141-16-5	Aroclor-1232		7.35	14.7	29.4	U
53469-21-9	Aroclor-1242 [2C]		7.35	14.7	29.4	U
12672-29-6	Aroclor-1248		7.35	14.7	29.4	U
11097-69-1	Aroclor-1254	16.1	7.35	14.7	29.4	NJ ~~PMJ~~ JC
11096-82-5	Aroclor-1260		7.35	14.7	29.4	U
37324-23-5	Aroclor-1262		7.35	14.7	29.4	U
11100-14-4	Aroclor-1268		7.35	14.7	29.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.37	26.58	90.5	70 - 125	
Tetrachloro-m-xylene [2C]	29.37	26.16	89.1	70 - 125	
Decachlorobiphenyl	29.37	27.14	92.4	60 - 125	
Decachlorobiphenyl [2C]	29.37	28.50	97.1	60 - 125	

JC 8/28/14

022

ANALYSIS DATA SHEET

VWW06-SD049-2636

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-16	File ID:	059F5001.D
Sampled:	07/29/14 12:40	Prepared:	08/05/14 11:46	Analyzed:	08/07/14 01:43
Solids:	48.12	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence:	4HZ1905	Calibration:	4209006

Instrument: GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		17.2	23.0	68.9	U
12674-11-2	Aroclor-1016		8.63	17.2	34.6	U
11104-28-2	Aroclor-1221		8.63	17.2	34.6	U
11141-16-5	Aroclor-1232		8.63	17.2	34.6	U
53469-21-9	Aroclor-1242		8.63	17.2	34.6	U
12672-29-6	Aroclor-1248		8.63	17.2	34.6	U
11097-69-1	Aroclor-1254		8.63	17.2	34.6	U
11096-82-5	Aroclor-1260		8.63	17.2	34.6	U
37324-23-5	Aroclor-1262		8.63	17.2	34.6	U
11100-14-4	Aroclor-1268		8.63	17.2	34.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	34.50	29.00	84.1	70 - 125	
Tetrachloro-m-xylene [2C]	34.50	30.04	87.1	70 - 125	
Decachlorobiphenyl	34.50	26.52	76.9	60 - 125	
Decachlorobiphenyl [2C]	34.50	26.82	77.8	60 - 125	

SEC 10/30/14

ANALYSIS DATA SHEET

VWW06-SD049-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-17	File ID:	060F6001.D
Sampled:	07/29/14 12:45	Prepared:	08/05/14 11:46	Analyzed:	08/07/14 01:56
Solids:	59.07	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.6	18.1	54.2	U
12674-11-2	Aroclor-1016		6.79	13.6	27.2	U
11104-28-2	Aroclor-1221		6.79	13.6	27.2	U
11141-16-5	Aroclor-1232		6.79	13.6	27.2	U
53469-21-9	Aroclor-1242		6.79	13.6	27.2	U
12672-29-6	Aroclor-1248		6.79	13.6	27.2	U
11097-69-1	Aroclor-1254		6.79	13.6	27.2	U
11096-82-5	Aroclor-1260		6.79	13.6	27.2	U
37324-23-5	Aroclor-1262		6.79	13.6	27.2	U
11100-14-4	Aroclor-1268		6.79	13.6	27.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.13	24.07	88.7	70 - 125	
Tetrachloro-m-xylene [2C]	27.13	24.39	89.9	70 - 125	
Decachlorobiphenyl	27.13	24.10	88.8	60 - 125	
Decachlorobiphenyl [2C]	27.13	24.07	88.7	60 - 125	

JBC 10/28/14

024

ANALYSIS DATA SHEET

VWW06-SD049-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-18	File ID:	061F6101.D
Sampled:	07/29/14 12:50	Prepared:	08/05/14 11:46	Analyzed:	08/07/14 02:09
Solids:	53.20	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence: 4H21905	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.0	20.0	60.1	U
12674-11-2	Aroclor-1016		7.53	15.0	30.1	U
11104-28-2	Aroclor-1221		7.53	15.0	30.1	U
11141-16-5	Aroclor-1232		7.53	15.0	30.1	U
53469-21-9	Aroclor-1242		7.53	15.0	30.1	U
12672-29-6	Aroclor-1248		7.53	15.0	30.1	U
11097-69-1	Aroclor-1254		7.53	15.0	30.1	U
11096-82-5	Aroclor-1260		7.53	15.0	30.1	U
37324-23-5	Aroclor-1262		7.53	15.0	30.1	U
11100-14-4	Aroclor-1268		7.53	15.0	30.1	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.08	23.80	79.1	70 - 125	
Tetrachloro-m-xylene [2C]	30.08	24.17	80.4	70 - 125	
Decachlorobiphenyl	30.08	24.23	80.5	60 - 125	
Decachlorobiphenyl [2C]	30.08	24.34	80.9	60 - 125	

JBC 10/20/14

025

ANALYSIS DATA SHEET

VWW06-SD050-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-19	File ID:	080F8001.D
Sampled:	07/29/14 13:30	Prepared:	08/05/14 11:46	Analyzed:	08/08/14 10:20
Solids:	17.91	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence: 4H22505	Calibration:	4209006	Instrument: GL-ECD1

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	87.6	20.7	27.6	82.9	J 2C
12674-11-2	Aroclor-1016		10.4	20.7	41.6	U
11104-28-2	Aroclor-1221		10.4	20.7	41.6	U
11141-16-5	Aroclor-1232		10.4	20.7	41.6	U
53469-21-9	Aroclor-1242 [2C]		10.4	20.7	41.6	U
12672-29-6	Aroclor-1248		10.4	20.7	41.6	U
11097-69-1	Aroclor-1254 [2C]	87.6	10.4	20.7	41.6	J 2C
11096-82-5	Aroclor-1260		10.4	20.7	41.6	U
37324-23-5	Aroclor-1262		10.4	20.7	41.6	U
11100-14-4	Aroclor-1268		10.4	20.7	41.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	41.50	33.83	81.5	70 - 125	
Tetrachloro-m-xylene [2C]	41.50	32.90	79.3	70 - 125	
Decachlorobiphenyl	41.50	35.18	84.8	60 - 125	
Decachlorobiphenyl [2C]	41.50	37.23	89.7	60 - 125	

SAC 10/30/14

026

ANALYSIS DATA SHEET

VWW06-SD050P-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-20	File ID:	081F8101.D
Sampled:	07/29/14 13:35	Prepared:	08/05/14 11:46	Analyzed:	08/08/14 10:33
Solids:	51.19	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04017	Sequence: 4H22505	Calibration:	4209006	Instrument: DL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	75.9	15.7	20.9	62.8	J 2C
12674-11-2	Aroclor-1016 [2C]		18.8	18.8	31.5	C9U
11104-28-2	Aroclor-1221		7.86	15.7	31.5	U
11141-16-5	Aroclor-1232		18.8	18.8	31.5	C9U
53469-21-9	Aroclor-1242 [2C]		18.8	18.8	31.5	C9U
12672-29-6	Aroclor-1248		18.8	18.8	31.5	C9U
11097-69-1	Aroclor-1254 [2C]	75.9	7.86	15.7	31.5	J 2C
11096-82-5	Aroclor-1260		7.86	15.7	31.5	U
37324-23-5	Aroclor-1262		7.86	15.7	31.5	U
11100-14-4	Aroclor-1268		7.86	15.7	31.5	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.41	28.23	89.9	70 - 125	
Tetrachloro-m-xylene [2C]	31.41	27.83	88.6	70 - 125	
Decachlorobiphenyl	31.41	25.33	80.6	60 - 125	
Decachlorobiphenyl [2C]	31.41	27.20	86.6	60 - 125	

JBC 10/20/14

ANALYSIS DATA SHEET

VWW06-SD050-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-21	File ID:	058F5801.D
Sampled:	07/29/14 13:40	Prepared:	08/06/14 11:36	Analyzed:	08/11/14 23:33
Solids:	56.52	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H22502	Calibration:	4209006	Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.9	18.5	55.5	U
12674-11-2	Aroclor-1016		6.95	13.9	27.8	U
11104-28-2	Aroclor-1221		6.95	13.9	27.8	U
11141-16-5	Aroclor-1232		6.95	13.9	27.8	U
53469-21-9	Aroclor-1242		6.95	13.9	27.8	U
12672-29-6	Aroclor-1248		6.95	13.9	27.8	U
11097-69-1	Aroclor-1254		6.95	13.9	27.8	U
11096-82-5	Aroclor-1260		6.95	13.9	27.8	U
37324-23-5	Aroclor-1262		6.95	13.9	27.8	U
11100-14-4	Aroclor-1268		6.95	13.9	27.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.78	22.10	79.5	70 - 125	
Tetrachloro-m-xylene [2C]	27.78	23.20	83.5	70 - 125	
Decachlorobiphenyl	27.78	22.90	82.4	60 - 125	
Decachlorobiphenyl [2C]	27.78	23.26	83.7	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD050-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-22	File ID:	059F5901.D
Sampled:	07/29/14 13:45	Prepared:	08/06/14 11:36	Analyzed:	08/11/14 23:46
Solids:	63.61	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H22502	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		12.3	16.4	49.1	U
12674-11-2	Aroclor-1016		6.15	12.3	24.6	U
11104-28-2	Aroclor-1221		6.15	12.3	24.6	U
11141-16-5	Aroclor-1232		6.15	12.3	24.6	U
53469-21-9	Aroclor-1242		6.15	12.3	24.6	U
12672-29-6	Aroclor-1248		6.15	12.3	24.6	U
11097-69-1	Aroclor-1254		6.15	12.3	24.6	U
11096-82-5	Aroclor-1260		6.15	12.3	24.6	U
37324-23-5	Aroclor-1262		6.15	12.3	24.6	U
11100-14-4	Aroclor-1268		6.15	12.3	24.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	24.58	21.05	85.6	70 - 125	
Tetrachloro-m-xylene [2C]	24.58	22.60	91.9	70 - 125	
Decachlorobiphenyl	24.58	22.06	89.7	60 - 125	
Decachlorobiphenyl [2C]	24.58	23.75	96.6	60 - 125	

DMC 10/30/14

ANALYSIS DATA SHEET

VWW06-SD050-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1407232-23	File ID:	060F6001.D
Sampled:	07/29/14 13:50	Prepared:	08/06/14 11:36	Analyzed:	08/11/14 23:59
Solids:	53.75	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 41122502	Calibration:	4209006	Instrument: GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry	DL	LOD	LOQ	Q
NA	Total PCBs		14.9	19.9	59.6	U
12674-11-2	Aroclor-1016		7.46	14.9	29.9	U
11104-28-2	Aroclor-1221		7.46	14.9	29.9	U
11141-16-5	Aroclor-1232		7.46	14.9	29.9	U
53469-21-9	Aroclor-1242		7.46	14.9	29.9	U
12672-29-6	Aroclor-1248		7.46	14.9	29.9	U
11097-69-1	Aroclor-1254		7.46	14.9	29.9	U
11096-82-5	Aroclor-1260		7.46	14.9	29.9	U
37324-23-5	Aroclor-1262		7.46	14.9	29.9	U
11100-14-4	Aroclor-1268		7.46	14.9	29.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.82	23.63	79.2	70 - 125	
Tetrachloro-m-xylene [2C]	29.82	24.31	81.5	70 - 125	
Decachlorobiphenyl	29.82	25.23	84.6	60 - 125	
Decachlorobiphenyl [2C]	29.82	25.82	86.6	60 - 125	

SJC 10-20-14

U30

ANALYSIS DATA SHEET

VWW06-EB01-073014

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Water	Laboratory ID:	1407232-24	File ID:	032F3201.D
Sampled:	07/30/14 06:45	Prepared:	08/04/14 15:17	Analyzed:	08/04/14 23:59
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 4H04012 Sequence: 4H21803 Calibration: 4209006 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
NA	Total PCBs		0.120	0.250	0.500	U
12674-11-2	Aroclor-1016		0.120	0.250	0.500	U
11104-28-2	Aroclor-1221		0.120	0.250	0.500	U
11141-16-5	Aroclor-1232		0.120	0.250	0.500	U
53469-21-9	Aroclor-1242		0.120	0.250	0.500	U
12672-29-6	Aroclor-1248		0.120	0.250	0.500	U
11097-69-1	Aroclor-1254		0.120	0.250	0.500	U
11096-82-5	Aroclor-1260		0.120	0.250	0.500	U
37324-23-5	Aroclor-1262		0.120	0.250	0.500	U
11100-14-4	Aroclor-1268		0.120	0.250	0.500	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	0.5000	0.4719	94.4	25 - 140	
Tetrachloro-m-xylene [2C]	0.5000	0.4707	94.1	25 - 140	
Decachlorobiphenyl	0.5000	0.3371	67.4	40 - 135	
Decachlorobiphenyl [2C]	0.5000	0.3500	70.0	40 - 135	

ANALYSIS DATA SHEET

VWW06-SD046-2430 M5

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H04017-MS1	File ID:	041E4101.D
Sampled:		Prepared:		Analyzed:	08/06/14 21:50
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H04017 Sequence: 4H21905 Calibration: 4209006 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		6.97	13.9	27.9	U
11104-28-2	Aroclor-1221		6.97	13.9	27.9	U
11141-16-5	Aroclor-1232		6.97	13.9	27.9	U
53469-21-9	Aroclor-1242		6.97	13.9	27.9	U
12672-29-6	Aroclor-1248		6.97	13.9	27.9	U
11097-69-1	Aroclor-1254	429.3	6.97	13.9	27.9	
11096-82-5	Aroclor-1260		6.97	13.9	27.9	U
37324-23-5	Aroclor-1262		6.97	13.9	27.9	U
11100-14-4	Aroclor-1268		6.97	13.9	27.9	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	AMOUNT (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.86	25.38	91.1	70 - 125	
Decachlorobiphenyl	27.86	25.45	91.4	60 - 125	

JAC 120514

032

ANALYSIS DATA SHEET

VWW06-SD046-2430 MS

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	41104017-MS1	File ID:	041R4101.D
Sampled:		Prepared:		Analyzed:	08/06/14 21:50
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 41104017 Sequence: 41121905 Calibration: 4209006 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		6.97	13.9	27.9	U
11104-28-2	Aroclor-1221 [2C]		6.97	13.9	27.9	U
11141-16-5	Aroclor-1232 [2C]		6.97	13.9	27.9	U
53469-21-9	Aroclor-1242 [2C]		6.97	13.9	27.9	U
12672-29-6	Aroclor-1248 [2C]		6.97	13.9	27.9	U
11097-69-1	Aroclor-1254 [2C]	460.7	6.97	13.9	27.9	
11096-82-5	Aroclor-1260 [2C]		6.97	13.9	27.9	U
37324-23-5	Aroclor-1262 [2C]		6.97	13.9	27.9	U
11100-14-4	Aroclor-1268 [2C]		6.97	13.9	27.9	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	27.86	25.63	92.0	70 - 125	
Decachlorobiphenyl [2C]	27.86	25.59	91.9	60 - 125	

JC 102514

033

ANALYSIS DATA SHEET

VWW06-SD046-2430 MSD

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H04017-MSD1	File ID:	0421F4201.D
Sampled:		Prepared:		Analyzed:	08/06/14 22:03
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H04017 Sequence: 4H21905 Calibration: 4209006 Instrument: GL-ECD3

CAS NO.	COMPOUND	ONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		6.83	13.7	27.4	U
11104-28-2	Aroclor-1221		6.83	13.7	27.4	U
11141-16-5	Aroclor-1232		6.83	13.7	27.4	U
53469-21-9	Aroclor-1242		6.83	13.7	27.4	U
12672-29-6	Aroclor-1248		6.83	13.7	27.4	U
11097-69-1	Aroclor-1254	426.7	6.83	13.7	27.4	
11096-82-5	Aroclor-1260		6.83	13.7	27.4	U
37324-23-5	Aroclor-1262		6.83	13.7	27.4	U
11100-14-4	Aroclor-1268		6.83	13.7	27.4	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.31	23.44	85.8	70 - 125	
Decachlorobiphenyl	27.31	23.64	86.6	60 - 125	

GJC 102514

034

ANALYSIS DATA SHEET

VWW06-SD046-2430 MSD

Laboratory:	Empirical Laboratories, LLC		SDG:	1407232	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H04017-MSD1	File ID:	042R4201.D
Sampled:		Prepared:		Analyzed:	08/06/14 22:03
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H04017 Sequence: 4H21905 Calibration: 4209006 Instrument: GE-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		6.83	13.7	27.4	U
11104-28-2	Aroclor-1221 [2C]		6.83	13.7	27.4	U
11141-16-5	Aroclor-1232 [2C]		6.83	13.7	27.4	U
53469-21-9	Aroclor-1242 [2C]		6.83	13.7	27.4	U
12672-29-6	Aroclor-1248 [2C]		6.83	13.7	27.4	U
11097-69-1	Aroclor-1254 [2C]	445.2	6.83	13.7	27.4	
11096-82-5	Aroclor-1260 [2C]		6.83	13.7	27.4	U
37324-23-5	Aroclor-1262 [2C]		6.83	13.7	27.4	U
11100-14-4	Aroclor-1268 [2C]		6.83	13.7	27.4	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	27.31	23.59	86.4	70 - 125	
Decachlorobiphenyl [2C]	27.31	23.63	86.5	60 - 125	

JLC 10/25/14

035

ANALYSIS DATA SHEET

VWW06-SD046-0006

Laboratory:	Empirical Laboratories, LLC	SDG:	1407232
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1407232-01
Sampled:	07/29/14 08:30	Received:	07/31/14 08:50
% Solids:	50.90		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	145	0.584	1.17	1.95	1		SW6010C	4H11025	08/19/14 20:02
7440-66-6	Zinc	335	1.95	3.89	7.78	1		SW6010C	4H11025	08/19/14 20:02

036

ANALYSIS DATA SHEET

VWW06-SD046-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 08:35
% Solids: 59.36

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-02
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.16	0.491	0.981	1.64	1	J	SW6010C	4H11025	08/19/14 20:06
7440-66-6	Zinc	5.50	3.27	6.54	13.1	2	JB	SW6010C	4H11025	08/21/14 16:16

ANALYSIS DATA SHEET

VWW06-SD046-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 08:40
% Solids: 61.15

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-03
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	0.972	0.476	0.953	1.59	1	J	SW6010C	4H11025	08/19/14 20:11
7440-66-6	Zinc	3.42	3.18	6.35	12.7	2	JD	SW6010C	4H11025	08/21/14 16:21

ANALYSIS DATA SHEET

VWW06-SD046P-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 08:45
% Solids: 62.19

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-04
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	0.891	0.464	0.928	1.55	1	J	SW6010C	4H11025	08/19/14 20:18
7440-66-6	Zinc	3.27	3.09	6.18	12.4	2	JB	SW6010C	4H11025	08/21/14 16:25

JBC 11/20/14

ANALYSIS DATA SHEET

VWW06-SD046-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 08:50
% Solids: 58.37

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-05
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.18	0.504	1.01	1.68	1	J	SW6010C	4H11024	08/19/14 17:28
7440-66-6	Zinc	6.61	3.36	6.72	13.4	2	JB	SW6010C	4H11024	08/21/14 15:00

JAC 10/20/14

040

ANALYSIS DATA SHEET

VWW06-SD047-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 09:30
% Solids: 55.75

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-06
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	83.3	0.533	1.07	1.78	1		SW6010C	4H11024	08/19/14 17:42
7440-66-6	Zinc	125	1.78	3.55	7.10	1		SW6010C	4H11024	08/19/14 17:43

041

ANALYSIS DATA SHEET

VWW06-SD047-2430

Laboratory:	Empirical Laboratories, LLC	SDG:	1407232
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1407232-07
Sampled:	07/29/14 09:35	Received:	07/31/14 08:50
% Solids:	61.05		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.02	0.472	0.945	1.57	1	J	SW6010C	4H11024	08/19/14 17:47
7440-66-6	Zinc	4.67	3.15	6.30	12.6	2	JD	SW6010C	4H11024	08/21/14 15:04

JC 10/20/14

ANALYSIS DATA SHEET

VWW06-SD047-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 09:40
% Solids: 57.17

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-08
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.26	0.500	1.00	1.67	1	J	SW6010C	4H11024	08/19/14 17:52
7440-66-6	Zinc		3.33	6.66	13.3	2	U	SW6010C	4H11024	08/21/14 15:09

ANALYSIS DATA SHEET

VWW06-SD047-7278

Laboratory:	Empirical Laboratories, LLC	SDG:	1407232
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1407232-09
Sampled:	07/29/14 09:45	Received:	07/31/14 08:50
% Solids:	59.63		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.12	0.503	1.01	1.68	1	J	SW6010C	4H11024	08/19/14 17:36
7440-66-6	Zinc	6.34	3.35	6.71	13.4	2	JB	SW6010C	4H11024	08/21/14 15:11

ANALYSIS DATA SHEET

VWW06-SD048-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 10:25
% Solids: 49.18

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-10
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	183	0.587	1.17	1.96	1	J QT	SW6010C	4H11024	08/19/14 18:01
7440-66-6	Zinc	318	1.96	3.91	7.82	1	J QT	SW6010C	4H11024	08/19/14 18:01

SAC 10/30/14

ANALYSIS DATA SHEET

VWW06-SD048-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 10:30
% Solids: 55.97

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-11
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.20	0.536	1.07	1.79	1	J	SW6010C	4H11024	08/19/14 18:05
7440-66-6	Zinc		3.57	7.15	14.3	2	U	SW6010C	4H11024	08/21/14 15:18

ANALYSIS DATA SHEET

VWW06-SD048-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 10:35
% Solids: 59.13

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-12
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.11	0.483	0.966	1.61	1	J	SW6010C	4H11024	08/19/14 18:10
7440-66-6	Zinc	6.16	3.22	6.44	12.9	2	JB	SW6010C	4H11024	08/21/14 15:22

JBC 10/20/14

ANALYSIS DATA SHEET

VWW06-SD048P-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 10:40
% Solids: 58.61

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-13
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.04	0.512	1.02	1.71	1	J	SW6010C	4H11024	08/19/14 15:14
7440-66-6	Zinc	4.48	3.41	6.83	13.7	2	JB	SW6010C	4H11024	08/21/14 15:27

JBC 10/2014

ANALYSIS DATA SHEET

VWW06-SD048-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 10:45
% Solids: 56.58

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-14
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.20	0.538	1.06	1.77	1	J	SW6010C	4H11024	08/19/14 18:19
7440-66-6	Zinc	9.44	3.53	7.07	14.1	2	JB	SW6010C	4H11024	08/21/14 15:32

JLC 10-2014

ANALYSIS DATA SHEET

VWW06-SD049-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 12:35
% Solids: 56.27

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-15
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	211	0.518	1.04	1.73	1		SW6010C	4H11024	08/19/14 18:36
7440-66-6	Zinc	294	1.73	3.45	6.90	1		SW6010C	4H11024	08/19/14 18:36

JPC 10/2014

050

ANALYSIS DATA SHEET

VWW06-SD049-2636

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 12:40
% Solids: 48.12

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-16
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.44	0.611	1.22	2.04	1	J+ QT	SW6010C	4H11024	08/19/14 18:41
7440-66-6	Zinc	9.25	4.07	8.15	16.3	2	J QT	SW6010C	4H11024	08/21/14 15:36

SJC 10/30/14

ANALYSIS DATA SHEET

VWW06-SD049-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 12:45
% Solids: 59.07

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-17
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	0.847	0.503	1.01	1.68	1	J	SW6010C	4H11024	08/19/14 18:45
7440-66-6	Zinc	4.04	3.35	6.70	13.4	2	JB	SW6010C	4H11024	08/21/14 15:41

ANALYSIS DATA SHEET

VWW06-SD049-7278

Laboratory:	Empirical Laboratories, LLC	SDG:	1407232
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1407232-18
Sampled:	07/29/14 12:50	Received:	07/31/14 08:50
% Solids:	53.20		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.40	0.553	1.11	1.84	1	J	SW6010C	4H11024	08/19/14 18:50
7440-66-6	Zinc	12.3	3.69	7.37	14.7	2	JB	SW6010C	4H11024	08/21/14 15:58

ANALYSIS DATA SHEET

VWW06-SD050-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 13:30
% Solids: 37.91

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-19
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	290	0.768	1.54	2.56	1	J FD	SW6010C	4H11024	08/19/14 18:55
7440-66-6	Zinc	535	2.56	5.12	10.2	1	J QT	SW6010C	4H11024	08/19/14 18:55

JMC 10/30/14

ANALYSIS DATA SHEET

VWW06-SD050P-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 13:35
% Solids: 51.19

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-20
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	213	0.575	1.15	1.92	1	JPD	SW6010C	4H11024	08/19/14 18:59
7440-66-6	Zinc	422	1.92	3.83	7.66	1		SW6010C	4H11024	08/19/14 18:59

SMC 10-20-14

ANALYSIS DATA SHEET

VWW06-SD050-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 13:40
% Solids: 56.52

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-21
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.46	0.515	1.03	1.72	1	J	SW6010C	4H11024	08/19/14 19:04
7440-66-6	Zinc	5.13	3.44	6.87	13.7	2	JB	SW6010C	4H11024	08/21/14 16:03

ANALYSIS DATA SHEET

VWW06-SD050-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/29/14 13:45
% Solids: 63.61

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-22
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	0.840	0.458	0.916	1.53	1	J	SW6010C	4H11024	08/19/14 19:08
7440-66-6	Zinc	4.22	3.05	6.11	12.2	2	JB	SW6010C	4H11024	08/21/14 16:07

ANALYSIS DATA SHEET

VWW06-SD050-7278

Laboratory:	Empirical Laboratories, LLC	SDG:	1407232
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1407232-23
Sampled:	07/29/14 13:50	Received:	07/31/14 08:50
% Solids:	53.75		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.20	0.553	1.11	1.84	1	J	SW6010C	4H11024	08/19/14 19:13
7440-66-6	Zinc	11.7	3.68	7.37	14.7	2	JB	SW6010C	4H11024	08/21/14 16:12

JLC 10/20/14

058

ANALYSIS DATA SHEET

VWW06-EB01-073014

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Water
Sampled: 07/30/14 06:45

SDG: 1407232
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1407232-24
Received: 07/31/14 08:50

CAS NO.	Analyte	Conc. (ug/L)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead		1.50	3.00	5.00	1	U	SW6010C	4H11011	08/18/14 13:39
7440-66-6	Zinc		5.00	10.0	20.0	1	U	SW6010C	4H11011	08/18/14 13:39

JC 10/2/14

Sample Delivery Group Case Narrative

Receipt Information:

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision:

Revision 01: The package was revised to replace the "matrix spike", "matrix spike duplicate", and "duplicate" on the Analysis Data Sheets with the client ID of the parent sample at the request of the client.

Analytical Information:

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. Sample preparation and dilution information is provided within the final results report and at the beginning of each form set. The following information is provided specific to individual methods:

SW8082B:

Note – Sample 1407232-20 is qualified with a C9 for Aroclor-1016, Aroclor-1232, Aroclor-1242, and Aroclor-1248 to indicate that the DL and LOD were raised due to sample matrix interference.

The following surrogates exceeded criteria:

Tetrachloro-m-xylene with a negative bias on column 1 in 1407232-14; note - the sample was not re-extracted since the other 3 surrogates were within criteria

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

SW6010C:

No anomalies or deviations are noted

Data Qualifiers:

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

DL: The detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is supported by the method detection limit (MDL) which is determined from analysis of a sample containing the analyte in a given matrix.

LOD: The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM 4.2 revisions as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

LOQ: The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM 4.2 as the lowest concentration that produces a quantitative result within specified limits of precision and bias.

***:** Exceeding quality control criteria are associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. For Metals, the qualifier indicates that the serial dilution was outside of the control limits and the compound should be considered estimated due to the presence of interference.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time.

H3: The sample for this analyte was received outside of the EPA recommended holding time.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the LOQ. One should feel confident that the result is greater than zero and less than the LOQ.

061

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it indicates that the parameters DL/LOD/LOQ have been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The relative percent difference (RPD) and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

S: The associated internal standard exceeded criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

Z: The parameter shows lack of confirmation/detection, which may be due to a negative bias in the ICV or CCV which exceeds the lower control limit.

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.

B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.

C: The peak was manually integrated to correct the baseline from the original chromatogram.

D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.

E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

LIMS Definitions / Naming Conventions:

The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK

appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And **"RE"** implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, the Data Quality Manager, Technical Directors or Project Managers are authorized to sign this Statement of Data Authenticity.

Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

1407232

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 ♦ Nashville, TN 37228 ♦ 877-345-1113 ♦ (fax) 866-417-0548

23277 p. 1 of 2

Send Results to:	Send Invoice to:	Analysis Requirements:	Lab Use Only:
Name Juliana Dean	Name SAME	Metals 6010C, PCB 8082A	VOA Headspace Y N NA
Company CH2M Hill	Company		Field Filtered Y N NA
Address 5701 Cleveland St Suite 280	Address		Correct Containers Y N NA
City Virginia Beach	City		Discrepancies Y N NA
State, Zip VA 23462	State, Zip		Cust. Seals Intact Y N NA
Phone 757 671 6232	Phone		Containers Intact Y N NA
Fax	Fax		Airbill #
E-mail juliana.dean@ch2m.com	E-mail		CAR #
Project No./Name:	Sampler's (Signature):		

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres.
01	7/29/14 0830	VWW06-SD046-0006	SD	✓	✓		2	
02	7/29/14 0835	VWW06-SD046-2430	SD	✓	✓		2	
03	7/29/14 0840	VWW06-SD046-4854	SD	✓	✓		2	
04	7/29/14 0845	VWW06-SD046P-4854	SD	✓	✓		2	
05	7/29/14 0850	VWW06-SD046-7278	SD	✓	✓		2	
06	7/29/14 0930	VWW06-SD047-0006	SD	✓	✓		2	
07	7/29/14 0935	VWW06-SD047-2430	SD	✓	✓		2	
08	7/29/14 0940	VWW06-SD047-4854	SD	✓	✓		2	
09	7/29/14 0945	VWW06-SD047-7278	SD	✓	✓		2	
10	7/29/14 1025	VWW06-SD048-0006	SD	✓	✓		2	
11	7/29/14 1030	VWW06-SD048-2430	SD	✓	✓		2	
12	7/29/14 1035	VWW06-SD048-4854	SD	✓	✓		2	

Relinquished by: (Signature)	Date/Time: 0655 7/30/14	Received By: (Signature)
Relinquished by: (Signature)	Date/Time:	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time: 7/31/14 0850	Temperature: 4.7 in f

REMARKS:

Details:

Page ____ of ____

Cooler No ____ of ____

Date Shipped ____

Shipped By ____

Turnaround ____

Distribution: Original and yellow copies accompany sample shipment to laboratory: Pink retained by samplers

1407232

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 ♦ Nashville, TN 37228 ♦ 877-345-1113 ♦ (fax) 866-417-0548

23278

p. 2 of 2

Send Results to:	Send Invoice to:
Name Juliana Dean	Name SAME
Company CH2M Hill	Company
Address 5701 Cleveland St Suite 360	Address
City Virginia Beach, VA	City
State, Zip Virginia 23462	State, Zip
Phone 757 674 6232	Phone
Fax	Fax
E-mail juliana.dean@ch2m.com	E-mail
Project No./Name:	Sampler's (Signature):

Analysis Requirements: Metals 6010C; PCB 8082A

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres
13	7/29/14 1040	VWW06-SD048P-4854	SD	✓	✓		2	
14	7/29/14 1045	VWW06-SD048-7278	SD	✓	✓		2	
15	7/29/14 1235	VWW06-SD049-0006	SD	✓	✓		2	
16	7/29/14 1240	VWW06-SD049-2430	SD	✓	✓		2	
17	7/29/14 1245	VWW06-SD049-4854	SD	✓	✓		2	
18	7/29/14 1250	VWW06-SD049-7278	SD	✓	✓		2	
19	7/29/14 1330	VWW06-SD050-0006	SD	✓	✓		2	
20	7/29/14 1335	VWW06-SD050P-0006	SD	✓	✓		2	
21	7/29/14 1340	VWW06-SD050-2430	SD	✓	✓		2	
22	7/29/14 1345	VWW06-SD050-4854	SD	✓	✓		2	
23	7/29/14 1350	VWW06-SD050-7278	SD	✓	✓		2	
24	7/30/14 0645	VWW06-EB01-073014	AQ	✓	✓		3	

Relinquished by: (Signature)	Date/Time: 0655	Received By: (Signature)
[signature]	7/30/14	
Relinquished by: (Signature)	Date/Time:	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time: 7/31/14 850	Temperature: 4.7 int

REMARKS:

Details:

Page ____ of ____

Cooler No. ____ of ____

Date Shipped ____

Shipped By ____

Turnaround ____

Distribution: Original and yellow copies accompany sample shipment to laboratory. Pink retained by samplers.

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 07/31/14 0850 Workorder# 1407232

1. Tracking # 0982 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: 4.7 °C + correction factor (-0.3) = 4.4 °C

3. If item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO (NA)

4. Were custody seals on outside of cooler? (YES) NO NA

   If yes, how many and where: 1 front

5. Were the seals intact, signed, and dated correctly? (YES) NO NA

6. Were custody papers inside cooler? (YES) NO NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) TH 7/31/14

7. Were custody seals on containers: YES (NO) and intact YES NO (NA)

   Were these signed and dated correctly? YES NO (NA)

8. Packing material used? Bubblewrap (Plastic bag) Peanuts Vermiculite Foam insert Paper Other None

9. Cooling process: (Ice) Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES) NO NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES) NO NA

12. Did all container labels and tags agree with custody papers? (YES) NO NA

13. a. Were VOA vials received? YES (NO) NA

    b. Was there any observable headspace present in any VOA vial? YES NO (NA)

14. Was there a Trip Blank in this cooler? YES NO (NA) If multiple coolers, sequence # ____

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) TH 7/31/14

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? (YES) NO NA

    b. Did the bottle labels indicate that the correct preservatives were used (YES) NO NA

16. Was residual chlorine present? YES (NO) NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) TH 7/31/14

17. Were custody papers properly filled out (ink, signed, etc)? (YES) NO NA

18. Did you sign the custody papers in the appropriate place? (YES) NO NA

19. Were correct containers used for the analysis requested? (YES) NO NA

20. Was sufficient amount of sample sent in each container? (YES) NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial/date) TH 7/31/14

I certify that I attached a label with the unique LIMS number to each container (initial/date) TH 7/31/14

I certify that I have performed a second check of the LIMS information against the COC to confirm accuracy (initial/date) TG 8/4/14

21. Were there Non-Conformance issues at login? YES (NO) Was a NCR generated? YES (NO) #____

Additional Details:

Holding Times

Sampling Date: 7/29
Received Date: 7/31
Extraction Date: 8/5, 8/6 – PCBs
Analysis Dates: 8/4, 8/6, 8/8, 8/11 – PCBs

The samples in this SDG were validated according to the recommendations in the Region II SOP NO. HW-37 Rev 3, 5/2013 and the QC limits published in the project specific SAP.

Receipt paperwork was in order. Cooler temperatures were acceptable. A seven-day holding time was used for the water samples and a fourteen-day holding time was used for the soil samples. The analysis holding time of 40 days was used. Based on this, all extraction and analysis holding times were met.

All samples exhibited percent solids values >30% so no qualifications were required.

Calibrations

8082 PCB: Initial calibrations were performed according to the method with a six-point curve for AR1016, AR1242, AR1254, & AR1260 as the representative PCBs. Response factors were calculated. %RSDs were within QC limits. All ICV criteria were met (avg. %Ds were met). Continuing calibration standards were analyzed appropriately (for 1016, 1242 & 1260). All CCVs exhibited acceptable %Ds (avg. %Ds were met). Column resolution was acceptable. Standard retention times were stable throughout the analytical sequences. The correct analytical sequences were run. Raw data and calculations were verified.

Blank Summary

Blank qualification guidelines:

- No action is taken if a compound is found in the blank but not in the sample.
- Any compound detected in the sample, and the associated blank, must be qualified by reporting the result in the sample as non-detect at the LOD when the sample concentration is less than LOD.
- Sample weight, volume or dilution factor must be taken into consideration when applying the qualification criteria.
- Apply the same data validation guidelines to any associated rinse and field blanks and all associated samples.
- Qualification/Action codes:
  - No Action – The sample result is greater than the LOD and greater than five times (5X) the blank value.
  - U at LOD- The sample result is less than the LOD when the blank contamination level is less than the LOD.

Professional judgment is applied when blank concentrations are >LOD. Results may be flagged as U at the reported concentration or rejected. No contamination that resulted in qualification of the data was noted in the associated method or instrument blanks or the submitted field QC blanks.

Blank ID	Compound	Concentration	Action Level	Q Flag
no contamination was noted				

Surrogate Recoveries

Surrogate recoveries met criteria in all samples in this SDG with the exception of a single recovery that was slightly low. No qualifications were required.

Matrix Spike/Matrix Spike Duplicates

The MS/MSD samples analyzed for this SDG were acceptable for all recoveries and RPDs in the original runs. No qualifications were required.

Laboratory Control Samples

The LCS samples exhibited acceptable recoveries and RPDs. No qualifications were required.

Field Duplicate Sample Summary

There were three field duplicate pairs in this SDG. No qualifications were necessary. See the worksheet following this page for details.

Sample Result Verification

Reported sample results were verified. Raw data and calculations were verified. Three reported positive results exhibited column quantitation %D's that were >40%. The results were qualified as estimated J.

Reviewer: _____ Date: _____

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD046-4854
Duplicate Sample ID: VWW06-SD046P-4854

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: no positive results reported in either sample

Sample ID: VWW06-SD048-4854
Duplicate Sample ID: VWW06-SD048P-4854

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: no positive results reported in either sample

Sample ID: VWW06-SD050-0006
Duplicate Sample ID: VWW06-SD050P-0006

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
AR1254	87.6	75.9	14
Total AR1254	87.6	75.9	14
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: no qualifications were required.

SAMPLE CALCULATION - SDG 1407232

Sample ID: VWW06-SD049-0006
Standard ID: ICAL 7/24-26/14
Compound: AR1254
Concentration: 16.1 ug/Kg (average of at least 3 peaks)
Calculation shows Peak 1: 15.45 ug/Kg

	Water (ug/L)	Soil (ug/Kg)
Area of Compound		83553
CF of Compound		3183.042
Final Volume		5
Dilution Factor		1
Split Factor		1
Injection Volume		1
Weight of Sample	na	15.1
Initial Volume of Sample		NA
Conversion Factor		1
Percent Solids Factor		0.5627
Concentration	#DIV/0!	15.44670

Peak #	Concentration
1	15.45
2	19.15
3	
4	
5	13.7
Total	**16.1**

Initial Calibration Date: 7/24-25-14, Instrument GL-ECD3

RRF and %RSD Calculations:

Compound Name: Cal3 at 750/75, Std. 14G0434, AR1660 peak 2 in level 3
Lab Value: 2054.3000

Area of Compound	1540725
Conc. of Compound	750
Calculated CF	2054.300

Compound Name: AR1260 Peak 2
Lab Value: 6.4

CF of STD 1	1883.529
CF of STD 2	1962.644
CF of STD 3	2054.300
CF of STD 4	2133.612
CF of STD 5	2036.520
CF of STD 6	2259.440
CF of STD 7	
CF of STD 8	
Calculated % RSD	6.39

Continuing Calibration File ID: 8/6/14, 1953, AR1260 Peak 4

RRF and %D Calculations:

Compound Name: AR1260, peak 4
Lab Value: 1908.9860

Area of Compound	1908986
Conc. of Compound	1000
Calculated CF	1908.986

Compound Name: AR1260, peak 4
Lab Value: 3.0

Average CF	1852.887
CF of CCV	1908.986
Calculated % D	-3.0

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

VWW06-SD046-0006

Lab Name: Empirical Laboratories, LLC

Lab Sample ID: 1407232-01 Date(s) Analyzed: 08/08/2014 08/08/2014

Instrument ID (1): GL-ECD3 Instrument ID (2): GL-ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	4.58	4.84	4.90	23.4	
	2	5.81	6.14	6.20	45.6	64

172

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

VWW06-5D04B-0006

Lab Name: Empirical Laboratories, LLC

Lab Sample ID: 1407232-10 Date(s) Analyzed: 08/08/2014 08/08/2014

Instrument ID (1): GL-ECD3 Instrument ID (2): GL-ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	4.58	4.84	4.90	46.6	
	2	5.35	6.14	6.20	114	84

073

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

VWW06-SD019-0006

Lab Name: Empirical Laboratories, LLC

Lab Sample ID: 1407232-15 Date(s) Analyzed: 08/08/2014 08/08/2014

Instrument ID (1): GL-ECD3 Instrument ID (2): GL-ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	4.58	4.84	4.90	16.1	
	2	5.81	6.14	6.20	53.8	108

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

VWW06-SD050-0006

Lab Name: Empirical Laboratories, LLC

Lab Sample ID: 1407232-19 Date(s) Analyzed: 08/08/2014 08/08/2014

Instrument ID (1): GL-ECD3 Instrument ID (2): GL-ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	4.58	4.84	4.90	46.2	
	2	5.81	6.14	6.20	87.6	62

075

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

VMW06-SD050P-0006

Lab Name: Empirical Laboratories, LLC

Lab Sample ID: 1407232-20 Date(s) Analyzed: 08/08/2014 08/08/2014

Instrument ID (1): GL-ECD3 Instrument ID (2): GL-ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	4.58	4.84	4.90	42.9	
	2	5.81	6.14	6.20	75.9	56

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1407232
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H21905	Instrument:	GL-ECD3
		Calibration:	4209006

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
VWW06-SD048P-4854 (1407232-13) ug/Kg dry				Lab File ID: 056F5601.D		Analyzed: 08/07/14 01:04		
Tetrachloro-m-xylene	26.76	84.7	70 - 125	2.489	2.496	-0.0070	+/-0.030	
Tetrachloro-m-xylene [2C]	26.76	85.6	70 - 125	2.959	2.963	-0.0040	+/-0.030	
Decachlorobiphenyl	26.76	84.9	60 - 125	7.292	7.301	-0.0090	+/-0.030	
Decachlorobiphenyl [2C]	26.76	84.9	60 - 125	8.104	8.108	-0.0040	+/-0.030	
VWW06-SD048-7278 (1407232-14) ug/Kg dry				Lab File ID: 057F5701.D		Analyzed: 08/07/14 01:17		
Tetrachloro-m-xylene	28.90	68.4	70 - 125	2.489	2.496	-0.0070	+/-0.030	*
Tetrachloro-m-xylene [2C]	28.90	70.3	70 - 125	2.959	2.963	-0.0040	+/-0.030	
Decachlorobiphenyl	28.90	66.6	60 - 125	7.291	7.301	-0.0100	+/-0.030	
Decachlorobiphenyl [2C]	28.90	66.7	60 - 125	8.103	8.108	-0.0050	+/-0.030	
VWW06-SD049-2636 (1407232-16) ug/Kg dry				Lab File ID: 059F5901.D		Analyzed: 08/07/14 01:43		
Tetrachloro-m-xylene	34.50	84.1	70 - 125	2.489	2.496	-0.0070	+/-0.030	
Tetrachloro-m-xylene [2C]	34.50	87.1	70 - 125	2.961	2.963	-0.0020	+/-0.030	
Decachlorobiphenyl	34.50	76.9	60 - 125	7.292	7.301	-0.0090	+/-0.030	
Decachlorobiphenyl [2C]	34.50	77.8	60 - 125	8.104	8.108	-0.0040	+/-0.030	
VWW06-SD049-4854 (1407232-17) ug/Kg dry				Lab File ID: 060F6001.D		Analyzed: 08/07/14 01:56		
Tetrachloro-m-xylene	27.13	88.7	70 - 125	2.488	2.496	-0.0080	+/-0.030	
Tetrachloro-m-xylene [2C]	27.13	89.9	70 - 125	2.96	2.963	-0.0030	+/-0.030	
Decachlorobiphenyl	27.13	88.8	60 - 125	7.292	7.301	-0.0090	+/-0.030	
Decachlorobiphenyl [2C]	27.13	88.7	60 - 125	8.103	8.108	-0.0050	+/-0.030	
VWW06-SD049-7278 (1407232-18) ug/Kg dry				Lab File ID: 061F6101.D		Analyzed: 08/07/14 02:09		
Tetrachloro-m-xylene	30.08	79.1	70 - 125	2.49	2.496	-0.0060	+/-0.030	
Tetrachloro-m-xylene [2C]	30.08	80.4	70 - 125	2.96	2.963	-0.0030	+/-0.030	
Decachlorobiphenyl	30.08	80.5	60 - 125	7.291	7.301	-0.0100	+/-0.030	
Decachlorobiphenyl [2C]	30.08	80.9	60 - 125	8.102	8.108	-0.0060	+/-0.030	
Calibration Check (4H21905-CCVD) ug/L				Lab File ID: 062F6201.D		Analyzed: 08/07/14 02:22		
Tetrachloro-m-xylene	100.0	103	80 - 120	2.49	2.496	-0.0060	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	102	80 - 120	2.96	2.963	-0.0030	+/-0.030	
Decachlorobiphenyl	100.0	97.0	80 - 120	7.292	7.301	-0.0090	+/-0.030	
Decachlorobiphenyl [2C]	100.0	96.0	80 - 120	8.103	8.108	-0.0050	+/-0.030	

NQ

F77

This SDG contains 23 solid matrix samples and 1QC blank samples analyzed for select metals using SW-846 methods 6010C. Region II validation guidelines were applied (updated 12/20/12) and these worksheets are submitted along with marked up pages from the data package and annotated form 1s and EDD files.

HOLDING TIMES

Sampling Date: 7/29
Received Date: 7/31
Prep. Dates: 8/11, 8/132
Analysis Dates: 8/18, 8/19, 8/21

All preparation & analysis holding time requirements were met. Cooler temps were acceptable and receipt paperwork was in order. All except three samples exhibited solids values >50%. The results in the three samples were qualified as estimated J/UJ.

CALIBRATIONS

All initial calibration criteria were met for the methods noted above. All ICV, CCV and low calibration standard criteria were met or associated samples were reanalyzed against acceptable QC standards. PQL standard criteria were met. ICSA/ICSAB results were within method criteria for all analytes. Raw data was verified.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- See blank type specific validation guidelines noted below (taken from the Region II SOP for CLP metals and adapted to this project).
- Qualification/Action codes:

Note: non-detect results are reported to the LOD so the LOD is the RL for this project.

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the reporting limit, when the ICB/CCB/PB result is less than the RL.
R -	Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
J/UJ -	Sample result is less than 10X RL when blank result is below the negative RL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.
Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL when the field blank result is greater than the RL - result is reported as non-detect at the reporting limit.
R -	Sample result is greater than the RL and less than the field blank value when the field blank result is greater than the RL.
J -	Sample result is greater than the field blank value but less than 10X the field blank value when field blank result is greater than the RL.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	Action Level	Q Flag
no contamination was noted in the associated blanks				

See validation report for specific samples and qualifications. Only those analytes requiring action are listed here. Negative contamination in a prep blank or CCB, if less than the analyte CRDL, is qualified based on professional judgment. Field QC blank associations are determined using tracking provided by the client. Flags are applied to samples based on these associations. The concentration noted for the CCBs is the highest concentration in all the associated

CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for CCB contamination.

MATRIX SPIKE/DUPLICATE SUMMARY

Qualifications were made based on the 12/12 revision of the Region II guidance SOPs which flags only the native sample for spike and spike dup recovery and RPD issues. The submitted PDS spikes were also considered in the evaluation of the spike data.

There was no MS/MSD pair analyzed in this SDG. All associated LCS recoveries were acceptable also.

SERIAL DILUTIONS

The laboratory submitted acceptable serial dilution analyses. No qualifications were required.

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments. Dilutions were performed. The raw data and calculations were verified. Field duplicates were assessed – see the following page for results and qualifications if needed.

Reviewer _____ **Date:** _____

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD046-4854
Duplicate Sample ID: VWW06-SD046P-4854

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	0.972	0.891	9
zinc	3.42	3.27	4

COMMENTS: No qualifications were required.
*30% RPD limit for all analytes >5X LOD - results in both samples flagged J

Sample ID: VWW06-SD048-4854
Duplicate Sample ID: VWW06-SD0478-4854

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	1.11	1.04	7
zinc	6.16	4.48	32

COMMENTS: No qualifications were required - results in zinc were <5X LOD
*30% RPD limit for all analytes >5X LOD - results in both samples flagged J

Sample ID: VWW06-SD050-0006
Duplicate Sample ID: VWW06-SD050P-0006

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	290	213	31
zinc	535	422	24

COMMENTS: Flag the analyte lead as estimated J in both samples.
*30% RPD limit for all analytes >5X LOD - results in both samples flagged J

CH2MHILL VIEQUES SWMU6 CTO-113

SDG 1407232

Reporting Limit Calcs

ICP - AES	
SAMPLE ID	VWW06-SD050-7278
ANALYTE	lead
Form 1 LOD or LOQ Value (mg/Kg)	1.11
Analyte LOD or LOQ	0.6
SAMPLE SIZE (g)	1.01
DILUTION FACTOR	1
DRYNESS FACTOR	0.5375
Corrected LOD or LOQ (mg/Kg)	1.105

CH2M HILL VIEQUES CTO-113

SDG 1407232

METALS CALCULATIONS

ICP - AES	
SAMPLE ID	VWW06-SD048-7278
ANALYTE	zinc
Lab Value CONCENTRATION (ug/Kg)	9.44
AMOUNT FROM RAW DATA (ug/L)	13.351
SAMPLE SIZE (g)	1
FINAL VOLUME (L)	0.2
DILUTION FACTOR	2
DRYNESS FACTOR	0.5658
CONVERSION FACTOR (g TO Kg)	1
CALCULATED CONCENTRATION (ug/Kg)	9.44

DataQual

Environmental Services, LLC

CH2M HILL-VBO
5701 Cleveland Street
Suite 200
Virginia Beach, VA 23462

October 28, 2014
SDG# 1408002; Empirical Laboratories, LLC
Vieques CTO-113, SWMU6—Naval Training Range

Dear Ms. Dean,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1408002. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, professional judgment, and the guidance offered in the region II SOPs HW-2a Revision 15, December 2012, for ICP-AES data validation and HW-37 Revision 3, May 2013, for PCB data validation. The DoD Quality Systems Manual for Environmental Laboratories Version 4.2 and the project specific SAP were also consulted. Worksheets tabulating the validation process including calculation verifications are included in the support documentation section of this report. All areas of concern are discussed in the body of the report and a summary of data qualifications are provided.

Sample ID	Lab ID	Matrix	PCB	Pb, Zn
VWW06-SD055-0006	1408002-01	soil	X	X
VWW06-SD055-2430	1408002-02	soil	X	X
VWW06-SD055P-2430	1408002-03	soil	X	X
VWW06-SD055-4854	1408002-04	soil	X	X
VWW06-SD055-7278	1408002-05	soil	X	X
VWW06-SD040-0006	1408002-06	soil	X	X
VWW06-SD040-2430	1408002-07	soil	X	X
VWW06-SD040-4854	1408002-08	soil	X	X
VWW06-SD040-7278	1408002-09	soil	X	X
VWW06-SD041-0006	1408002-10	soil	X	X
VWW06-SD041-2430	1408002-11	soil	X	X
VWW06-SD041-4854	1408002-12	soil	X	X
VWW06-SD041-7278	1408002-13	soil	X	X
VWW06-SD041-7278MS	1408002-13MS	soil	X	X
VWW06-SD041-7278MSD	1408002-13MSD	soil	X	X
VWW06-SD042-0006	1408002-14	soil	X	X
VWW06-SD042-2430	1408002-15	soil	X	X
VWW06-SD042P-2430	1408002-16	soil	X	X
VWW06-SD042-4854	1408002-17	soil	X	X
VWW06-SD042-7278	1408002-18	soil	X	X
VWW06-SD043-0006	1408002-19	soil	X	X
VWW06-SD043-2430	1408002-20	soil	X	X
VWW06-SD043-4854	1408002-21	soil	X	X
VWW06-SD043-7278	1408002-22	soil	X	X
VWW06-EB01-073114	1408002-23	water	X	X

The following quality control samples were provided with this SDG: sample VWW06-SD055P-2430-field duplicate of sample VWW06-SD055-2430; sample VWW06-SD042P-2430-field duplicate of sample VWW06-SD042-2430; and rinse blank sample VWW06-EB01-073114.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition
- Technical Holding Times *
- Initial/Continuing Calibrations *
- ICSA/ICSAB Standards *
- Low Level Standards *
- Blanks *
- Surrogate Recoveries
- Laboratory Control Samples *
- Matrix Spike Recoveries *
- Matrix Duplicate RPDs *
- Serial Dilutions *
- Field Duplicates
- Identification/Quantitation
- Reporting Limits *

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. *If an issue is not addressed in this narrative there were no actions required based on unmet quality control criteria.*

No critical findings resulting in data rejections were noted. Some major findings resulting in qualification of data as estimated were noted. The majority of the data is reported without qualification.

PCBs

Qualifications were required based on non-compliant surrogate recoveries.

One reported positive result exhibited a column quantitation %D greater than the 40% RPD criteria from the project specific SAP and qualifications were required.

Select Metals Pb & Zn

Two samples exhibited high (>50%) moisture content (based on Region II requirements). All reported results in these samples were qualified as estimated J/UJ.

One of the field duplicate pairs exhibited RPDs greater than the 30% RPD criteria from the project specific SAP and qualifications were required.

Specific Evaluation of Data

Data Completeness

The SDG was received complete and intact. Updated MS/MSD results forms that included the client sample ID were requested and received from the laboratory.

Technical Holding Times

According to chain of custody records, sampling was performed on 7/30/14 and samples were received at the laboratory 8/1/14. All sample preparation and analysis was performed within Region II and/or method holding time requirements.

Sample Condition

Select Metals, Pb & Zn

Two samples exhibited high moisture content (%solids < 50%) as noted in the following table. All reported results were qualified as estimated J/UJ based on the Region II guidance.

Sample ID	%Solids	Q Flag	Q Code
VWW06-SD042-0006	42.45	J/UJ	OT
VWW06-SD043-0006	40.88		

Surrogate Recoveries

PCBs

Several samples exhibited non-compliant recoveries as noted in the following table. Results required qualifications as noted.

Sample ID	Surrogate	%R	QC Limits	Q Flag	Q Code
VWW06-EB01-073114	DCB	22.12/24.2	40-135	J-/UJ	SSL
VWW06-SD041-7278	TCMX	63.9/67.9	70-125		

Field Duplicates

Select Metals, Pb & Zn

The field duplicate pair of samples VWW06-SD055-2430 & VWW06-SD055P-2430 exhibited a high RPD (> 30%) for lead (46%) and zinc (42%). The reported results are qualified as estimated J with a qualifier code of FD.

Compound Identification/Quantitation

PCBs

One positive result exhibited a positive result for AR1254 with a column quantitation %D >40% (based on the SAP requirement) at 58%. The result reported for AR1254 in sample VWW06-SD055-0006 is qualified as estimated J with a qualifier code of 2C.

Please note that the reporting limits for several non-detect results in samples VWW06-SD043-0006 were raised due to matrix interferences. This is a valid action but does not require a validation qualifier. Therefore the C9 lab qualifier is removed from the sample results.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Jacqueline Cleveland

Jacqueline Cleveland
Vice President

Summary of Data Qualifications

PCBs

Sample ID	Compounds	Results	Q Flag	Q Code
VWW06-EB01-073114, VWW06-SD041-7278	all compounds	+/-	J/UJ	SSL
VWW06-SD055-0006	AR1254 total Aroclors	+P	J	2C

Select Metals – Pb & Zn

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-SD042-0006, VWW06-SD043-0006	all analytes	+/-	J/UJ	OT
VWW06-SD055-2430, VWW06-SD055P-2430	lead zinc	*	J	FD

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
J+	estimated biased high
J-	estimated biased low
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the LOD (2X sample LOD for common laboratory contaminants) when the blank value is less than the LOD. The sample result for the blank contaminant is not qualified with any blank qualifiers.
LOD	The sample result for the blank contaminant is less than the LOD (2X sample LOD for common laboratory contaminants) but greater than the MDL when the blank value is less than the LOD. The sample result for the blank contaminant is changed to the LOD and qualified as non-detect U.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the ICB/CCB/PB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the LOD.
J+ -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the LOD.
J/UJ -	Sample result is less than 10X LOD when blank result is below the negative LOD.

Glossary of Qualification Flags and Abbreviations, continued

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.

Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD when the FB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the FB value when the FB value is greater than the LOD.
J+ -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the LOD.

General Abbreviations

MDL	method detection limit
IDL	instrument detection limit
LOD/RL	Level of Detection//Reporting Limit
LOQ	Level of Quantitation
+	positive result
-	non-detect result

ANALYSIS DATA SHEET

VWW06-SD055-0006

Laboratory	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-01	File ID:	0435F4501.D
Sampled:	07/30/14 09:00	Prepared:	08/06/14 11:36	Analyzed:	08/26/14 22:30
Solids:	32.33	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence:	4H2391.2	Calibration:	4232001

Instrument: GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	76.7	15.2	20.3	60.8	J 2C
12674-11-2	Aroclor-1016		7.61	15.2	30.5	U
11104-28-2	Aroclor-1221		7.61	15.2	30.5	U
11141-16-5	Aroclor-1232		7.61	15.2	30.5	U
53469-21-9	Aroclor-1242 [2C]		7.61	15.2	30.5	U
12672-29-6	Aroclor-1248		7.61	15.2	30.5	U
11097-69-1	Aroclor-1254 [2C]	54.6	7.61	15.2	30.5	J 2C
11096-82-5	Aroclor-1260 [2C]	22.1	7.61	15.2	30.5	J
37324-23-5	Aroclor-1262		7.61	15.2	30.5	U
11100-14-4	Aroclor-1268		7.61	15.2	30.5	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.41	24.67	81.1	70 - 125	
Tetrachloro-m-xylene [2C]	30.41	25.10	82.5	70 - 125	
Decachlorobiphenyl	30.41	23.14	76.1	60 - 125	
Decachlorobiphenyl [2C]	30.41	25.75	84.7	60 - 125	

SAC 11/4/14

ANALYSIS DATA SHEET

VWW06-SD055-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-02	File ID:	062R6201.D
Sampled:	07/30/14 09:05	Prepared:	08/06/14 11:36	Analyzed:	08/12/14 00:25
Solids:	58.99	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H22502	Calibration:	4209006	Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.7	18.3	54.9	U
12674-11-2	Aroclor-1016		6.88	13.7	27.6	U
11104-28-2	Aroclor-1221		6.88	13.7	27.6	U
11141-16-5	Aroclor-1232		6.88	13.7	27.6	U
53469-21-9	Aroclor-1242		6.88	13.7	27.6	U
12672-29-6	Aroclor-1248		6.88	13.7	27.6	U
11097-69-1	Aroclor-1254		6.88	13.7	27.6	U
11096-82-5	Aroclor-1260		6.88	13.7	27.6	U
37324-23-5	Aroclor-1262		6.88	13.7	27.6	U
11100-14-4	Aroclor-1268		6.88	13.7	27.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.50	21.01	76.4	70 - 125	
Tetrachloro-m-xylene [2C]	27.50	22.51	81.9	70 - 125	
Decachlorobiphenyl	27.50	20.34	74.0	60 - 125	
Decachlorobiphenyl [2C]	27.50	20.92	76.1	60 - 125	

JAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD055P-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-03	File ID:	066F6601.D
Sampled:	07/30/14 09:10	Prepared:	08/06/14 11:36	Analyzed:	08/12/14 01:17
Solids:	54.54	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence:	4H22502	Calibration:	4209006
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.9	19.8	59.5	U
12674-11-2	Aroclor-1016		7.46	14.9	29.9	U
11104-28-2	Aroclor-1221		7.46	14.9	29.9	U
11141-16-5	Aroclor-1232		7.46	14.9	29.9	U
53469-21-9	Aroclor-1242		7.46	14.9	29.9	U
12672-29-6	Aroclor-1248		7.46	14.9	29.9	U
11097-69-1	Aroclor-1254		7.46	14.9	29.9	U
11096-82-5	Aroclor-1260		7.46	14.9	29.9	U
37324-23-5	Aroclor-1262		7.46	14.9	29.9	U
11100-14-4	Aroclor-1268		7.46	14.9	29.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.80	23.94	80.3	70 - 125	
Tetrachloro-m-xylene [2C]	29.80	26.30	88.2	70 - 125	
Decachlorobiphenyl	29.80	23.81	79.9	60 - 125	
Decachlorobiphenyl [2C]	29.80	24.32	81.6	60 - 125	

SJC 10/3/14

ANALYSIS DATA SHEET

VWW06-SD055-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-04	File ID:	067F6701.D
Sampled:	07/30/14 09:15	Prepared:	08/06/14 11:36	Analyzed:	08/12/14 01:30
Solids:	53.74	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H22502	Calibration:	4209006	Instrument: GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.0	20.0	60.0	U
12674-11-2	Aroclor-1016		7.51	15.0	30.1	U
11104-28-2	Aroclor-1221		7.51	15.0	30.1	U
11141-16-5	Aroclor-1232		7.51	15.0	30.1	U
53469-21-9	Aroclor-1242		7.51	15.0	30.1	U
12672-29-6	Aroclor-1248		7.51	15.0	30.1	U
11097-69-1	Aroclor-1254		7.51	15.0	30.1	U
11096-82-5	Aroclor-1260		7.51	15.0	30.1	U
37324-23-5	Aroclor-1262		7.51	15.0	30.1	U
11100-14-4	Aroclor-1268		7.51	15.0	30.1	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.03	24.25	80.7	70 - 125	
Tetrachloro-m-xylene [2C]	30.03	25.20	83.9	70 - 125	
Decachlorobiphenyl	30.03	25.69	85.5	60 - 125	
Decachlorobiphenyl [2C]	30.03	26.16	87.1	60 - 125	

JAC 10/3/14

ANALYSIS DATA SHEET

VWW06-SD055-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-05	File ID:	068F6801.D
Sampled:	07/30/14 09:20	Prepared:	08/06/14 11:36	Analyzed:	08/12/14 01:43
Solids:	54.41	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence:	4H22502	Calibration:	4209006

Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.9	19.8	59.5	U
12674-11-2	Aroclor-1016		7.45	14.9	29.8	U
11104-28-2	Aroclor-1221		7.45	14.9	29.8	U
11141-16-5	Aroclor-1232		7.45	14.9	29.8	U
53469-21-9	Aroclor-1242		7.45	14.9	29.8	U
12672-29-6	Aroclor-1248		7.45	14.9	29.8	U
11097-69-1	Aroclor-1254		7.45	14.9	29.8	U
11096-82-5	Aroclor-1260		7.45	14.9	29.8	U
37324-23-5	Aroclor-1262		7.45	14.9	29.8	U
11100-14-4	Aroclor-1268		7.45	14.9	29.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.76	21.50	72.2	70 - 125	
Tetrachloro-m-xylene [2C]	29.76	22.63	76.1	70 - 125	
Decachlorobiphenyl	29.76	22.92	77.0	60 - 125	
Decachlorobiphenyl [2C]	29.76	23.26	78.2	60 - 125	

JLC 10/13/14

012

ANALYSIS DATA SHEET

VWW06-SD040-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-06	File ID:	046F4601.D
Sampled:	07/30/14 09:45	Prepared:	08/06/14 11:36	Analyzed:	08/26/14 22:45
Solids:	51.78	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.7	20.9	62.7	U
12674-11-2	Aroclor-1016		7.85	15.7	31.4	U
11104-28-2	Aroclor-1221		7.85	15.7	31.4	U
11141-16-5	Aroclor-1232		7.85	15.7	31.4	U
53469-21-9	Aroclor-1242 [2C]		7.85	15.7	31.4	U
12672-29-6	Aroclor-1248		7.85	15.7	31.4	U
11097-69-1	Aroclor-1254 [2C]		7.85	15.7	31.4	U
11096-82-5	Aroclor-1260		7.85	15.7	31.4	U
37324-23-5	Aroclor-1262		7.85	15.7	31.4	U
11100-14-4	Aroclor-1268		7.85	15.7	31.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.37	30.51	97.3	70 - 125	
Tetrachloro-m-xylene [2C]	31.37	30.83	98.3	70 - 125	
Decachlorobiphenyl	31.37	29.81	95.0	60 - 125	
Decachlorobiphenyl [2C]	31.37	32.81	105	60 - 125	

SAC 10/3/14

ANALYSIS DATA SHEET

VWW06-SD040-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-07	File ID:	070F7001.D
Sampled:	07/30/14 09:50	Prepared:	08/06/14 11:36	Analyzed:	08/12/14 02:09
Solids:	56.33	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H22502	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.3	19.0	57.1	U
12674-11-2	Aroclor-1016		7.15	14.3	28.7	U
11104-28-2	Aroclor-1221		7.15	14.3	28.7	U
11141-16-5	Aroclor-1232		7.15	14.3	28.7	U
53469-21-9	Aroclor-1242		7.15	14.3	28.7	U
12672-29-6	Aroclor-1248		7.15	14.3	28.7	U
11097-69-1	Aroclor-1254		7.15	14.3	28.7	U
11096-82-5	Aroclor-1260		7.15	14.3	28.7	U
37324-23-5	Aroclor-1262		7.15	14.3	28.7	U
11100-14-4	Aroclor-1268		7.15	14.3	28.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	28.60	25.94	90.7	70 - 125	
Tetrachloro-m-xylene [2C]	28.60	23.64	82.7	70 - 125	
Decachlorobiphenyl	28.60	22.95	80.3	60 - 125	
Decachlorobiphenyl [2C]	28.60	23.16	81.0	60 - 125	

SJC 10/3/14

ANALYSIS DATA SHEET

VWW06-SD040-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-08	File ID:	071F7101.D
Sampled:	07/30/14 09:55	Prepared:	08/06/14 11:36	Analyzed:	08/12/14 02:22
Solids:	55.80	Preparation:	EXT_3546	Dilution:	1

Batch: 4H04018 Sequence: 4H22502 Calibration: 4209006 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.8	19.8	59.3	U
12674-11-2	Aroclor-1016		7.43	14.8	29.7	U
11104-28-2	Aroclor-1221		7.43	14.8	29.7	U
11141-16-5	Aroclor-1232		7.43	14.8	29.7	U
53469-21-9	Aroclor-1242		7.43	14.8	29.7	U
12672-29-6	Aroclor-1248		7.43	14.8	29.7	U
11097-69-1	Aroclor-1254		7.43	14.8	29.7	U
11096-82-5	Aroclor-1260		7.43	14.8	29.7	U
37324-23-5	Aroclor-1262		7.43	14.8	29.7	U
11100-14-4	Aroclor-1268		7.43	14.8	29.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.69	22.60	76.1	70 - 125	
Tetrachloro-m-xylene [2C]	29.69	23.52	79.2	70 - 125	
Decachlorobiphenyl	29.69	24.05	81.0	60 - 125	
Decachlorobiphenyl [2C]	29.69	24.11	81.2	60 - 125	

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025

ANALYSIS DATA SHEET

VWW06-SD040-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-09	File ID:	072F7201.D
Sampled:	07/30/14 10:00	Prepared:	08/06/14 11:36	Analyzed:	08/12/14 02:35
Solids:	53.75	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H22502	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.8	19.7	59.2	U
12674-11-2	Aroclor-1016		7.41	14.8	29.7	U
11104-28-2	Aroclor-1221		7.41	14.8	29.7	U
11141-16-5	Aroclor-1232		7.41	14.8	29.7	U
53469-21-9	Aroclor-1242		7.41	14.8	29.7	U
12672-29-6	Aroclor-1248		7.41	14.8	29.7	U
11097-69-1	Aroclor-1254		7.41	14.8	29.7	U
11096-82-5	Aroclor-1260		7.41	14.8	29.7	U
37324-23-5	Aroclor-1262		7.41	14.8	29.7	U
11100-14-4	Aroclor-1268		7.41	14.8	29.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.63	23.81	80.4	70 - 125	
Tetrachloro-m-xylene [2C]	29.63	24.99	84.4	70 - 125	
Decachlorobiphenyl	29.63	28.38	95.8	60 - 125	
Decachlorobiphenyl [2C]	29.63	28.57	96.4	60 - 125	

JAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD041-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-10	File ID:	047F4701.D
Sampled:	07/30/14 10:30	Prepared:	08/06/14 11:36	Analyzed:	08/26/14 22:59
Solids:	54.01	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	39.7	14.9	19.9	59.6	J
12674-11-2	Aroclor-1016		7.46	14.9	29.9	U
11104-28-2	Aroclor-1221		7.46	14.9	29.9	U
11141-16-5	Aroclor-1232		7.46	14.9	29.9	U
53469-21-9	Aroclor-1242 [2C]		7.46	14.9	29.9	U
12672-29-6	Aroclor-1248		7.46	14.9	29.9	U
11097-69-1	Aroclor-1254 [2C]	39.7	7.46	14.9	29.9	
11096-82-5	Aroclor-1260		7.46	14.9	29.9	U
37324-23-5	Aroclor-1262		7.46	14.9	29.9	U
11100-14-4	Aroclor-1268		7.46	14.9	29.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.83	24.51	82.2	70 - 125	
Tetrachloro-m-xylene [2C]	29.83	25.02	83.9	70 - 125	
Decachlorobiphenyl	29.83	23.76	79.7	60 - 125	
Decachlorobiphenyl [2C]	29.83	26.00	87.2	60 - 125	

SAC 10/3/14

ANALYSIS DATA SHEET

VWW06-SD041-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-11	File ID:	074F7401.D
Sampled:	07/30/14 10:35	Prepared:	08/06/14 11:36	Analyzed:	08/12/14 03:01
Solids:	58.44	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H22502	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.4	17.9	53.6	U
12674-11-2	Aroclor-1016		6.71	13.4	26.9	U
11104-28-2	Aroclor-1221		6.71	13.4	26.9	U
11141-16-5	Aroclor-1232		6.71	13.4	26.9	U
53469-21-9	Aroclor-1242		6.71	13.4	26.9	U
12672-29-6	Aroclor-1248		6.71	13.4	26.9	U
11097-69-1	Aroclor-1254		6.71	13.4	26.9	U
11096-82-5	Aroclor-1260		6.71	13.4	26.9	U
37324-23-5	Aroclor-1262		6.71	13.4	26.9	U
11100-14-4	Aroclor-1268		6.71	13.4	26.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.84	20.86	77.7	70 - 125	
Tetrachloro-m-xylene [2C]	26.84	23.16	86.3	70 - 125	
Decachlorobiphenyl	26.84	21.82	81.3	60 - 125	
Decachlorobiphenyl [2C]	26.84	21.96	81.8	60 - 125	

JC 10/31/14

038

ANALYSIS DATA SHEET

VWW06-SD041-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-12	File ID:	075F7501.D
Sampled:	07/30/14 10:40	Prepared:	08/06/14 11:36	Analyzed:	08/12/14 03:14
Solids:	52.88	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H22502	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.5	20.6	61.8	U
12674-11-2	Aroclor-1016		7.74	15.5	31.0	U
11104-28-2	Aroclor-1221		7.74	15.5	31.0	U
11141-16-5	Aroclor-1232		7.74	15.5	31.0	U
53469-21-9	Aroclor-1242		7.74	15.5	31.0	U
12672-29-6	Aroclor-1248		7.74	15.5	31.0	U
11097-69-1	Aroclor-1254		7.74	15.5	31.0	U
11096-82-5	Aroclor-1260		7.74	15.5	31.0	U
37324-23-5	Aroclor-1262		7.74	15.5	31.0	U
11100-14-4	Aroclor-1268		7.74	15.5	31.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.94	20.83	67.3	70 - 125	
Tetrachloro-m-xylene [2C]	30.94	21.85	70.6	70 - 125	
Decachlorobiphenyl	30.94	23.52	76.0	60 - 125	
Decachlorobiphenyl [2C]	30.94	23.58	76.2	60 - 125	

JLC 10/13/14

015

ANALYSIS DATA SHEET

VWW06-SD041-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID: 1408002-13		File ID:	079F7901.D
Sampled:	07/30/14 10:45	Prepared:	08/06/14 11:36	Analyzed:	08/12/14 04:06
Solids:	55.18	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H22502	Calibration:	4209006	Instrument: GL-ECD3

CAS NO	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.9	19.9	59.6	LLT U SSL
12674-11-2	Aroclor-1016		7.47	14.9	29.9	U
11104-28-2	Aroclor-1221		7.47	14.9	29.9	U
11141-16-5	Aroclor-1232		7.47	14.9	29.9	U
53469-21-9	Aroclor-1242		7.47	14.9	29.9	U
12672-29-6	Aroclor-1248		7.47	14.9	29.9	U
11097-69-1	Aroclor-1254		7.47	14.9	29.9	U
11096-82-5	Aroclor-1260		7.47	14.9	29.9	U
37324-23-5	Aroclor-1262		7.47	14.9	29.9	U
11100-14-4	Aroclor-1268		7.47	14.9	29.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.85	19.07	63.9	70 - 125	
Tetrachloro-m-xylene [2C]	29.85	20.26	67.9	70 - 125	
Decachlorobiphenyl	29.85	21.18	70.9	60 - 125	
Decachlorobiphenyl [2C]	29.85	21.50	72.0	60 - 125	

JLC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD042-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-14	File ID:	048F4801.D
Sampled:	07/30/14 12:30	Prepared:	08/06/14 11:36	Analyzed:	08/26/14 23:14
Solids:	42.45	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	43.5	18.7	24.9	74.8	J
12674-11-2	Aroclor-1016		9.37	18.7	37.5	U
11104-28-2	Aroclor-1221		9.37	18.7	37.5	U
11141-16-5	Aroclor-1232		9.37	18.7	37.5	U
53469-21-9	Aroclor-1242 [2C]		9.37	18.7	37.5	U
12672-29-6	Aroclor-1248		9.37	18.7	37.5	U
11097-69-1	Aroclor-1254 [2C]	43.5	9.37	18.7	37.5	
11096-82-5	Aroclor-1260		9.37	18.7	37.5	U
37324-23-5	Aroclor-1262		9.37	18.7	37.5	U
11100-14-4	Aroclor-1268		9.37	18.7	37.5	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	37.46	27.20	72.6	70 - 125	
Tetrachloro-m-xylene [2C]	37.46	27.93	74.6	70 - 125	
Decachlorobiphenyl	37.46	26.56	70.9	60 - 125	
Decachlorobiphenyl [2C]	37.46	29.03	77.5	60 - 125	

JAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD042-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-15	File ID:	083F8301.D
Sampled:	07/30/14 12:35	Prepared:	08/06/14 11:36	Analyzed:	08/12/14 04:58
Solids:	58.03	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence:	4H22502	Calibration:	4209006
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.8	18.4	55.3	U
12674-11-2	Aroclor-1016		6.92	13.8	27.7	U
11104-28-2	Aroclor-1221		6.92	13.8	27.7	U
11141-16-5	Aroclor-1232		6.92	13.8	27.7	U
53469-21-9	Aroclor-1242		6.92	13.8	27.7	U
12672-29-6	Aroclor-1248		6.92	13.8	27.7	U
11097-69-1	Aroclor-1254		6.92	13.8	27.7	U
11096-82-5	Aroclor-1260		6.92	13.8	27.7	U
37324-23-5	Aroclor-1262		6.92	13.8	27.7	U
11100-14-4	Aroclor-1268		6.92	13.8	27.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.67	21.30	77.0	70 - 125	
Tetrachloro-m-xylene [2C]	27.67	22.21	80.2	70 - 125	
Decachlorobiphenyl	27.67	23.07	83.4	60 - 125	
Decachlorobiphenyl [2C]	27.67	22.86	82.6	60 - 125	

JC 10/8/14

ANALYSIS DATA SHEET

VWW06-SD042P-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-16	File ID:	084F8401.D
Sampled:	07/30/14 12:40	Prepared:	08/06/14 11:36	Analyzed:	08/12/14 05:11
Solids:	61.16	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H22502	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.1	17.5	52.4	U
12674-11-2	Aroclor-1016		6.56	13.1	26.3	U
11104-28-2	Aroclor-1221		6.56	13.1	26.3	U
11141-16-5	Aroclor-1232		6.56	13.1	26.3	U
53469-21-9	Aroclor-1242		6.56	13.1	26.3	U
12672-29-6	Aroclor-1248		6.56	13.1	26.3	U
11097-69-1	Aroclor-1254		6.56	13.1	26.3	U
11096-82-5	Aroclor-1260		6.56	13.1	26.3	U
37324-23-5	Aroclor-1262		6.56	13.1	26.3	U
11100-14-4	Aroclor-1268		6.56	13.1	26.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.20	20.70	79.0	70 - 125	
Tetrachloro-m-xylene [2C]	26.20	21.42	81.8	70 - 125	
Decachlorobiphenyl	26.20	23.04	87.9	60 - 125	
Decachlorobiphenyl [2C]	26.20	22.78	86.9	60 - 125	

JLC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD042-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-17	File ID:	085F8501.D
Sampled:	07/30/14 12:45	Prepared:	08/06/14 11:36	Analyzed:	08/12/14 05:24
Solids:	59.69	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04018	Sequence: 4H122502	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.7	18.2	54.6	U
12674-11-2	Aroclor-1016		6.84	13.7	27.4	U
11104-28-2	Aroclor-1221		6.84	13.7	27.4	U
11141-16-5	Aroclor-1232		6.84	13.7	27.4	U
53469-21-9	Aroclor-1242		6.84	13.7	27.4	U
12672-29-6	Aroclor-1248		6.84	13.7	27.4	U
11097-69-1	Aroclor-1254		6.84	13.7	27.4	U
11096-82-5	Aroclor-1260		6.84	13.7	27.4	U
37324-23-5	Aroclor-1262		6.84	13.7	27.4	U
11100-14-4	Aroclor-1268		6.84	13.7	27.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.34	22.67	82.9	70 - 125	
Tetrachloro-m-xylene [2C]	27.34	23.36	85.5	70 - 125	
Decachlorobiphenyl	27.34	24.87	91.0	60 - 125	
Decachlorobiphenyl [2C]	27.34	24.66	90.2	60 - 125	

JAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD042-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-18	File ID:	049F4901.D
Sampled:	07/30/14 12:50	Prepared:	08/06/14 09:39	Analyzed:	08/11/14 21:37
Solids:	52.99	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04020	Sequence:	4H22502	Calibration:	4209006

Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.9	19.9	59.7	U
12674-11-2	Aroclor-1016		7.47	14.9	29.9	U
11104-28-2	Aroclor-1221		7.47	14.9	29.9	U
11141-16-5	Aroclor-1232		7.47	14.9	29.9	U
53469-21-9	Aroclor-1242		7.47	14.9	29.9	U
12672-29-6	Aroclor-1248		7.47	14.9	29.9	U
11097-69-1	Aroclor-1254		7.47	14.9	29.9	U
11096-82-5	Aroclor-1260		7.47	14.9	29.9	U
37324-23-5	Aroclor-1262		7.47	14.9	29.9	U
11100-14-4	Aroclor-1268		7.47	14.9	29.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.86	22.96	76.9	70 - 125	
Tetrachloro-m-xylene [2C]	29.86	24.29	81.4	70 - 125	
Decachlorobiphenyl	29.86	24.69	82.7	60 - 125	
Decachlorobiphenyl [2C]	29.86	25.58	85.7	60 - 125	

JLC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD043-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-19	File ID:	040R4001.D
Sampled:	07/30/14 13:05	Prepared:	08/06/14 09:39	Analyzed:	08/26/14 21:17
Solids:	40.88	Preparation:	EXT 3546	Dilution:	1
Batch:	4H04020	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	50.1	19.7	26.2	78.7	J
12674-11-2	Aroclor-1016 [2C]		59.1	59.1	59.1	G9U
11104-28-2	Aroclor-1221		9.85	19.7	39.5	U
11141-16-5	Aroclor-1232		59.1	59.1	59.1	G9U
53469-21-9	Aroclor-1242	50.1	9.85	19.7	39.5	
12672-29-6	Aroclor-1248		9.85	19.7	39.5	U
11097-69-1	Aroclor-1254		123	123	123	G9U
11096-82-5	Aroclor-1260		9.85	19.7	39.5	U
37324-23-5	Aroclor-1262		9.85	19.7	39.5	U
11100-14-4	Aroclor-1268		9.85	19.7	39.5	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	39.38	31.00	78.7	70 - 125	
Tetrachloro-m-xylene [2C]	39.38	31.25	79.4	70 - 125	
Decachlorobiphenyl	39.38	32.53	82.6	60 - 125	
Decachlorobiphenyl [2C]	39.38	35.46	90.0	60 - 125	

JLC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD043-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-20	File ID:	053F5301.D
Sampled:	07/30/14 13:10	Prepared:	08/06/14 09:39	Analyzed:	08/11/14 22:29
Solids:	61.84	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04020	Sequence: 4H22502	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.1	17.4	52.2	U
12674-11-2	Aroclor-1016		6.54	13.1	26.2	U
11104-28-2	Aroclor-1221		6.54	13.1	26.2	U
11141-16-5	Aroclor-1232		6.54	13.1	26.2	U
53469-21-9	Aroclor-1242		6.54	13.1	26.2	U
12672-29-6	Aroclor-1248		6.54	13.1	26.2	U
11097-69-1	Aroclor-1254		6.54	13.1	26.2	U
11096-82-5	Aroclor-1260		6.54	13.1	26.2	U
37324-23-5	Aroclor-1262		6.54	13.1	26.2	U
11100-14-4	Aroclor-1268		6.54	13.1	26.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.15	25.63	98.0	70 - 125	
Tetrachloro-m-xylene [2C]	26.15	20.09	76.8	70 - 125	
Decachlorobiphenyl	26.15	20.74	79.3	60 - 125	
Decachlorobiphenyl [2C]	26.15	21.34	81.6	60 - 125	

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027

ANALYSIS DATA SHEET

VWW06-SD043-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU16	
Matrix:	Solid	Laboratory ID:	1408002-21	File ID:	054F5401.D
Sampled:	07/30/14 13:15	Prepared:	08/06/14 09:39	Analyzed:	08/11/14 22:42
Solids:	35.95	Preparation:	EXT 3546	Dilution:	1
Batch:	4H04020	Sequence:	4H22502	Calibration:	4209006

Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.5	19.3	57.9	U
12674-11-2	Aroclor-1016		7.25	14.5	29.0	U
11104-28-2	Aroclor-1221		7.25	14.5	29.0	U
11141-16-5	Aroclor-1232		7.25	14.5	29.0	U
53469-21-9	Aroclor-1242		7.25	14.5	29.0	U
12672-29-6	Aroclor-1248		7.25	14.5	29.0	U
11097-69-1	Aroclor-1254		7.25	14.5	29.0	U
11096-82-5	Aroclor-1260		7.25	14.5	29.0	U
37324-23-5	Aroclor-1262		7.25	14.5	29.0	U
11100-14-4	Aroclor-1268		7.25	14.5	29.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	28.96	23.67	81.7	70 - 125	
Tetrachloro-m-xylene [2C]	28.96	23.93	82.6	70 - 125	
Decachlorobiphenyl	28.96	24.76	85.5	60 - 125	
Decachlorobiphenyl [2C]	28.96	25.15	86.9	60 - 125	

JAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD043-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408002-22	File ID:	055F5501.D
Sampled:	07/30/14 13:20	Prepared:	08/06/14 09:39	Analyzed:	08/11/14 22:55
Solids:	55.60	Preparation:	EXT_3546	Dilution:	1
Batch:	4H04020	Sequence:	4H22502	Calibration:	4209006
Instrument:	GC-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.5	19.3	58.0	U
12674-11-2	Aroclor-1016		7.27	14.5	29.1	U
11104-28-2	Aroclor-1221		7.27	14.5	29.1	U
11141-16-5	Aroclor-1232		7.27	14.5	29.1	U
53469-21-9	Aroclor-1242		7.27	14.5	29.1	U
12672-29-6	Aroclor-1248		7.27	14.5	29.1	U
11097-69-1	Aroclor-1254		7.27	14.5	29.1	U
11096-82-5	Aroclor-1260		7.27	14.5	29.1	U
37324-23-5	Aroclor-1262		7.27	14.5	29.1	U
11100-14-4	Aroclor-1268		7.27	14.5	29.1	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.04	21.84	75.2	70 - 125	
Tetrachloro-m-xylene [2C]	29.04	22.72	78.2	70 - 125	
Decachlorobiphenyl	29.04	22.65	78.0	60 - 125	
Decachlorobiphenyl [2C]	29.04	23.01	79.2	60 - 125	

JAC 10/13/14

ANALYSIS DATA SHEET

VWW06-EB01-073114

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Water	Laboratory ID:	1408002-23	File ID:	033F3301.D
Sampled:	07/31/14 06:30	Prepared:	08/04/14 15:17	Analyzed:	08/05/14 00:13
Solids:		Preparation:	EXT_3510	Dilution:	1
Batch:	4H04012	Sequence: 4H21803	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
NA	Total PCBs		0.115	0.240	0.481	UJ U SSL
12674-11-2	Aroclor-1016		0.115	0.240	0.481	U
11104-28-2	Aroclor-1221		0.115	0.240	0.481	U
11141-16-5	Aroclor-1232		0.115	0.240	0.481	U
53469-21-9	Aroclor-1242		0.115	0.240	0.481	U
12672-29-6	Aroclor-1248		0.115	0.240	0.481	U
11097-69-1	Aroclor-1254		0.115	0.240	0.481	U
11096-82-5	Aroclor-1260		0.115	0.240	0.481	U
37324-23-5	Aroclor-1262		0.115	0.240	0.481	U
11100-14-4	Aroclor-1268		0.115	0.240	0.481	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	0.4808	0.1655	34.4	25 - 140	
Tetrachloro-m-xylene [2C]	0.4808	0.1703	35.4	25 - 140	
Decachlorobiphenyl	0.4808	0.1061	22.1	40 - 135	
Decachlorobiphenyl [2C]	0.4808	0.1161	24.2	40 - 135	

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10/3/14

ANALYSIS DATA SHEET

VWW06-SD041-7278 975

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vicques CTO 113 SWMU6	
Matrix:		Laboratory ID:	4H04018-MS1	File ID:	080F8001.D
Sampled:		Prepared:		Analyzed:	08/12/14 04:19
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H04018 Sequence: 4H22502 Calibration: 4209006 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		7.39	14.8	29.6	U
11104-28-2	Aroclor-1221		7.39	14.8	29.6	U
11141-16-5	Aroclor-1232		7.39	14.8	29.6	U
53469-21-9	Aroclor-1242		7.39	14.8	29.6	U
12672-29-6	Aroclor-1248		7.39	14.8	29.6	U
11097-69-1	Aroclor-1254	451.1	7.39	14.8	29.6	
11096-82-5	Aroclor-1260		7.39	14.8	29.6	U
37324-23-5	Aroclor-1262		7.39	14.8	29.6	U
11100-14-4	Aroclor-1268		7.39	14.8	29.6	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	AMOUNT (ug/Kg dry)	CONC. (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.54	23.85	80.7	70 - 125	
Decachlorobiphenyl	29.54	25.12	85.1	60 - 125	

QAC 8/25/14

ANALYSIS DATA SHEET

VWW06-SD041-7278 175

Laboratory:	Empirical Laboratories, LLC		SDG:	1408003	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H04018-MS1	File ID:	080R8001.D
Sampled:		Prepared:		Analyzed:	08/12/14 04:19
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H04018 Sequence: 4H22502 Calibration: 4209006 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		7.39	14.8	29.6	U
11104-28-2	Aroclor-1221 [2C]		7.39	14.8	29.6	U
11141-16-5	Aroclor-1232 [2C]		7.39	14.8	29.6	U
53469-21-9	Aroclor-1242 [2C]		7.39	14.8	29.6	U
12672-29-6	Aroclor-1248 [2C]		7.39	14.8	29.6	U
11097-69-1	Aroclor-1254 [2C]	489.4	7.39	14.8	29.6	
11096-82-5	Aroclor-1260 [2C]		7.39	14.8	29.6	U
37324-23-5	Aroclor-1262 [2C]		7.39	14.8	29.6	U
11100-14-4	Aroclor-1268 [2C]		7.39	14.8	29.6	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	29.54	25.31	85.7	70 - 125	
Decachlorobiphenyl [2C]	29.54	25.52	86.4	60 - 125	

SJC 10/25/14

C32

ANALYSIS DATA SHEET

VWW06-SD041-7278 MSD

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU16	
Matrix:		Laboratory ID:	41104018-MSD1	File ID:	081F8101.D
Sampled:		Prepared:		Analyzed:	08/12/14 04:32
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 41104018 Sequence: 41122502 Calibration: 4200806 Instrument: DL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		7.20	14.4	28.8	U
11104-28-2	Aroclor-1221		7.20	14.4	28.8	U
11141-16-5	Aroclor-1232		7.20	14.4	28.8	U
53469-21-9	Aroclor-1242		7.20	14.4	28.8	U
12672-29-6	Aroclor-1248		7.20	14.4	28.8	U
11097-69-1	Aroclor-1254	395.9	7.20	14.4	28.8	
11096-82-5	Aroclor-1260		7.20	14.4	28.8	U
37324-23-5	Aroclor-1262		7.20	14.4	28.8	U
11100-14-4	Aroclor-1268		7.20	14.4	28.8	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	28.77	21.48	74.7	70 - 125	
Decachlorobiphenyl	28.77	23.49	81.7	60 - 125	

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ANALYSIS DATA SHEET

VWW06-SD041-7278 MSD

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU6	
Matrix:		Laboratory ID:	4104018-MSD1	File ID:	081R8401.D
Sampled:		Prepared:		Analyzed:	08/12/14 04:32
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4104018 Sequence: 4122502 Calibration: 4209006 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		7.20	14.4	28.8	U
11104-28-2	Aroclor-1221 [2C]		7.20	14.4	28.8	U
11141-16-5	Aroclor-1232 [2C]		7.20	14.4	28.8	U
53469-21-9	Aroclor-1242 [2C]		7.20	14.4	28.8	U
12672-29-6	Aroclor-1248 [2C]		7.20	14.4	28.8	U
11097-69-1	Aroclor-1254 [2C]	461.1	7.20	14.4	28.8	
11096-82-5	Aroclor-1260 [2C]		7.20	14.4	28.8	U
37324-23-5	Aroclor-1262 [2C]		7.20	14.4	28.8	U
11100-14-4	Aroclor-1268 [2C]		7.20	14.4	28.8	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	28.77	23.05	80.1	70 - 125	
Decachlorobiphenyl [2C]	28.77	24.91	86.6	60 - 125	

SAC 10/25/14

E34

ANALYSIS DATA SHEET

VWW06-SD043-0006 MS

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H04020-MS1	File ID:	041F4101.D
Sampled:		Prepared:		Analyzed:	08/26/14 21:32
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H04020 Sequence: 4H23912 Calibration 4232001 Instrument GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		9.81	19.6	39.3	U
11104-28-2	Aroclor-1221		9.81	19.6	39.3	U
11141-16-5	Aroclor-1232		9.81	19.6	39.3	U
53469-21-9	Aroclor-1242		9.81	19.6	39.3	U
12672-29-6	Aroclor-1248		9.81	19.6	39.3	U
11097-69-1	Aroclor-1254	744.3	9.81	19.6	39.3	
11096-82-5	Aroclor-1260		9.81	19.6	39.3	U
37324-23-5	Aroclor-1262		9.81	19.6	39.3	U
11100-14-4	Aroclor-1268		9.81	19.6	39.3	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	39.20	29.94	76.4	70 - 125	
Decachlorobiphenyl	39.20	30.04	76.6	60 - 125	

JLC 10-25-14

ANALYSIS DATA SHEET

VWW06-SD043-0006 MB

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR VIeques CTO 113 SWM116	
Matrix:		Laboratory ID:	41104020-MS1	File ID:	041R4101.D
Sampled:		Prepared:		Analyzed:	08/26/14 21:32
Solids:		Preparation:	EXT-3546	Dilution:	

Batch: 41104020 Sequence: 41R23912 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		9.81	19.6	39.3	U
11104-28-2	Aroclor-1221 [2C]		9.81	19.6	39.3	U
11141-16-5	Aroclor-1232 [2C]		9.81	19.6	39.3	U
53469-21-9	Aroclor-1242 [2C]		9.81	19.6	39.3	U
12672-29-6	Aroclor-1248 [2C]		9.81	19.6	39.3	U
11097-69-1	Aroclor-1254 [2C]	892.7	9.81	19.6	39.3	
11096-82-5	Aroclor-1260 [2C]		9.81	19.6	39.3	U
37324-23-5	Aroclor-1262 [2C]		9.81	19.6	39.3	U
11100-14-4	Aroclor-1268 [2C]		9.81	19.6	39.3	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	39.20	29.90	76.3	70 - 125	
Decachlorobiphenyl [2C]	39.20	32.48	82.9	60 - 125	

QAC 10-25-14

ANALYSIS DATA SHEET

VWW06-SD043-0006 MSD

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H04020-MSD1	File ID:	042R4201.D
Sampled:		Prepared:		Analyzed:	08/26/14 21:46
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H04020 Sequence: 4H23912 Calibration: 4232001 Instrument: GL-EC123

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		10.2	20.3	40.7	U
11104-28-2	Aroclor-1221		10.2	20.3	40.7	U
11141-16-5	Aroclor-1232		10.2	20.3	40.7	U
53469-21-9	Aroclor-1242		10.2	20.3	40.7	U
12672-29-6	Aroclor-1248		10.2	20.3	40.7	U
11097-69-1	Aroclor-1254	632.9	10.2	20.3	40.7	
11096-82-5	Aroclor-1260		10.2	20.3	40.7	U
37324-23-5	Aroclor-1262		10.2	20.3	40.7	U
11100-14-4	Aroclor-1268		10.2	20.3	40.7	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	40.66	28.51	70.1	70 - 125	
Decachlorobiphenyl	40.66	30.51	75.0	60 - 125	

JRC 10-25-14

037

ANALYSIS DATA SHEET

VWW06-SD043-0006 MSD

Laboratory:	Empirical Laboratories, LLC		SDG:	1408002	
Client:	CH2M Hill, Inc.		Project:	NTR Viennes CLO 113 SWM116	
Matrix:		Laboratory ID:	4H04020-MSD1	File ID:	042R4201.D
Sampled:		Prepared:		Analyzed:	08/26/14 21:46
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H04020 Sequence: 4H23912 Calibration: 4232001 Instrument: GL-ECD3

CAS NO	COMPOUND	OSC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		10.2	20.3	40.7	U
11104-28-2	Aroclor-1221 [2C]		10.2	20.3	40.7	U
11141-16-5	Aroclor-1232 [2C]		10.2	20.3	40.7	U
53469-21-9	Aroclor-1242 [2C]		10.2	20.3	40.7	U
12672-29-6	Aroclor-1248 [2C]		10.2	20.3	40.7	U
11097-69-1	Aroclor-1254 [2C]	**805.0**	10.2	20.3	40.7	
11096-82-5	Aroclor-1260 [2C]		10.2	20.3	40.7	U
37324-23-5	Aroclor-1262 [2C]		10.2	20.3	40.7	U
11100-14-4	Aroclor-1268 [2C]		10.2	20.3	40.7	U

Total Target Analytes Reported: 18

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	40.66	29.11	71.6	70 - 125	
Decachlorobiphenyl [2C]	40.66	34.55	85.0	60 - 125	

JAC 10-25-14

ANALYSIS DATA SHEET

VWW06-SD055-0006

Laboratory:	Empirical Laboratories, LLC	SDG:	1408002
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408002-01
Sampled:	07/30/14 09:00	Received:	08/01/14 08:45
% Solids:	52.33		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	96.6	0.557	1.11	1.86	1		SW6010C	4H12023	08/21/14 19:24
7440-66-6	Zinc	234	1.86	3.71	7.42	1		SW6010C	4H12023	08/21/14 19:24

SBC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD055-2430

Laboratory:	Empirical Laboratories, LLC	SDG:	1408002
Client:	CH2M Hill, Inc	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408002-02
Sampled:	07/30/14 09:05	Received:	08/01/14 08:45
% Solids:	58.99		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	2.90	0.499	0.997	1.66	1	J FD	SW6010C	4H12023	08/21/14 19:29
7440-66-6	Zinc	6.18	3.32	0.65	13.3	2	J JB FD	SW6010C	4H12023	08/22/14 12:49

JLC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD05SP-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 09:10
% Solids: 54.54

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-03
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.81	0.550	1.10	1.83	1	J+ FD	SW6010C	4H12022	08/21/14 17:01
7440-66-6	Zinc	4.04	3.67	7.33	14.7	1	J+ FD	SW6010C	4H12022	08/22/14 11:19

JAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD055-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 09:15
% Solids: 53.74

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-04
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.55	0.542	1.08	1.51	1	J	SW6010C	4H12072	08/21/14 17:06
7440-66-6	Zinc	5.34	3.61	7.23	14.5	2	JD	SW6010C	4H12072	08/22/14 11:24

QAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD055-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 09:20
% Solids: 54.41

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-05
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.71	0.530	1.06	1.77	1	J	SW6010C	4H12022	08/21/14 17:10
7440-66-6	Zinc	11.5	2.53	7.07	14.1	2	JD	SW6010C	4H12022	08/22/14 11:28

DJC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD040-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 09:45
% Solids: 51.78

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-06
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	79.6	0.557	1.11	1.86	1		SW6010C	4H12022	08/21/14 17:15
7440-66-6	Zinc	112	1.86	3.71	7.43	1		SW6010C	4H12022	08/21/14 17:15

044

ANALYSIS DATA SHEET

VWW06-SD040-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 09:50
% Solids: 56.33

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-07
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.23	0.527	1.05	1.76	1	J	SW6010C	4H12022	08/21/14 17:19
7440-66-6	Zinc	5.74	3.52	7.03	14.1	2	JB	SW6010C	4H12022	08/22/14 11:33

MC 101314

ANALYSIS DATA SHEET

VWW06-SD040-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 09:55
% Solids: 55.80

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-08
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.50	0.549	1.10	1.83	1	J	SW6010C	4H12022	08/21/14 17:24
7440-66-6	Zinc	5.80	3.66	7.31	14.6	2	JD	SW6010C	4H12022	08/22/14 11:37

JDC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD040-7278

Laboratory:	Empirical Laboratories, LLC	SDG:	1408002
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 112 SWMU 6
Matrix:	Solid	Laboratory ID:	1408002-09
Sampled:	07/30/14 10:00	Received:	08/01/14 08:45
% Solids:	53.75		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.76	0.532	1.06	1.77	1	J	SW6010C	4H12022	08/21/14 17:28
7440-66-6	Zinc	11.8	3.54	7.09	14.2	2	JD	SW6010C	4H12022	08/22/14 11:42

JAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD041-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 10:30
% Solids: 54.01

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-10
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	111	0.550	1.10	1.83	1		SW6010C	4H12022	08/21/14 17:33
7440-66-6	Zinc	126	1.83	3.67	7.31	1		SW6010C	4H12022	08/21/14 17:33

JC 8/13/14

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ANALYSIS DATA SHEET

VWW06-SD041-2430

Laboratory:	Empirical Laboratories, LLC	SDG:	1408002
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408002-11
Sampled:	07/30/14 10:35	Received:	08/01/14 08:45
% Solids:	58.44		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.14	0.503	1.01	1.68	1	J	SW6010C	4H12022	08/21/14 17:58
7440-66-6	Zinc	4.21	3.36	6.71	13.4	2	JP	SW6010C	4H12022	08/22/14 11:46

SAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD041-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 10:40
% Solids: 52.88

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-12
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.35	0.540	1.08	1.80	1	J	SW6010C	4H12022	08/21/14 17:42
7440-66-6	Zinc	6.70	3.60	7.20	14.4	2	JB	SW6010C	4H12022	08/22/14 11:51

ANALYSIS DATA SHEET

VWW06-SD041-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 10:45
% Solids: 55.18

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-13
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.19	0.528	1.06	1.76	1	J	SW6010C	4H11025	08/19/14 20:20
7440-66-6	Zinc	11.7	3.52	7.04	14.1	2	JD	SW6010C	4H11025	08/21/14 16:30

JC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD042-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 12:30
% Solids: 42.45

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-14
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	131	0.721	1.44	2.40	1	J DT	SW6010C	4H12022	08/21/14 17:59
7440-66-6	Zinc	187	2.40	3.51	9.61	1	J DT	SW6010C	4H12022	08/21/14 17:59

SBC 10/23/14

ANALYSIS DATA SHEET

VWW06-SD042-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 12:35
% Solids: 58.03

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-15
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.35	0.807	1.01	1.69	1	J	SW6010C	4412022	08/21/14 18:04
7440-66-6	Zinc	5.16	3.38	6.76	12.5	2	JB	SW6010C	4412022	08/22/14 11:56

10/13/14

ANALYSIS DATA SHEET

VWW06-SD042P-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 12:40
% Solids: 51.16

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-16
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.37	0.476	0.952	1.59	1	J	SW6010C	4H12022	08/21/14 18:08
7440-66-6	Zinc	5.03	3.17	6.35	12.7	2	BJ	SW6010C	4H12022	08/22/14 12:00

JK 101814

P54

ANALYSIS DATA SHEET

VWW06-SD042-4854

Laboratory:	Empirical Laboratories, LLC	SDG:	1408002
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408002-17
Sampled:	07/30/14 12:45	Received:	08/01/14 08:45
% Solids:	59.69		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.31	0.488	0.976	1.63	1	J	SW6010C	4H12022	08/21/14 18:13
7440-66-6	Zinc	4.54	3.25	6.51	13.0	2	JB	SW6010C	4H12022	08/22/14 12:17

SAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD042-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 12:50
% Solids: 52.99

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-18
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	3.97	0.544	1.09	1.81	1		SW6010C	4H12022	08/21/14 18:18
7440-66-6	Zinc	14.4	3.63	7.26	14.5	2	JD	SW6010C	4H12022	08/22/14 12:22

JLC 10/31/14

ANALYSIS DATA SHEET

VWW06-SD043-0006

Laboratory:	Empirical Laboratories, LLC	SDG:	1408002
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408002-19
Sampled:	07/30/14 13:05	Received:	08/01/14 08:45
% Solids:	40.88		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	420	0.734	1.47	2.45	1	J DT	SW6010C	4H12022	08/21/14 18:22
7440-66-6	Zinc	548	2.45	4.89	9.79	1	J DT	SW6010C	4H12022	08/21/14 18:22

SAC 10/3/14

ANALYSIS DATA SHEET

VWW06-SD043-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc
Matrix: Solid
Sampled: 07/30/14 13:10
% Solids: 61.84

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-20
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.28	0.485	0.970	1.62	1	J	SW6010C	4H12022	08/21/14 18:27
7440-66-6	Zinc	3.73	3.23	6.47	12.9	2	JD	SW6010C	4H12022	08/22/14 12:27

JC 10/13/14

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ANALYSIS DATA SHEET

VWW06-SD043-4854

Laboratory:	Empirical Laboratories, LLC	SDG:	1408002
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408002-21
Sampled	07/30/14 13:15	Received:	08/01/14 08:45
% Solids:	55.95		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.53	0.526	1.05	1.75	1	J	SW6010C	4H12023	08/21/14 18:31
7440-66-6	Zinc		3.50	7.01	14.0	1	U	SW6010C	4H12023	08/22/14 12:31

JAC
10/13/14

ANALYSIS DATA SHEET

VWW06-SD043-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/30/14 13:20
% Solids: 55.60

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408002-22
Received: 08/01/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.61	0.519	1.04	1.73	1	J	SW6010C	4412022	08/21/14 18:36
7440-66-6	Zinc	7.83	3.46	6.93	13.8	2	J	SW6010C	4412022	08/22/14 12:36

JAR 10/13/14

060

ANALYSIS DATA SHEET

VWW06-EB01-073114

Laboratory:	Empirical Laboratories, LLC	SDG:	1408002
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Water	Laboratory ID:	1408002-23
Sampled:	07/31/14 06:30	Received:	08/01/14 08:45

CAS NO.	Analyte	Conc. (ug/L)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead		1.50	3.00	5.00	1	U	SW6010C	4011011	08/18/14 13:43
7440-66-6	Zinc		5.00	10.0	20.0	1	U	SW6010C	4011011	08/18/14 13:43

JDC
10/31/14

ANALYSIS DATA SHEET

VWW06-SD041-7278

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 35.18

SDG: 1408002

Project: NTR Vicinity CTO 113 SWMU-6

Laboratory ID: 4011025-MS1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	94.17	0.538	1.08	1.79	1		SW6010C	4011025	09/19/14 20:21
7440-66-6	Zinc	223.5	1.79	3.59	9.18	1		SW6010C	4011025	09/19/14 20:24

BJC 10/23/14

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ANALYSIS DATA SHEET

VWW06-SD041-7278

Laboratory: Empirical Laboratories, LLC

Client: CH2M HILL Inc.

Matrix: Solid

% Solids: 55.18

SDG: 1408002

Project: NTR Vicinity CTO 113 SWMU 6

Laboratory ID: 4H11025-MSD1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	94.55	0.538	1.08	1.79	1		SW6010C	4H11025	08/19/14 20:29
7440-66-6	Zinc	223.7	1.79	2.59	5.18	1		SW6010C	4H11025	08/19/14 20:29

JAC
10/25/14

Sample Delivery Group Case Narrative

Receipt Information:

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision:

Revision 01: The package was revised to replace the "matrix spike", "matrix spike duplicate", and "duplicate" on the Analysis Data Sheets with the client ID of the parent sample at the request of the client.

Analytical Information:

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. Sample preparation and dilution information is provided within the final results report and at the beginning of each form set. The following information is provided specific to individual methods:

SW8082B:

Note – Sample 1408002-19 is qualified with a C9 for Aroclor-1016, Aroclor-1232, and Aroclor-1254 to indicate that the DL, LOD, and LOQ were raised due to sample matrix interference.

The following surrogates exceeded criteria:

Tetrachloro-m-xylene with a negative bias on column 1 in 1408002-12 and on both columns in 1408002-13

Decachlorobiphenyl with a negative bias on both columns in 1408002-23

Note – The samples were not re-extracted since 2 or more surrogates were within criteria.

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

SW6010C:

The following post spikes exceeded criteria:

4H11025-PS1 (1408002-13) with a positive bias for Zinc; note – the associated batch spike and

64

matrix spikes are within criteria

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

1408002

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 • Nashville, TN 37228 • 877-345-1113 • (fax) 866-417-0548

23279

Send Results to:	Send Invoice to:	Analysis Requirements:	Lab Use Only:
Name Juliana Dean	Name SAME	Metals 6010C, PCB 8082A	VOA Headspace Y N NA
Company CH2M Hill	Company		Field Filtered Y N NA
Address 5701 Cleveland St. Suite 200	Address		Correct Containers Y N NA
City Virginia Beach	City		Discrepancies Y N NA
State, Zip Virginia 23462	State, Zip		Cust. Seals Intact Y N NA
Phone 757 671 6232	Phone		Containers Intact Y N NA
Fax	Fax		Airbill #
E-mail juliana.dean@ch2m.com	E-mail		CAR #
Project No./Name:	Sampler's (Signature):		

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Comments	No. of Bottles	Lab Use Only Containers/Pres.
01	7/30/14 0900	VWW06-SD055-0006	SD		2	
02	7/30/14 0905	VWW06-SD055-2430	SD		2	
03	7/30/14 0910	VWW06-SD055P-2430	SD		2	
04	7/30/14 0915	VWW06-SD055-4854	SD		2	
05	7/30/14 0920	VWW06-SD055-7278	SD		2	
06	7/30/14 0945	VWW06-SD040-0006	SD		2	
07	7/30/14 0950	VWW06-SD040-2430	SD		2	
08	7/30/14 0955	VWW06-SD040-4854	SD		2	
09	7/30/14 1000	VWW06-SD040-7278	SD		2	
10	7/30/14 1030	VWW06-SD041-0006	SD		2	
11	7/30/14 1035	VWW06-SD041-2430	SD		2	
12	7/30/14 1040	VWW06-SD041-4854	SD		2	

Relinquished by: (Signature)	Date/Time	Received By: (Signature)	REMARKS:	Details
[signature]	0700 7/31/14			Page ___ of ___
Relinquished by: (Signature)	Date/Time	Received By: (Signature)		Cooler No. ___ of ___
				Date Shipped ___
Received for Laboratory by: (Signature)	Date/Time	Temperature		Shipped By ___
[signature]	0845 8/1/14	-0.5		Turnaround ___

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

1408002

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 ♦ Nashville, TN 37228 ♦ 877-345-1113 ♦ (fax) 866-417-0548

23280

Send Results to:
Name Juliana Dean
Company CH2M Hill
Address 5701 Cleveland St Suite 200
City Virginia Beach
State, Zip VA 23462
Phone 757 671 6232
Fax
E-mail juliana.dean@ch2m.com

Send Invoice to:
Name SAME
Company
Address
City
State, Zip
Phone
Fax
E-mail

Project No./Name:

Sampler's (Signature):

Analysis Requirements: Metals 6010C; PCB 8082A

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres.
13	7/30/14 1045	VWW06-SD041-7278	SD	✓	✓		2	
~~	~~7/30/14 1045~~	~~VWW06-SD041-7278~~	~~SD~~	~~✓~~	~~✓~~		~~2~~	
13	7/30/14 1045	VWW06-SD041-7278-MS	SD	✓	✓		2	
~~	~~7/30/14 1045~~	~~VWW06-SD041-7278-MS~~	~~SD~~	~~✓~~	~~✓~~		~~2~~	
13	7/30/14 1045	VWW06-SD041-7278-SD	SD	✓	✓		2	
~~	~~7/30/14 1045~~	~~VWW06-SD041-7278-SD~~	~~SD~~	~~✓~~	~~✓~~		~~2~~	
14	7/30/14 1230	VWW06-SD042-0006	SD	✓	✓		2	
15	7/30/14 1235	VWW06-SD042-2430	SD	✓	✓		2	
16	7/30/14 1240	VWW06-SD042P-2430	SD	✓	✓		2	
17	7/30/14 1245	VWW06-SD042-4854	SD	✓	✓		2	
18	7/30/14 1250	VWW06-SD042-7278	SD	✓	✓		2	
19	7/30/14 1305	VWW06-SD043-0006	SD	✓	✓		2	

Relinquished by: (Signature)	Date/Time: 0700 7/31/14	Received By (Signature)
Relinquished by: (Signature)	Date/Time	Received By (Signature)
Received for Laboratory by: (Signature)	Date/Time: 0845 8/1/14	Temperature: -0.5

REMARKS:

Details:
Page ____ of ____
Cooler No. ____ of ____
Date Shipped
Shipped By
Turnaround

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

1408002

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 • Nashville, TN 37228 • 877-345-1113 • (fax) 866-417-0548

23281

Send Results to:
Name Juliana Dean
Company CH2M Hill
Address 5700 Cleveland St Suite 300
City Virginia Beach
State, Zip Virginia
Phone 757 671 6232
Fax
E-mail juliana.dean@ch2m.com

Project No./Name:

Send Invoice to:
Name SAME
Company
Address
City
State, Zip
Phone
Fax
E-mail

Sampler's (Signature):

Analysis Requirements:

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres.
20	7/30/14 1310	VWW06-SD043-2436	SD	✓	✓		2	
21	7/30/14 1315	VWW06-SD043-4854	SD	✓	✓		2	
22	7/30/14 1320	VWW06-SD043-7278	SD	✓	✓		2	
23	7/31/14 0630	VWW06-EB01-073114	AQ	✓	✓		3	

Relinquished by: (Signature)	Date/Time: 0700 7/31/14	Received By: (Signature)
Relinquished by: (Signature)	Date/Time:	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time: 0845 8/1/14	Temperature: -0.5

REMARKS:

Details:
Page ____ of ____
Cooler No ____ of ____
Date Shipped ____
Shipped By ____
Turnaround ____

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 08/01/14 0845 Workorder# 1408002

1. Tracking # 5522 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: -0.2 °C + correction factor (-0.3) = -0.5 °C

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES (NO) NA

4. Were custody seals on outside of cooler? (YES) NO NA

   If yes, how many and where: 2 front + back

5. Were the seals intact, signed, and dated correctly? (YES) NO NA

6. Were custody papers inside cooler? (YES) NO NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) JTL 08/01/14

7. Were custody seals on containers: YES (NO) and intact YES NO (NA)

   Were these signed and dated correctly? YES NO (NA)

8. Packing material used? (Bubblewrap) (Plastic bag) Peanuts Vermiculite Foam insert Paper Other None

9. Cooling process: (Ice) Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES) NO NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES) NO NA

12. Did all container labels and tags agree with custody papers? (YES) NO NA

13. a. Were VOA vials received? YES (NO) NA

    b. Was there any observable headspace present in any VOA vial? YES NO (NA)

14. Was there a Trip Blank in this cooler? YES (NO) NA If multiple coolers, sequence # —

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) JTL 8/1/14

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? (YES) NO (NA) JTL 8/1/14

    b. Did the bottle labels indicate that the correct preservatives were used (YES) NO NA

16. Was residual chlorine present? YES NO (NA)

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) JTL 8/1/14

17. Were custody papers properly filled out (ink, signed, etc)? YES (NO) NA ☆

18. Did you sign the custody papers in the appropriate place? (YES) NO NA

19. Were correct containers used for the analysis requested? (YES) NO NA

20. Was sufficient amount of sample sent in each container? (YES) NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial/date) JTL 8/1/14

I certify that I attached a label with the unique LIMS number to each container (initial/date) JTL 8/1/14

I certify that I have performed a second check of the LIMS information against the COC to confirm accuracy (initial/date)

21. Were there Non-Conformance issues at login? YES (NO) Was a NCR generated? YES (NO) #

Additional Details: Field sampler did indicate on page one of CoC parameters requested. Client PM indicated 'metals + PCB' were to be logged for samples on page one of CoC.

Joshua Gross

From: Sonya Gordon [sgordon@empirlabs.com]
Sent: Friday, August 01, 2014 9:03 AM
To: jgross@empirlabs.com
Subject: FW: SWMU 6

today's shipment from Vieques... 1st page, log in all samples for pcb & metals

Sonya Gordon
Project Manager
Empirical Laboratories, LLC
Main: 615.345.1115 ext. 238 | Fax: 866.417.0548

Your opinion is valuable to us. Please click here to provide us your feedback.

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From: Juliana.Dean@ch2m.com [mailto:Juliana.Dean@ch2m.com]
Sent: Friday, August 01, 2014 8:24 AM
To: sgordon@empirlabs.com
Subject: SWMU 6

Hi Sonya,

See attached for today's COC. Note that all samples should be analyzed for PCBs and metals, even though nothing is marked on the first page of the COC. Also, sample VWW06-SD055-7278 was collected at 9:20 (it looks like 8:20 on my copy). I'll take a look at the login you sent and let you know if we need any updates.

Thank you!

Juliana Dean

CH2M HILL
Project Chemist
5701 Cleveland St, Suite 200
Virginia Beach, VA 23462
757-671-6232

Holding Times

Sampling Date: 7/30
Received Date: 8/11/14
Extraction Date: 8/4, 8/6 – PCBs
Analysis Dates: 8/5, 8/11-8/12, 8/26 – PCBs

The samples in this SDG were validated according to the recommendations in the Region II SOP NO. HW-37 Rev 3, 5/2013 and the QC limits published in the project specific SAP.

Receipt paperwork was in order. Cooler temperatures were acceptable. A seven-day holding time was used for the water samples and a fourteen-day holding time was used for the soil samples. The analysis holding time of 40 days was used. Based on this, all extraction and analysis holding times were met.

All samples exhibited percent solids values >30% so no qualifications were required.

Calibrations

8082 PCB: Initial calibrations were performed according to the method with a six-point curve for AR1016, AR1242, AR1254, & AR1260 as the representative PCBs. Response factors were calculated. %RSDs were within QC limits. All ICV criteria were met (avg. %Ds were met). Continuing calibration standards were analyzed appropriately (for 1016, 1242 & 1260). All CCVs exhibited acceptable %Ds (avg. %Ds were met). Column resolution was acceptable. Standard retention times were stable throughout the analytical sequences. The correct analytical sequences were run. Raw data and calculations were verified.

Blank Summary

Blank qualification guidelines:

- No action is taken if a compound is found in the blank but not in the sample.
- Any compound detected in the sample, and the associated blank, must be qualified by reporting the result in the sample as non-detect at the LOD when the sample concentration is less than LOD.
- Sample weight, volume or dilution factor must be taken into consideration when applying the qualification criteria.
- Apply the same data validation guidelines to any associated rinse and field blanks and all associated samples.
- Qualification/Action codes:
  - No Action - The sample result is greater than the LOD and greater than five times (5X) the blank value.
  - U at LOD- The sample result is less than the LOD when the blank contamination level is less than the LOD.

Professional judgment is applied when blank concentrations are >LOD. Results may be flagged as U at the reported concentration or rejected. No contamination that resulted in qualification of the data was noted in the associated method or instrument blanks or the submitted field QC blanks.

Blank ID	Compound	Concentration	Action Level	Q Flag
no contamination was noted				

Surrogate Recoveries

Surrogate recoveries did not meet criteria in two of the samples in this SDG. Samples VWW06-EB01-073114 and VWW06-SD041-7278 are qualified as estimated J-/UJ due to low surrogate recoveries.

Matrix Spike/Matrix Spike Duplicates

The MS/MSD sample analyzed for this SDG were acceptable for all recoveries and RPDs in the original runs. No qualifications were required.

Laboratory Control Samples

The LCS samples exhibited acceptable recoveries and RPDs. No qualifications were required.

Field Duplicate Sample Summary

There were two field duplicate pairs in this SDG. No qualifications were necessary in either of the field duplicate pairs. See the worksheet following this page for details.

Sample Result Verification

Reported sample results were verified. Raw data and calculations were verified. One reported positive results exhibited a column quantitation %D that was >40%. The result was qualified as estimated J.

Reviewer: Jacqueline Cleveland Date: 10/21/14

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD055-2430
Duplicate Sample ID: VWW06-SD055P-2430

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: no positive results reported in either sample.

Sample ID: VWW06-SD042-2430
Duplicate Sample ID: VWW06-SD042P-2430

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: no positive results reported in either sample.

Initial Calibration Date: 7/24-25-14, Instrument GL-ECD3

RRF and %RSD Calculations:

Compound Name: Cal3 at 750/75, Std. 14G0434, AR1660 peak 2 in level 3
Lab Value: 2054.3000

Area of Compound	1540725
Conc. of Compound	750
Calculated CF	2054.300

Compound Name: AR1260 Peak 2
Lab Value: 6.4

CF of STD 1	1883.529
CF of STD 2	1962.644
CF of STD 3	2054.300
CF of STD 4	2133.612
CF of STD 5	2036.520
CF of STD 6	2259.440
CF of STD 7	
CF of STD 8	
Calculated % RSD	6.39

Continuing Calibration File ID: 8/11/14, @ 2058, FILE id 046f4601.d

RRF and %D Calculations:

Compound Name: AR1260, peak 1
Lab Value: 4389.0440

Area of Compound	4389044
Conc. of Compound	1000
Calculated CF	4389.044

Compound Name: AR1260, peak 1
Lab Value: 2.0

Average CF	4303.434
CF of CCV	4389.044
Calculated % D	-2.0

SAMPLE CALCULATION - SDG 1408002

Sample ID: VWW06-SD055-0006
Standard ID: ICAL 7/24-25/14
Compound: AR1260
Concentration: 22.1 ug/Kg (average of at least 3 peaks)
Calculation shows Peak 1: 12.026 ug/Kg

	Water (ug/L)	Soil (ug/Kg)
Area of Compound		36697
CF of Compound		1857.154
Final Volume		5
Dilution Factor		1
Split Factor		1
Injection Volume		1
Weight of Sample	na	15.7
Initial Volume of Sample		NA
Conversion Factor		1
Percent Solids Factor		0.5233
Concentration	#DIV/0!	12.02548

Peak #	Concentration
1	12.0256
2	26.309
3	40.647
4	
5	9.567
Total	**22.13715**

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408002
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H21803	Instrument:	GL-ECD3
		Calibration:	4209006

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (4H21803-CCV1) ug/L				Lab File ID: 003F0301.D		Analyzed: 08/04/14 17:40		
Tetrachloro-m-xylene	100.0	98.0	80 - 120	2.494	2.494	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	95.8	80 - 120	2.962	2.962	0.0000	+/-0.030	
Decachlorobiphenyl	100.0	97.6	80 - 120	7.299	7.299	0.0000	+/-0.030	
Decachlorobiphenyl [2C]	100.0	97.1	80 - 120	8.109	8.109	0.0000	+/-0.030	
Calibration Check (4H21803-CCV6) ug/L				Lab File ID: 016F1601.D		Analyzed: 08/04/14 20:29		
Tetrachloro-m-xylene	100.0	97.7	80 - 120	2.491	2.494	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	94.5	80 - 120	2.961	2.962	-0.0010	+/-0.030	
Decachlorobiphenyl	100.0	88.6	80 - 120	7.295	7.299	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	100.0	88.0	80 - 120	8.105	8.109	-0.0040	+/-0.030	
Blank (4H04012-BLK1) ug/L				Lab File ID: 022F2201.D		Analyzed: 08/04/14 21:47		
Tetrachloro-m-xylene	0.5000	75.5	25 - 140	2.49	2.494	-0.0040	+/-0.030	
Tetrachloro-m-xylene [2C]	0.5000	76.0	25 - 140	2.96	2.962	-0.0020	+/-0.030	
Decachlorobiphenyl	0.5000	75.3	40 - 135	7.294	7.299	-0.0050	+/-0.030	
Decachlorobiphenyl [2C]	0.5000	77.0	40 - 135	8.105	8.109	-0.0040	+/-0.030	
LCS (4H04012-BS3) ug/L				Lab File ID: 027F2701.D		Analyzed: 08/04/14 22:53		
Tetrachloro-m-xylene	0.5000	62.1	25 - 140	2.493	2.494	-0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	0.5000	63.7	25 - 140	2.962	2.962	0.0000	+/-0.030	
Decachlorobiphenyl	0.5000	57.3	40 - 135	7.296	7.299	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	0.5000	59.6	40 - 135	8.107	8.109	-0.0020	+/-0.030	
LCS Dup (4H04012-BSD3) ug/L				Lab File ID: 028F2801.D		Analyzed: 08/04/14 23:07		
Tetrachloro-m-xylene	0.5000	66.7	25 - 140	2.493	2.494	-0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	0.5000	68.4	25 - 140	2.961	2.962	-0.0010	+/-0.030	
Decachlorobiphenyl	0.5000	63.6	40 - 135	7.296	7.299	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	0.5000	65.7	40 - 135	8.106	8.109	-0.0030	+/-0.030	
VWW06-EB01-073114 (1408002-23) ug/L				Lab File ID: 033F3301.D		Analyzed: 08/05/14 00:13		
Tetrachloro-m-xylene	0.4808	34.4	25 - 140	2.492	2.494	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	0.4808	35.4	25 - 140	2.961	2.962	-0.0010	+/-0.030	
Decachlorobiphenyl	0.4808	22.1	40 - 135	7.295	7.299	-0.0040	+/-0.030	*
Decachlorobiphenyl [2C]	0.4808	24.2	40 - 135	8.106	8.109	-0.0030	+/-0.030	*
Calibration Check (4H21803-CCVC) ug/L				Lab File ID: 035F3501.D		Analyzed: 08/05/14 00:40		
Tetrachloro-m-xylene	100.0	97.7	80 - 120	2.492	2.494	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	95.9	80 - 120	2.96	2.962	-0.0020	+/-0.030	
Decachlorobiphenyl	100.0	88.6	80 - 120	7.295	7.299	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	100.0	89.2	80 - 120	8.105	8.109	-0.0040	+/-0.030	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408002
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H22502	Instrument:	GL-ECD3
		Calibration:	4209006

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
VWW06-SD041-4854 (1408002-12) ug/Kg dry				Lab File ID: 075F7501.D		Analyzed: 08/12/14 03:14		
Tetrachloro-m-xylene	30.94	67.3	70 - 125	2.403	2.404	-0.0010	+/-0.030	*
Tetrachloro-m-xylene [2C]	30.94	70.6	70 - 125	2.861	2.862	-0.0010	+/-0.030	
Decachlorobiphenyl	30.94	76.0	60 - 125	7.156	7.159	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	30.94	76.2	60 - 125	7.933	7.934	-0.0010	+/-0.030	
VWW06-SD041-7278 (1408002-13) ug/Kg dry				Lab File ID: 079F7901.D		Analyzed: 08/12/14 04:06		
Tetrachloro-m-xylene	29.85	63.9	70 - 125	2.403	2.404	-0.0010	+/-0.030	*
Tetrachloro-m-xylene [2C]	29.85	67.9	70 - 125	2.862	2.862	0.0000	+/-0.030	*
Decachlorobiphenyl	29.85	70.9	60 - 125	7.155	7.159	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	29.85	72.0	60 - 125	7.933	7.934	-0.0010	+/-0.030	
Matrix Spike (4H04018-MS1) ug/Kg dry				Lab File ID: 080F8001.D		Analyzed: 08/12/14 04:19		
Tetrachloro-m-xylene	29.54	80.7	70 - 125	2.403	2.404	-0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	29.54	85.7	70 - 125	2.86	2.862	-0.0020	+/-0.030	
Decachlorobiphenyl	29.54	85.1	60 - 125	7.157	7.159	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	29.54	86.4	60 - 125	7.934	7.934	0.0000	+/-0.030	
Matrix Spike Dup (4H04018-MSD1) ug/Kg dry				Lab File ID: 081F8101.D		Analyzed: 08/12/14 04:32		
Tetrachloro-m-xylene	28.77	74.7	70 - 125	2.403	2.404	-0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	28.77	80.1	70 - 125	2.86	2.862	-0.0020	+/-0.030	
Decachlorobiphenyl	28.77	81.7	60 - 125	7.156	7.159	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	28.77	86.6	60 - 125	7.931	7.934	-0.0030	+/-0.030	
VWW06-SD042-2430 (1408002-15) ug/Kg dry				Lab File ID: 083F8301.D		Analyzed: 08/12/14 04:58		
Tetrachloro-m-xylene	27.67	77.0	70 - 125	2.403	2.404	-0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	27.67	80.2	70 - 125	2.861	2.862	-0.0010	+/-0.030	
Decachlorobiphenyl	27.67	83.4	60 - 125	7.158	7.159	-0.0010	+/-0.030	
Decachlorobiphenyl [2C]	27.67	82.6	60 - 125	7.933	7.934	-0.0010	+/-0.030	
VWW06-SD042P-2430 (1408002-16) ug/Kg dry				Lab File ID: 084F8401.D		Analyzed: 08/12/14 05:11		
Tetrachloro-m-xylene	26.20	79.0	70 - 125	2.403	2.404	-0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	26.20	81.8	70 - 125	2.861	2.862	-0.0010	+/-0.030	
Decachlorobiphenyl	26.20	87.9	60 - 125	7.156	7.159	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	26.20	86.9	60 - 125	7.933	7.934	-0.0010	+/-0.030	
VWW06-SD042-4854 (1408002-17) ug/Kg dry				Lab File ID: 085F8501.D		Analyzed: 08/12/14 05:24		
Tetrachloro-m-xylene	27.34	82.9	70 - 125	2.402	2.404	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	27.34	85.5	70 - 125	2.861	2.862	-0.0010	+/-0.030	
Decachlorobiphenyl	27.34	91.0	60 - 125	7.156	7.159	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	27.34	90.2	60 - 125	7.933	7.934	-0.0010	+/-0.030	

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

VWW06-SD055-0006

Lab Name: Empirical Laboratories, LLC

Lab Sample ID: 1408002-01 Date(s) Analyzed: 08/26/2014 08/26/2014

Instrument ID (1): GL-ECD3 Instrument ID (2): GL-ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	4.92	4.84	4.90	30.0	
	2	5.66	6.14	6.20	54.6	58
Aroclor-1260	1	7.00	7.30	7.36	20.9	
	2	6.82	7.17	7.23	22.1	6

J

This SDG contains 22 solid matrix samples and 1QC blank samples analyzed for select metals using SW-846 methods 6010C. Region II validation guidelines were applied (updated 12/20/12) and these worksheets are submitted along with marked up pages from the data package and annotated form 1s and EDD files.

HOLDING TIMES

Sampling Date: 7/30
Received Date: 8/1/14
Prep. Dates: 8/11, 8/13
Analysis Dates: 8/18-8/22

All preparation & analysis holding time requirements were met. Cooler temps were acceptable and receipt paperwork was in order. Two samples exhibited %solids values <50%. All results in samples VWW06-SD042-0006 (42.45%) & VWW06-SD043-0006 (40.88) are flagged as estimated J/UJ.

CALIBRATIONS

All initial calibration criteria were met for the methods noted above. All ICV, CCV and low calibration standard criteria were met or associated samples were reanalyzed against acceptable QC standards. PQL standard criteria were met. ICSA/ICSAB results were within method criteria for all analytes. Raw data was verified.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- See blank type specific validation guidelines noted below (taken from the Region II SOP for CLP metals and adapted to this project).
- Qualification/Action codes:

Note: non-detect results are reported to the LOD so the LOD is the RL for this project.

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the reporting limit, when the ICB/CCB/PB result is less than the RL.
R -	Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
J/UJ -	Sample result is less than 10X RL when blank result is below the negative RL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.
Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL when the field blank result is greater than the RL - result is reported as non-detect at the reporting limit.
R -	Sample result is greater than the RL and less than the field blank value when the field blank result is greater than the RL.
J -	Sample result is greater than the field blank value but less than 10X the field blank value when field blank result is greater than the RL.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	Action Level	Q Flag
no contamination was noted in the associated blanks				

See validation report for specific samples and qualifications. Only those analytes requiring action are listed here. Negative contamination in a prep blank or CCB, if less than the analyte CRDL, is qualified based on professional judgment. Field QC blank associations are determined using tracking provided by the client. Flags are applied to samples based on these associations. The concentration noted for the CCBs is the highest concentration in all the associated

CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for CCB contamination.

MATRIX SPIKE/DUPLICATE SUMMARY

Qualifications were made based on the 12/12 revision of the Region II guidance SOPs which flags only the native sample for spike and spike dup recovery and RPD issues. The submitted PDS spikes were also considered in the evaluation of the spike data.

The MS/MSD pair of samples VWW06-SD041-7278 exhibited acceptable recoveries and RPDs. All associated LCS recoveries were acceptable also. The PDS was out at 123%. No qualifications were required.

SERIAL DILUTIONS

The laboratory submitted acceptable serial dilution analyses. No qualifications were required.

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments. Dilutions were performed. The raw data and calculations were verified. Field duplicates were assessed – see the following page for results and qualifications if needed.

Reviewer _____ **Date:** 5/21/01

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD055-2430
Duplicate Sample ID: VWW06-SD055P-2430

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD	
lead	2.9	1.81	46	*
zinc	6.18	4.04	42	*

COMMENTS: Flag both analytes as estimated J in the field duplicate pair.
*30% RPD limit for all analytes >5X LOD - results in both samples flagged J

Sample ID: VWW06-SD042-2430
Duplicate Sample ID: VWW06-SD042P-2430

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	1.35	1.37	1
zinc	5.16	5.03	3

COMMENTS: No qualifications were required.
*30% RPD limit for all analytes >5X LOD - results in both samples flagged J

CH2MHILL VIEQUES SWMU6 CTO-113

SDG 1408002

Reporting Limit Calcs

ICP - AES	
SAMPLE ID	VWW06-SD055-7278
ANALYTE	zinc
Form 1 LOD or LOQ Value (mg/Kg)	7.07
Analyte LOD or LOQ	2
SAMPLE SIZE (g)	1.04
DILUTION FACTOR	2
DRYNESS FACTOR	0.5441
Corrected LOD or LOQ (mg/Kg)	7.069

CH2M HILL VIEQUES CTO-113

SDG 1408002

METALS CALCULATIONS

ICP - AES	
SAMPLE ID	VWW06-SD040-4854
ANALYTE	lead
Lab Value CONCENTRATION (ug/Kg)	1.5
AMOUNT FROM RAW DATA (ug/L)	4.1034
SAMPLE SIZE (g)	0.98
FINAL VOLUME (L)	0.2
DILUTION FACTOR	1
DRYNESS FACTOR	0.558
CONVERSION FACTOR (g TO Kg)	1
CALCULATED CONCENTRATION (ug/Kg)	1.50

POST DIGEST SPIKE SAMPLE RECOVERY

SW6010C

VWW06-SD041-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Batch: 4H11025
Preparation: MET 3050B

SDG: 1408002
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 4H11025-PS1
Lab Source ID: 1408002-13
Initial/Final: 1.03 g / 200 mL

Analyte	Spike Sample Result (SSR) (ug/L)	Sample Result (SR) (ug/L)	Spike Added (SA) (ug/L)	%R	Control Limit %R
Lead	267.2	3.381	250.0	106	80 - 120
Zinc	**650.2**	**35.98**	**500.0**	**-123**	**80 - 120**

NQ

MS/MSD %R & RPDs were OK

DataQual

Environmental Services, LLC

CH2M HILL-VBO
5701 Cleveland Street
Suite 200
Virginia Beach, VA 23462

October 28, 2014
SDG# 1408016; Empirical Laboratories, LLC
Vieques CTO-113, SWMU6 – Naval Training Range

Dear Ms. Dean,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1408016. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, professional judgment, and the guidance offered in the region II SOPs HW-2a Revision 15, December 2012, for ICP-AES data validation and HW-37 Revision 3, May 2013, for PCB data validation. The DoD Quality Systems Manual for Environmental Laboratories Version 4.2 and the project specific SAP were also consulted. Worksheets tabulating the validation process including calculation verifications are included in the support documentation section of this report. All areas of concern are discussed in the body of the report and a summary of data qualifications are provided.

Sample ID	Lab ID	Matrix	PCB	Pb, Zn
VWW06-SD044-0006	1408016-01	soil	X	X
VWW06-SD044-2430	1408016-02	soil	X	X
VWW06-SD044-2430MS	1408016-02MS	soil	X	X
VWW06-SD044-2430MSD	1408016-02MSD	soil	X	X
VWW06-SD044-4854	1408016-03	soil	X	X
VWW06-SD044-7278	1408016-04	soil	X	X
VWW06-SD045-0006	1408016-05	soil	X	X
VWW06-SD045-2430	1408016-06	soil	X	X
VWW06-SD045-4854	1408016-07	soil	X	X
VWW06-SD045-7278	1408016-08	soil	X	X
VWW06-SD039-0006	1408016-09	soil	X	X
VWW06-SD039-2430	1408016-10	soil	X	X
VWW06-SD039-4854	1408016-11	soil	X	X
VWW06-SD039-7278	1408016-12	soil	X	X
VWW06-SD038-0006	1408016-13	soil	X	X
VWW06-SD038-2430	1408016-14	soil	X	X
VWW06-SD038-4854	1408016-15	soil	X	X
VWW06-SD038-7278	1408016-16	soil	X	X
VWW06-SD037-0006	1408016-17	soil	X	X
VWW06-SD037-2430	1408016-18	soil	X	X
VWW06-SD037-2430MS	1408016-18MS	soil	X	X
VWW06-SD037-2430MSD	1408016-18MSD	soil	X	X
VWW06-SD037-4854	1408016-19	soil	X	X
VWW06-SD037-7278	1408016-20	soil	X	X
VWW06-SD037P-7278	1408016-21	soil	X	X
VWW06-EB01-080114	1408016-22	water	X	X

Sample ID	Lab ID	Matrix	PCB	Pb, Zn
VWW06-SD036-0006	1408016-23	soil	X	X
VWW06-SD036-2430	1408016-24	soil	X	X
VWW06-SD036-2430MS	1408016-24MS	soil	X	X
VWW06-SD036-2430MSD	1408016-24MSD	soil	X	X
VWW06-SD036-4854	1408016-25	soil	X	X
VWW06-SD036-7278	1408016-26	soil	X	X
VWW06-SD035-0006	1408016-27	soil	X	X
VWW06-SD035P-0006	1408016-28	soil	X	X
VWW06-SD035-2430	1408016-29	soil	X	X
VWW06-SD035-4854	1408016-30	soil	X	X
VWW06-SD035-7278	1408016-31	soil	X	X
VWW06-SD034-0006	1408016-32	soil	X	X
VWW06-SD034-2430	1408016-33	soil	X	X
VWW06-SD034-4854	1408016-34	soil	X	X
VWW06-SD034-7278	1408016-35	soil	X	X
VWW06-EB01-080414	1408016-36	water	X	X

The following quality control samples were provided with this SDG: sample VWW06-SD037P-7278-field duplicate of sample VWW06-SD037-7278; sample VWW06-SD035P-0006-field duplicate of sample VWW06-SD035-0006; and rinse blank samples VWW06-EB01-080114 and VWW06-EB01-080414.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition
- Technical Holding Times
- Initial/Continuing Calibrations *
- ICSA/ICSAB Standards *
- Low Level Standards *
- Blanks *
- Surrogate Recoveries
- Laboratory Control Samples *
- Matrix Spike Recoveries *
- Matrix Duplicate RPDs *
- Serial Dilutions *
- Field Duplicates
- Identification/Quantitation
- Reporting Limits *

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were

no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. *If an issue is not addressed in this narrative there were no actions required based on unmet quality control criteria.*

PCBs

No critical findings resulting in data rejections were noted. Some major findings resulting in qualification of data as estimated were noted. The majority of the data is reported without qualification.

One sample exhibited high (>70%) moisture content (based on Region II requirements). All reported results in these samples were qualified as estimated J/UJ.

Two samples required qualification based on exceeded holding times.

Qualifications were required based on non-compliant surrogate recoveries.

Several samples were re-extracted outside of the holding time. All but two of these samples were excluded in favor of the results reported in the original analyses.

One of the field duplicate pairs exhibited RPDs greater than the 30% RPD criteria from the project specific SAP and qualifications were required.

One reported positive result exhibited a column quantitation %D greater than the 40% RPD criteria from the project specific SAP and qualifications were required.

Select Metals Pb & Zn

Several samples exhibited high (>50%) moisture content (based on Region II requirements). All reported results in these samples were qualified as estimated J/UJ.

One of the field duplicate pairs exhibited RPDs greater than the 30% RPD criteria from the project specific SAP and qualifications were required.

Specific Evaluation of Data

Data Completeness

The SDG was received complete and intact. Updated MS/MSD results forms that included the client sample ID were requested and received from the laboratory.

Technical Holding Times

According to chain of custody records, sampling was performed on 7/31/14, 8/1/14, & 8/4/14 and samples were received at the laboratory 8/5/14. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the following exception.

PCBs

Several samples were re-extracted due to non-compliant surrogate recoveries or sulfur interference. Samples VWW06-SD045-4854 RE1, VWW06-SD039-0006 RE2, VWW06-SD038-2430 RE1, VWW06-SD038-7278 RE1, VWW06-SD035P-006 RE1, and VWW06-SD034-0006 RE1, which were re-extracted 13-15 days outside the holding time, are excluded in favor of the results reported from the analyses reported from the initial extractions.

One sample was reported 1 day outside the extraction holding time of 7 days from sampling. The results reported in sample VWW06-EB01-080114 are qualified as estimated J/UJ.

Samples VWW06-SD037-0006 RE1 and VWW06-SD038-0006 RE1 are excluded in favor of the results reported in the RE2 extractions of the samples. These samples are not outside of the holding times but the RE2 results are significantly different. Samples VWW06-SD038-0006 RE2 and VWW06-SD037-0006 RE2 are qualified as estimated J/UJ based on exceeded holding times. These samples are reported rather than the original analyses because the surrogate recoveries are acceptable and AR1254 is reported in the extracts. The original extracts exhibited very low surrogate recoveries and no positive results for AR1254. It is the professional opinion of the validator that the original extract results (RE1) may reflect false non-detect results for AR1254.

Sample Condition

PCBs

All samples exhibited solids content >30% except sample VWW06-SD045-0006 which exhibited a %solids value of 27.1%. Results in this sample were qualified as estimated J/UJ as required based on the Region II requirements.

Select Metals, Pb & Zn

Several samples exhibited high moisture content (%solids < 50%) as noted in the following table. All reported results were qualified as estimated J/UJ based on the Region II guidance.

Sample ID	%Solids	Q Flag	Q Code
VWW06-SD045-0006	27.10	J/UJ	OT
VWW06-SD039-0006	48.07		
VWW06-SD038-0006	48.59		
VWW06-SD037-0006	43.31		
VWW06-SD036-0006	48.33		
VWW06-SD035-0006	41.61		
VWW06-SD035P-0006	39.71		
VWW06-SD034-0006	32.79		

Surrogate Recoveries

PCBs

Several samples exhibited non-compliant recoveries as noted in the following table. Results required qualifications as noted.

Sample ID	Surrogate	%R	QC Limits	Q Flag	Q Code
VWW06-EB01-080114	DCB	33.5/36.1	40-135	J/UJ	SSL
VWW06-SD035-4854	TCMX	64.0/69.1	70-125		
VWW06-SD044-4854	DCB	52.4/53.8	60-125		
VWW06-SD045-4854	TCMX DCB	67.0/69.4 43.4/44.6	70-125 60-125		
VWW06-SD035-0006	TCMX	69.6/69.4	70-125		
VWW06-SD035P-0006	TCMX DCB	60.3/61.7 53.9/57.8	70-125 60-125		
VWW06-SD034-0006	TCMX DCB	47.4/48.6 44.8/48.5	70-125 60-125		
VWW06-SD034-4854	TCMX	60.2/65.3	70-125		
VWW06-SD034-7278	TCMX	63.6/68.8	70-125		
VWW06-SD039-4854	DCB	48.6/49.6	60-125		
VWW06-SD038-2430	TCMX DCB	69.9 49.6/51.4	70-125 60-125		
VWW06-SD038-4854	DCB	46.1/47.1	60-125		
VWW06-SD038-7278	TCMX DCB	63.2/62.4 34.4/35.5	70-125 60-125		
VWW06-SD039-0006RE1	TCMX DCB	53.1/55.7 30.4/33.1	70-125 60-125		

Field Duplicates

PCBs

The field duplicate pair of samples VWW06-SD035-0006 & VWW06-SD035P-0006 exhibited a high RPD (> 30%) for AR1254 and total Aroclors. The reported results are qualified as estimated J with a qualifier code of FD.

Select Metals, Pb & Zn

The field duplicate pair of samples VWW06-SD035-0006 & VWW06-SD035P-0006 exhibited a high RPD (> 30%) for lead (33%) and zinc (51%). The reported results are qualified as estimated J with a qualifier code of FD.

Compound Identification/Quantitation

PCBs

One positive result exhibited a positive result for AR1254 with a column quantitation %D >40% (based on the SAP requirement) at 49%. The result reported for AR1254 in sample VWW06-SD035P-0006 is qualified as estimated J with a qualifier code of 2C

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Jacqueline Cleveland

Jacqueline Cleveland
Vice President

Summary of Data Qualifications

PCBs

Sample ID	Compounds	Results	Q Flag	Q Code
VWW06-SD045-4854 RE1, VWW06-SD039-0006 RE2, VWW06-SD038-2430 RE1, VWW06-SD038-7278 RE1, VWW06-SD035P-006 RE1, VWW06-SD034-0006 RE1, VWW06-SD037-0006 RE1, VWW06-SD038-0006 RE1	all compounds	+/-	exclude	RE
VWW06-SD038-0006 RE2, VWW06-SD037-0006 RE2, VWW06-EB01-080114*	all compounds	+/-	J/UJ	HT
VWW06-SD045-0006	all compounds	+/-	J/UJ	OT
VWW06-EB01-080114, VWW06-SD035-4854, VWW06-SD044-4854, VWW06-SD045-4854, VWW06-SD035-0006, VWW06-SD035P-0006, VWW06-SD034-0006, VWW06-SD034-4854, VWW06-SD034-7278, VWW06-SD039-4854, VWW06-SD038-2430, VWW06-SD038-4854, VWW06-SD038-7278, VWW06-SD039-0006RE1	all compounds	+/-	J/UJ	SSL
VWW06-SD035-0006 *, VWW06-SD035P-0006*	AR1254 Total PCBs	+	J	FD
VWW06-SD035P-0006*	AR1254	+P	J	2C

*Each of these samples was qualified for surrogate recoveries as a final qualifier with a qualifier code SSL.

Select Metals – Pb & Zn

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-SD045-0006, VWW06-SD039-0006, VWW06-SD038-0006, VWW06-SD037-0006, VWW06-SD036-0006, VWW06-SD035-0006, VWW06-SD035P-0006, VWW06-SD034-0006	all analytes	+/-	J/UJ	OT
VWW06-SD035-0006*, VWW06-SD035P-0006*	lead zinc	+	J	FD

*Each of these samples is flagged as estimated due to high moisture content rather than field duplicate non-compliance.

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
J+	estimated biased high
J-	estimated biased low
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the LOD (2X sample LOD for common laboratory contaminants) when the blank value is less than the LOD. The sample result for the blank contaminant is not qualified with any blank qualifiers.
LOD	The sample result for the blank contaminant is less than the LOD (2X sample LOD for common laboratory contaminants) but greater than the MDL when the blank value is less than the LOD. The sample result for the blank contaminant is changed to the LOD and qualified as non-detect U.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the ICB/CCB/PB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the LOD.
J+ -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the LOD.
J/UJ -	Sample result is less than 10X LOD when blank result is below the negative LOD.

Glossary of Qualification Flags and Abbreviations, continued

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.

Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD when the FB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the FB value when the FB value is greater than the LOD.
J+ -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the LOD.

General Abbreviations

MDL	method detection limit
IDL	instrument detection limit
LOD/RL	Level of Detection//Reporting Limit
LOQ	Level of Quantitation
+	positive result
-	non-detect result

ANALYSIS DATA SHEET

VWW06-SD044-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-01RE1	File ID:	022F2201.D
Sampled:	07/31/14 08:35	Prepared:	08/08/14 13:36	Analyzed:	08/25/14 18:52
Solids:	51.97	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence: 4H24102	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.7	20.9	62.7	U
12674-11-2	Aroclor-1016 [2C]		7.85	15.7	31.4	U
11104-28-2	Aroclor-1221		7.85	15.7	31.4	U
11141-16-5	Aroclor-1232		7.85	15.7	31.4	U
53469-21-9	Aroclor-1242		7.85	15.7	31.4	U
12672-29-6	Aroclor-1248		7.85	15.7	31.4	U
11097-69-1	Aroclor-1254 [2C]		7.85	15.7	31.4	U
11096-82-5	Aroclor-1260		7.85	15.7	31.4	U
37324-23-5	Aroclor-1262		7.85	15.7	31.4	U
11100-14-4	Aroclor-1268		7.85	15.7	31.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.38	26.58	84.7	70 - 125	
Tetrachloro-m-xylene [2C]	31.38	27.60	88.0	70 - 125	
Decachlorobiphenyl	31.38	23.62	75.3	60 - 125	
Decachlorobiphenyl [2C]	31.38	24.90	79.3	60 - 125	

SAC 10/14/14

ANALYSIS DATA SHEET

YWW06-SD044-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-02RE1	File ID:	023F2301.D
Sampled:	07/31/14 08:40	Prepared:	08/08/14 13:36	Analyzed:	08/25/14 19:07
Solids:	64.11	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence: 4H24102	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		12.7	16.9	50.6	U
12674-11-2	Aroclor-1016		6.34	12.7	25.4	U
11104-28-2	Aroclor-1221		6.34	12.7	25.4	U
11141-16-5	Aroclor-1232		6.34	12.7	25.4	U
53469-21-9	Aroclor-1242		6.34	12.7	25.4	U
12672-29-6	Aroclor-1248		6.34	12.7	25.4	U
11097-69-1	Aroclor-1254		6.34	12.7	25.4	U
11096-82-5	Aroclor-1260		6.34	12.7	25.4	U
37324-23-5	Aroclor-1262		6.34	12.7	25.4	U
11100-14-4	Aroclor-1268		6.34	12.7	25.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	25.34	20.38	80.4	70 - 125	
Tetrachloro-m-xylene [2C]	25.34	21.30	84.1	70 - 125	
Decachlorobiphenyl	25.34	19.80	78.2	60 - 125	
Decachlorobiphenyl [2C]	25.34	20.66	81.5	60 - 125	

JC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD044-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-03	File ID:	057F5701.D
Sampled:	07/31/14 08:45	Prepared:	08/08/14 13:36	Analyzed:	08/21/14 01:12
Solids:	50.93	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence: 4H23711	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.4	20.5	61.5	U U SSL
12674-11-2	Aroclor-1016		7.70	15.4	30.8	U
11104-28-2	Aroclor-1221		7.70	15.4	30.8	U
11141-16-5	Aroclor-1232		7.70	15.4	30.8	U
53469-21-9	Aroclor-1242		7.70	15.4	30.8	U
12672-29-6	Aroclor-1248		7.70	15.4	30.8	U
11097-69-1	Aroclor-1254		7.70	15.4	30.8	U
11096-82-5	Aroclor-1260		7.70	15.4	30.8	U
37324-23-5	Aroclor-1262		7.70	15.4	30.8	U
11100-14-4	Aroclor-1268		7.70	15.4	30.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.76	22.53	73.2	70 - 125	
Tetrachloro-m-xylene [2C]	30.76	22.48	73.1	70 - 125	
Decachlorobiphenyl	30.76	16.11	52.4	60 - 125	*Y*
Decachlorobiphenyl [2C]	30.76	16.54	53.8	60 - 125	*Y*

DAC 10/14/14

012

ANALYSIS DATA SHEET

VWW06-SD044-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-04	File ID:	058F5801.D
Sampled:	07/31/14 08:50	Prepared:	08/08/14 13:36	Analyzed:	08/21/14 01:27
Solids:	57.24	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence:	4H23711	Calibration:	4232001

Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.8	18.3	55.0	U
12674-11-2	Aroclor-1016		6.89	13.8	27.6	U
11104-28-2	Aroclor-1221		6.89	13.8	27.6	U
11141-16-5	Aroclor-1232		6.89	13.8	27.6	U
53469-21-9	Aroclor-1242		6.89	13.8	27.6	U
12672-29-6	Aroclor-1248		6.89	13.8	27.6	U
11097-69-1	Aroclor-1254		6.89	13.8	27.6	U
11096-82-5	Aroclor-1260		6.89	13.8	27.6	U
37324-23-5	Aroclor-1262		6.89	13.8	27.6	U
11100-14-4	Aroclor-1268		6.89	13.8	27.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.52	21.12	76.7	70 - 125	
Tetrachloro-m-xylene [2C]	27.52	21.02	76.4	70 - 125	
Decachlorobiphenyl	27.52	19.22	69.8	60 - 125	X
Decachlorobiphenyl [2C]	27.52	19.53	71.0	60 - 125	X

ANALYSIS DATA SHEET

VWW06-SD045-0006

Laboratory	Empirical Laboratories, LLC		SDG	1408016	
Client	CH2M Hill, Inc.		Project	NTR Vieques CTO 113 SWM016	
Matrix	Solid	Laboratory ID	1408016-05RE1	File ID	026F2601.D
Sampled	07/31/14 09:25	Prepared	08/08/14 13:26	Analyzed	08/25/14 19:51
Solids	27.10	Preparation	EXT 3546	Dilution	1
Batch	4H07025	Sequence	4H24102	Calibration	4232001	Instrument	GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		30.3	40.4	121	UJ
12674-11-2	Aroclor-1016 [2C]		15.2	30.3	60.8	U
11104-28-2	Aroclor-1221		15.2	30.3	60.8	U
11141-16-5	Aroclor-1232		15.2	30.3	60.8	U
53469-21-9	Aroclor-1242 [2C]		15.2	30.3	60.8	U
12672-29-6	Aroclor-1248		15.2	30.3	60.8	U
11097-69-1	Aroclor-1254 [2C]		15.2	30.3	60.8	U
11096-82-5	Aroclor-1260		15.2	30.3	60.8	U
37324-23-5	Aroclor-1262		15.2	30.3	60.8	U
11100-14-4	Aroclor-1268		15.2	30.3	60.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	60.70	48.26	79.5	70 - 125	
Tetrachloro-m-xylene [2C]	60.70	50.14	82.6	70 - 125	
Decachlorobiphenyl	60.70	40.10	66.1	60 - 125	
Decachlorobiphenyl [2C]	60.70	42.79	70.5	60 - 125	

11/14 corrected page

ANALYSIS DATA SHEET

VWW06-SD045-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-06RE1	File ID:	027F2701.D
Sampled:	07/31/14 09:30	Prepared:	08/08/14 13:36	Analyzed:	08/25/14 20:05
Solids:	70.87	Preparation:	EXT 3546	Dilution:	1
Batch:	4H07025	Sequence: 4H24102	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.3	15.1	45.3	U
12674-11-2	Aroclor-1016		5.67	11.3	22.7	U
11104-28-2	Aroclor-1221		5.67	11.3	22.7	U
11141-16-5	Aroclor-1232		5.67	11.3	22.7	U
53469-21-9	Aroclor-1242		5.67	11.3	22.7	U
12672-29-6	Aroclor-1248		5.67	11.3	22.7	U
11097-69-1	Aroclor-1254		5.67	11.3	22.7	U
11096-82-5	Aroclor-1260		5.67	11.3	22.7	U
37324-23-5	Aroclor-1262		5.67	11.3	22.7	U
11100-14-4	Aroclor-1268		5.67	11.3	22.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	22.67	17.57	77.5	70 - 125	
Tetrachloro-m-xylene [2C]	22.67	18.37	81.0	70 - 125	
Decachlorobiphenyl	22.67	14.78	65.2	60 - 125	
Decachlorobiphenyl [2C]	22.67	15.39	67.9	60 - 125	

JC 10/14/14

015

ANALYSIS DATA SHEET

VWW06-SD045-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-07	File ID:	061F6101.D
Sampled:	07/31/14 09:35	Prepared:	08/08/14 13:36	Analyzed:	08/21/14 02:11
Solids:	56.20	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence: 4H23711	Calibration:	4232001	Instrument: GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.8	19.7	59.2	UJ 55U
12674-11-2	Aroclor-1016		7.41	14.8	29.7	U
11104-28-2	Aroclor-1221		7.41	14.8	29.7	U
11141-16-5	Aroclor-1232		7.41	14.8	29.7	U
53469-21-9	Aroclor-1242		7.41	14.8	29.7	U
12672-29-6	Aroclor-1248		7.41	14.8	29.7	U
11097-69-1	Aroclor-1254		7.41	14.8	29.7	U
11096-82-5	Aroclor-1260		7.41	14.8	29.7	U
37324-23-5	Aroclor-1262		7.41	14.8	29.7	U
11100-14-4	Aroclor-1268		7.41	14.8	29.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.62	19.83	67.0	70 - 125	
Tetrachloro-m-xylene [2C]	29.62	20.56	69.4	70 - 125	
Decachlorobiphenyl	29.62	12.84	43.4	60 - 125	
Decachlorobiphenyl [2C]	29.62	13.20	44.6	60 - 125	

JC 10/14/14

016

ANALYSIS DATA SHEET

VWW06-SD045-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-07RE1	File ID:	079F7901.D
Sampled:	07/31/14 09:35	Prepared:	08/27/14 14:00	Analyzed:	08/29/14 09:07
Solids:	56.20	Preparation:	EXT_3546	Dilution:	1
Batch:	4H26005	Sequence:	4124623	Calibration:	4232001

Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.3	19.0	57.1	H2U
12674-11-2	Aroclor-1016		7.15	14.3	28.6	H2U
11104-28-2	Aroclor-1221		7.15	14.3	28.6	H2U
11141-16-5	Aroclor-1232		7.15	14.3	28.6	H2U
53469-21-9	Aroclor-1242		7.15	14.3	28.6	H2U
12672-29-6	Aroclor-1248		7.15	14.3	28.6	H2U
11097-69-1	Aroclor-1254		7.15	14.3	28.6	H2U
11096-82-5	Aroclor-1260		7.15	14.3	28.6	H2U
37324-23-5	Aroclor-1262		7.15	14.3	28.6	H2U
11100-14-4	Aroclor-1268		7.15	14.3	28.6	H2U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	28.57	16.53	57.9	70 - 125	*H2
Tetrachloro-m-xylene [2C]	28.57	17.93	62.8	70 - 125	*H2
Decachlorobiphenyl	28.57	8.781	30.7	60 - 125	*H2
Decachlorobiphenyl [2C]	28.57	9.686	33.9	60 - 125	*H2

ANALYSIS DATA SHEET

VWW06-SD045-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-08	File ID:	062F6201.D
Sampled:	07/31/14 09:40	Prepared:	08/08/14 13:36	Analyzed:	08/21/14 02:25
Solids:	60.01	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence:	4H23711	Calibration:	4232001
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.4	17.8	53.5	U
12674-11-2	Aroclor-1016		6.70	13.4	26.8	U
11104-28-2	Aroclor-1221		6.70	13.4	26.8	U
11141-16-5	Aroclor-1232		6.70	13.4	26.8	U
53469-21-9	Aroclor-1242		6.70	13.4	26.8	U
12672-29-6	Aroclor-1248		6.70	13.4	26.8	U
11097-69-1	Aroclor-1254		6.70	13.4	26.8	U
11096-82-5	Aroclor-1260		6.70	13.4	26.8	U
37324-23-5	Aroclor-1262		6.70	13.4	26.8	U
11100-14-4	Aroclor-1268		6.70	13.4	26.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.79	20.23	75.5	70 - 125	
Tetrachloro-m-xylene [2C]	26.79	20.10	75.0	70 - 125	
Decachlorobiphenyl	26.79	16.87	63.0	60 - 125	Y
Decachlorobiphenyl [2C]	26.79	17.33	64.7	60 - 125	Y

CAC 10/14/14

018

ANALYSIS DATA SHEET

VWW06-SD039-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-09RE1	File ID:	028F2801.D
Sampled:	07/31/14 10:00	Prepared:	08/08/14 13:36	Analyzed:	08/25/14 20:20
Solids:	48.07	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence: 4H24102	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		16.6	22.1	66.4	UT U SSL
12674-11-2	Aroclor-1016		8.32	16.6	33.3	U
11104-28-2	Aroclor-1221		8.32	16.6	33.3	U
11141-16-5	Aroclor-1232		8.32	16.6	33.3	U
53469-21-9	Aroclor-1242		8.32	16.6	33.3	U
12672-29-6	Aroclor-1248		8.32	16.6	33.3	U
11097-69-1	Aroclor-1254		8.32	16.6	33.3	U
11096-82-5	Aroclor-1260		8.32	16.6	33.3	U
37324-23-5	Aroclor-1262		8.32	16.6	33.3	U
11100-14-4	Aroclor-1268		8.32	16.6	33.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	33.25	17.67	53.1	70 - 125	
Tetrachloro-m-xylene [2C]	33.25	18.53	55.7	70 - 125	
Decachlorobiphenyl	33.25	10.09	30.4	60 - 125	
Decachlorobiphenyl [2C]	33.25	11.00	33.1	60 - 125	

BAC 9/04/14

ANALYSIS DATA SHEET

VWW06-SD039-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-09RE2	File ID:	057F5701.D
Sampled:	07/31/14 10:00	Prepared:	08/29/14 12:17	Analyzed:	09/05/14 02:44
Solids:	48.07	Preparation:	EXT_3546	Dilution:	1
Batch:	41129007	Sequence: 4125101	Calibration:	4232001	Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		17.0	22.7	68.1	H2U RE
12674-11-2	Aroclor-1016		8.53	17.0	34.1	H2U
11104-28-2	Aroclor-1221		8.53	17.0	34.1	H2U
11141-16-5	Aroclor-1232		8.53	17.0	34.1	H2U
53469-21-9	Aroclor-1242 [2C]		8.53	17.0	34.1	H2U
12672-29-6	Aroclor-1248		8.53	17.0	34.1	H2U
11097-69-1	Aroclor-1254 [2C]		8.53	17.0	34.1	H2U
11096-82-5	Aroclor-1260		8.53	17.0	34.1	H2U
37324-23-5	Aroclor-1262		8.53	17.0	34.1	H2U
11100-14-4	Aroclor-1268		8.53	17.0	34.1	H2U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	34.08	32.28	94.7	70 - 125	H2
Tetrachloro-m-xylene [2C]	34.08	31.98	93.9	70 - 125	H2
Decachlorobiphenyl	34.08	29.09	85.4	60 - 125	H2
Decachlorobiphenyl [2C]	34.08	32.26	94.7	60 - 125	H2

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ANALYSIS DATA SHEET

VWW06-SD039-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-10RE1	File ID:	029F2901.D
Sampled:	07/31/14 10:05	Prepared:	08/08/14 13:36	Analyzed:	08/25/14 20:35
Solids:	59.99	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence:	4H24102	Calibration:	4232001

Instrument: GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.5	18.0	54.1	U
12674-11-2	Aroclor-1016		6.77	13.5	27.1	U
11104-28-2	Aroclor-1221		6.77	13.5	27.1	U
11141-16-5	Aroclor-1232		6.77	13.5	27.1	U
53469-21-9	Aroclor-1242		6.77	13.5	27.1	U
12672-29-6	Aroclor-1248		6.77	13.5	27.1	U
11097-69-1	Aroclor-1254		6.77	13.5	27.1	U
11096-82-5	Aroclor-1260		6.77	13.5	27.1	U
37324-23-5	Aroclor-1262		6.77	13.5	27.1	U
11100-14-4	Aroclor-1268		6.77	13.5	27.1	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.06	18.73	69.2	70 - 125	*
Tetrachloro-m-xylene [2C]	27.06	19.58	72.3	70 - 125	
Decachlorobiphenyl	27.06	16.94	62.6	60 - 125	
Decachlorobiphenyl [2C]	27.06	17.90	66.2	60 - 125	

JAC
10/14/14

ANALYSIS DATA SHEET

VWW06-SD039-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-11	File ID:	068F6801.D
Sampled:	07/31/14 10:10	Prepared:	08/08/14 13:36	Analyzed:	08/21/14 03:53
Solids:	51.62	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence:	4H23711	Calibration:	4232001	Instrument:	GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.2	20.3	60.9	U U SJC
12674-11-2	Aroclor-1016		7.63	15.2	30.6	U
11104-28-2	Aroclor-1221		7.63	15.2	30.6	U
11141-16-5	Aroclor-1232		7.63	15.2	30.6	U
53469-21-9	Aroclor-1242		7.63	15.2	30.6	U
12672-29-6	Aroclor-1248		7.63	15.2	30.6	U
11097-69-1	Aroclor-1254		7.63	15.2	30.6	U
11096-82-5	Aroclor-1260		7.63	15.2	30.6	U
37324-23-5	Aroclor-1262		7.63	15.2	30.6	U
11100-14-4	Aroclor-1268		7.63	15.2	30.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.50	22.61	74.1	70 - 125	
Tetrachloro-m-xylene [2C]	30.50	22.35	73.3	70 - 125	
Decachlorobiphenyl	30.50	14.81	48.6	60 - 125	*
Decachlorobiphenyl [2C]	30.50	15.14	49.6	60 - 125	*

SJC 10/14/14

022

ANALYSIS DATA SHEET

VWW06-SD039-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-12	File ID:	069F6901.D
Sampled:	07/31/14 10:15	Prepared:	08/08/14 13:36	Analyzed:	08/21/14 04:07
Solids:	58.22	Preparation:	EXT 3546	Dilution:	1
Batch:	4H07025	Sequence:	4H23711	Calibration:	4232001
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.8	18.4	55.1	U
12674-11-2	Aroclor-1016		6.90	13.8	27.7	U
11104-28-2	Aroclor-1221		6.90	13.8	27.7	U
11141-16-5	Aroclor-1232		6.90	13.8	27.7	U
53469-21-9	Aroclor-1242		6.90	13.8	27.7	U
12672-29-6	Aroclor-1248		6.90	13.8	27.7	U
11097-69-1	Aroclor-1254		6.90	13.8	27.7	U
11096-82-5	Aroclor-1260		6.90	13.8	27.7	U
37324-23-5	Aroclor-1262		6.90	13.8	27.7	U
11100-14-4	Aroclor-1268		6.90	13.8	27.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.60	21.39	77.5	70 - 125	
Tetrachloro-m-xylene [2C]	27.60	21.48	77.8	70 - 125	
Decachlorobiphenyl	27.60	18.84	68.3	60 - 125	
Decachlorobiphenyl [2C]	27.60	19.34	70.1	60 - 125	

QC
10/14/14

ANALYSIS DATA SHEET

VWW06-SD038-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-13RE1	File ID:	030F3001.D
Sampled:	07/31/14 10:50	Prepared:	08/08/14 13:36	Analyzed:	08/25/14 20:49
Solids:	48.59	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence: 4H24102	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		16.6	22.1	66.3	exclude U RE
12674-11-2	Aroclor-1016		8.31	16.6	33.3	U
11104-28-2	Aroclor-1221		8.31	16.6	33.3	U
11141-16-5	Aroclor-1232		8.31	16.6	33.3	U
53469-21-9	Aroclor-1242 [2C]		8.31	16.6	33.3	U
12672-29-6	Aroclor-1248		8.31	16.6	33.3	U
11097-69-1	Aroclor-1254 [2C]		8.31	16.6	33.3	U
11096-82-5	Aroclor-1260		8.31	16.6	33.3	U
37324-23-5	Aroclor-1262		8.31	16.6	33.3	U
11100-14-4	Aroclor-1268		8.31	16.6	33.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	33.20	19.99	60.2	70 - 125	
Tetrachloro-m-xylene [2C]	33.20	21.00	63.3	70 - 125	
Decachlorobiphenyl	33.20	14.49	43.7	60 - 125	
Decachlorobiphenyl [2C]	33.20	15.57	46.9	60 - 125	

SAC 10/14/14

024

ANALYSIS DATA SHEET

VWW06-SD038-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-13RE2	File ID:	058R5801.D
Sampled:	07/31/14 10:50	Prepared:	08/29/14 12:17	Analyzed:	09/05/14 02:59
Solids:	48.59	Preparation:	EXT_3546	Dilution:	1
Batch:	4H29007	Sequence: 4I25I01	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	82.9	16.2	21.6	64.8	J H2 HT
12674-11-2	Aroclor-1016		8.12	16.2	32.5	UJ H2U
11104-28-2	Aroclor-1221		8.12	16.2	32.5	H2U
11141-16-5	Aroclor-1232		8.12	16.2	32.5	H2U
53469-21-9	Aroclor-1242 [2C]		8.12	16.2	32.5	H2U
12672-29-6	Aroclor-1248		8.12	16.2	32.5	H2U
11097-69-1	Aroclor-1254	82.9	8.12	16.2	32.5	J H2
11096-82-5	Aroclor-1260		8.12	16.2	32.5	UJ H2U
37324-23-5	Aroclor-1262		8.12	16.2	32.5	H2U
11100-14-4	Aroclor-1268		8.12	16.2	32.5	H2U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	32.44	31.11	95.9	70 - 125	H2
Tetrachloro-m-xylene [2C]	32.44	30.90	95.2	70 - 125	H2
Decachlorobiphenyl	32.44	27.30	84.1	60 - 125	H2
Decachlorobiphenyl [2C]	32.44	30.62	94.4	60 - 125	H2

JAC
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ANALYSIS DATA SHEET

VWW06-SD038-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-14	File ID:	071R7101.D
Sampled:	07/31/14 10:55	Prepared:	08/08/14 13:36	Analyzed:	08/21/14 04:36
Solids:	61.66	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence:	4H27711	Calibration:	4232001
Instrument:	GC-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		12.9	17.2	51.6	UT U SSL
12674-11-2	Aroclor-1016		6.47	12.9	25.9	U
11104-28-2	Aroclor-1221		6.47	12.9	25.9	U
11141-16-5	Aroclor-1232		6.47	12.9	25.9	U
53469-21-9	Aroclor-1242		6.47	12.9	25.9	U
12672-29-6	Aroclor-1248		6.47	12.9	25.9	U
11097-69-1	Aroclor-1254		6.47	12.9	25.9	U
11096-82-5	Aroclor-1260		6.47	12.9	25.9	U
37324-23-5	Aroclor-1262		6.47	12.9	25.9	U
11100-14-4	Aroclor-1268		6.47	12.9	25.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	25.84	18.05	69.9	70 - 125	
Tetrachloro-m-xylene [2C]	25.84	18.19	70.4	70 - 125	
Decachlorobiphenyl	25.84	12.83	49.6	60 - 125	
Decachlorobiphenyl [2C]	25.84	13.29	51.4	60 - 125	

SAC 10/14/14

026

ANALYSIS DATA SHEET

VWW06-SD038-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-14RE1	File ID:	080F8001.D
Sampled:	07/31/14 10:55	Prepared:	08/27/14 14:00	Analyzed:	08/29/14 09:22
Solids:	61.66	Preparation:	EXT_3546	Dilution:	1
Batch:	4H26005	Sequence: 4124623	Calibration:	4232001	Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.3	17.8	53.3	H2U
12674-11-2	Aroclor-1016		6.68	13.3	26.7	H2U
11104-28-2	Aroclor-1221		6.68	13.3	26.7	H2U
11141-16-5	Aroclor-1232		6.68	13.3	26.7	H2U
53469-21-9	Aroclor-1242		6.68	13.3	26.7	H2U
12672-29-6	Aroclor-1248		6.68	13.3	26.7	H2U
11097-69-1	Aroclor-1254		6.68	13.3	26.7	H2U
11096-82-5	Aroclor-1260		6.68	13.3	26.7	H2U
37324-23-5	Aroclor-1262		6.68	13.3	26.7	H2U
11100-14-4	Aroclor-1268		6.68	13.3	26.7	H2U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.69	18.88	70.7	70 - 125	H2
Tetrachloro-m-xylene [2C]	26.69	19.62	73.5	70 - 125	H2
Decachlorobiphenyl	26.69	9.325	34.9	60 - 125	*H2
Decachlorobiphenyl [2C]	26.69	10.24	38.4	60 - 125	*H2

JC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD038-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-15	File ID:	072F7201.D
Sampled:	07/31/14 11:00	Prepared:	08/08/14 13:36	Analyzed:	08/21/14 04:51
Solids:	52.53	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence: 4H23711	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.4	20.6	61.7	U
12674-11-2	Aroclor-1016		7.73	15.4	30.9	U
11104-28-2	Aroclor-1221		7.73	15.4	30.9	U
11141-16-5	Aroclor-1232		7.73	15.4	30.9	U
53469-21-9	Aroclor-1242		7.73	15.4	30.9	U
12672-29-6	Aroclor-1248		7.73	15.4	30.9	U
11097-69-1	Aroclor-1254		7.73	15.4	30.9	U
11096-82-5	Aroclor-1260		7.73	15.4	30.9	U
37324-23-5	Aroclor-1262		7.73	15.4	30.9	U
11100-14-4	Aroclor-1268		7.73	15.4	30.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.88	22.76	73.7	70 - 125	
Tetrachloro-m-xylene [2C]	30.88	22.48	72.8	70 - 125	
Decachlorobiphenyl	30.88	14.24	46.1	60 - 125	
Decachlorobiphenyl [2C]	30.88	14.54	47.1	60 - 125	

028

ANALYSIS DATA SHEET

VWW06-SD038-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-16	File ID:	073F7301.D
Sampled:	07/31/14 11:05	Prepared:	08/08/14 13:36	Analyzed:	08/21/14 05:06
Solids:	51.74	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence: 4H23711	Calibration:	4232001	Instrument: GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.7	21.0	62.9	U SSL
12674-11-2	Aroclor-1016		7.88	15.7	31.5	U
11104-28-2	Aroclor-1221		7.88	15.7	31.5	U
11141-16-5	Aroclor-1232		7.88	15.7	31.5	U
53469-21-9	Aroclor-1242		7.88	15.7	31.5	U
12672-29-6	Aroclor-1248		7.88	15.7	31.5	U
11097-69-1	Aroclor-1254		7.88	15.7	31.5	U
11096-82-5	Aroclor-1260		7.88	15.7	31.5	U
37324-23-5	Aroclor-1262		7.88	15.7	31.5	U
11100-14-4	Aroclor-1268		7.88	15.7	31.5	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.48	19.90	63.2	70 - 125	
Tetrachloro-m-xylene [2C]	31.48	19.65	62.4	70 - 125	
Decachlorobiphenyl	31.48	10.84	34.4	60 - 125	
Decachlorobiphenyl [2C]	31.48	11.17	35.5	60 - 125	

SAC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD038-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-16RE1	File ID:	083E3301.D
Sampled:	07/31/14 11:05	Prepared:	08/27/14 14:00	Analyzed:	08/29/14 10:06
Solids:	51.74	Preparation:	EXT_3546	Dilution:	1
Batch:	4H26005	Sequence: 4I24623	Calibration:	4232001	Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.9	21.2	63.5	~~H2U~~ RE
12674-11-2	Aroclor-1016		7.95	15.9	31.9	~~H2U~~
11104-28-2	Aroclor-1221		7.95	15.9	31.9	~~H2U~~
11141-16-5	Aroclor-1232		7.95	15.9	31.9	~~H2U~~
53469-21-9	Aroclor-1242		7.95	15.9	31.9	~~H2U~~
12672-29-6	Aroclor-1248		7.95	15.9	31.9	~~H2U~~
11097-69-1	Aroclor-1254		7.95	15.9	31.9	~~H2U~~
11096-82-5	Aroclor-1260		7.95	15.9	31.9	~~H2U~~
37324-23-5	Aroclor-1262		7.95	15.9	31.9	~~H2U~~
11100-14-4	Aroclor-1268		7.95	15.9	31.9	~~H2U~~

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.79	22.25	70.0	70 - 125	H2
Tetrachloro-m-xylene [2C]	31.79	23.63	74.3	70 - 125	H2
Decachlorobiphenyl	31.79	13.96	43.9	60 - 125	*H2
Decachlorobiphenyl [2C]	31.79	15.28	48.1	60 - 125	*H2

SAC 10/14/14

E30

ANALYSIS DATA SHEET

VWW06-SD037-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-17RE1	File ID:	031F3101.D
Sampled:	07/31/14 12:20	Prepared:	08/08/14 13:36	Analyzed:	08/25/14 21:04
Solids:	43.31	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence: 4H24102	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		18.8	25.0	75.0	~~U~~ ~~U~~ ~~U~~
12674-11-2	Aroclor-1016		9.39	18.8	37.6	U
11104-28-2	Aroclor-1221		9.39	18.8	37.6	U
11141-16-5	Aroclor-1232		9.39	18.8	37.6	U
53469-21-9	Aroclor-1242		9.39	18.8	37.6	U
12672-29-6	Aroclor-1248		9.39	18.8	37.6	U
11097-69-1	Aroclor-1254 [2C]		9.39	18.8	37.6	U
11096-82-5	Aroclor-1260		9.39	18.8	37.6	U
37324-23-5	Aroclor-1262		9.39	18.8	37.6	U
11100-14-4	Aroclor-1268		9.39	18.8	37.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	37.53	14.23	37.9	70 - 125	*
Tetrachloro-m-xylene [2C]	37.53	15.04	40.1	70 - 125	*
Decachlorobiphenyl	37.53	6.935	18.5	60 - 125	*
Decachlorobiphenyl [2C]	37.53	7.613	20.3	60 - 125	*

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ANALYSIS DATA SHEET

VWW06-SD037-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-17RE2	File ID:	059F5901.D
Sampled:	07/31/14 12:20	Prepared:	08/29/14 12:17	Analyzed:	09/05/14 03:14
Solids:	43.31	Preparation:	EXT_3546	Dilution:	1
Batch:	4H29007	Sequence: 4I25101	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	67.9	18.6	24.8	74.3	J H2J HT
12674-11-2	Aroclor-1016		9.31	18.6	37.3	UJ H2U
11104-28-2	Aroclor-1221		9.31	18.6	37.3	H2U
11141-16-5	Aroclor-1232		9.31	18.6	37.3	H2U
53469-21-9	Aroclor-1242 [2C]		9.31	18.6	37.3	H2U
12672-29-6	Aroclor-1248		9.31	18.6	37.3	H2U
11097-69-1	Aroclor-1254 [2C]	67.9	9.31	18.6	37.3	J H2
11096-82-5	Aroclor-1260		9.31	18.6	37.3	UJ H2U
37324-23-5	Aroclor-1262		9.31	18.6	37.3	H2U
11100-14-4	Aroclor-1268		9.31	18.6	37.3	H2U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	37.19	38.29	103	70 - 125	H2
Tetrachloro-m-xylene [2C]	37.19	38.20	103	70 - 125	H2
Decachlorobiphenyl	37.19	36.06	96.9	60 - 125	H2
Decachlorobiphenyl [2C]	37.19	40.18	108	60 - 125	H2

JAC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD037-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-18RE1	File ID:	038F3801.D
Sampled:	07/31/14 12:25	Prepared:	08/08/14 13:36	Analyzed:	08/25/14 22:46
Solids:	52.27	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence:	4H24102	Calibration:	4232001
Instrument:	GC-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.7	20.9	62.8	U
12674-11-2	Aroclor-1016		7.86	15.7	31.5	U
11104-28-2	Aroclor-1221		7.86	15.7	31.5	U
11141-16-5	Aroclor-1232		7.86	15.7	31.5	U
53469-21-9	Aroclor-1242		7.86	15.7	31.5	U
12672-29-6	Aroclor-1248		7.86	15.7	31.5	U
11097-69-1	Aroclor-1254		7.86	15.7	31.5	U
11096-82-5	Aroclor-1260		7.86	15.7	31.5	U
37324-23-5	Aroclor-1262		7.86	15.7	31.5	U
11100-14-4	Aroclor-1268		7.86	15.7	31.5	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.43	25.18	80.1	70 - 125	
Tetrachloro-m-xylene [2C]	31.43	26.70	85.0	70 - 125	
Decachlorobiphenyl	31.43	22.91	72.9	60 - 125	
Decachlorobiphenyl [2C]	31.43	24.59	78.3	60 - 125	

SDC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD037-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-19	File ID:	078F7801.D
Sampled:	07/31/14 12:30	Prepared:	08/08/14 13:36	Analyzed:	08/21/14 06:19
Solids:	52.64	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence: 4H23711	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.1	20.1	60.3	U
12674-11-2	Aroclor-1016		7.55	15.1	30.2	U
11104-28-2	Aroclor-1221		7.55	15.1	30.2	U
11141-16-5	Aroclor-1232		7.55	15.1	30.2	U
53469-21-9	Aroclor-1242		7.55	15.1	30.2	U
12672-29-6	Aroclor-1248		7.55	15.1	30.2	U
11097-69-1	Aroclor-1254		7.55	15.1	30.2	U
11096-82-5	Aroclor-1260		7.55	15.1	30.2	U
37324-23-5	Aroclor-1262		7.55	15.1	30.2	U
11100-14-4	Aroclor-1268		7.55	15.1	30.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.18	23.40	77.6	70 - 125	
Tetrachloro-m-xylene [2C]	30.18	23.51	77.9	70 - 125	
Decachlorobiphenyl	30.18	18.90	62.6	60 - 125	
Decachlorobiphenyl [2C]	30.18	19.45	64.5	60 - 125	

SAC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD037-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-20	File ID:	079F2901.D
Sampled:	07/31/14 12:35	Prepared:	08/08/14 13:36	Analyzed:	08/21/14 06:33
Solids:	51.61	Preparation:	EXT_3546	Dilution:	1
Batch:	4H07025	Sequence: 4H23711	Calibration:	4232001	Instrument: GIL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.6	20.7	62.2	U
12674-11-2	Aroclor-1016		7.79	15.6	31.2	U
11104-28-2	Aroclor-1221		7.79	15.6	31.2	U
11141-16-5	Aroclor-1232		7.79	15.6	31.2	U
53469-21-9	Aroclor-1242		7.79	15.6	31.2	U
12672-29-6	Aroclor-1248		7.79	15.6	31.2	U
11097-69-1	Aroclor-1254		7.79	15.6	31.2	U
11096-82-5	Aroclor-1260		7.79	15.6	31.2	U
37324-23-5	Aroclor-1262		7.79	15.6	31.2	U
11100-14-4	Aroclor-1268		7.79	15.6	31.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.13	24.59	79.0	70 - 125	
Tetrachloro-m-xylene [2C]	31.13	24.63	79.1	70 - 125	
Decachlorobiphenyl	31.13	21.95	70.5	60 - 125	
Decachlorobiphenyl [2C]	31.13	22.59	72.6	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD037P-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-21	File ID:	023F2301.D
Sampled:	07/31/14 12:40	Prepared:	08/11/14 08:29	Analyzed:	08/12/14 18:29
Solids:	54.53	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08016	Sequence: 4H22602	Calibration:	4209006	Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.0	20.0	60.1	U
12674-11-2	Aroclor-1016		7.53	15.0	30.1	U
11104-28-2	Aroclor-1221		7.53	15.0	30.1	U
11141-16-5	Aroclor-1232		7.53	15.0	30.1	U
53469-21-9	Aroclor-1242		7.53	15.0	30.1	U
12672-29-6	Aroclor-1248		7.53	15.0	30.1	U
11097-69-1	Aroclor-1254		7.53	15.0	30.1	U
11096-82-5	Aroclor-1260		7.53	15.0	30.1	U
37324-23-5	Aroclor-1262		7.53	15.0	30.1	U
11100-14-4	Aroclor-1268		7.53	15.0	30.1	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.08	21.25	70.6	70 - 125	
Tetrachloro-m-xylene [2C]	30.08	22.06	73.3	70 - 125	
Decachlorobiphenyl	30.08	22.38	74.4	60 - 125	
Decachlorobiphenyl [2C]	30.08	23.23	77.2	60 - 125	

QC 10/14/14

C36

ANALYSIS DATA SHEET

VWW06-EB01-080114

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU16	
Matrix:	Water	Laboratory ID:	1408016-22	File ID:	038F3801.D
Sampled:	08/01/14 06:30	Prepared:	08/08/14 17:51	Analyzed:	08/11/14 19:15
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 4H07026 Sequence: 4H22502 Calibration: 4209006 Instrument: GL-ECD5

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
NA	Total PCBs		0.118	0.245	0.490	~~U~~ 0.54
12674-11-2	Aroclor-1016		0.118	0.245	0.490	U
11104-28-2	Aroclor-1221		0.118	0.245	0.490	U
11141-16-5	Aroclor-1232		0.118	0.245	0.490	U
53469-21-9	Aroclor-1242		0.118	0.245	0.490	U
12672-29-6	Aroclor-1248		0.118	0.245	0.490	U
11097-69-1	Aroclor-1254		0.118	0.245	0.490	U
11096-82-5	Aroclor-1260		0.118	0.245	0.490	U
37324-23-5	Aroclor-1262		0.118	0.245	0.490	U
11100-14-4	Aroclor-1268		0.118	0.245	0.490	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	0.4902	0.3180	64.9	25 - 140	
Tetrachloro-m-xylene [2C]	0.4902	0.3390	69.2	25 - 140	
Decachlorobiphenyl	0.4902	0.1644	33.5	40 - 135	
Decachlorobiphenyl [2C]	0.4902	0.1770	36.1	40 - 135	

JBC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD036-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-23	File ID:	034F3401.D
Sampled:	08/01/14 08:40	Prepared:	08/11/14 08:29	Analyzed:	08/26/14 19:50
Solids:	48.33	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08016	Sequence:	4H23912	Calibration:	4232001
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	114	16.9	22.5	67.6	
12674-11-2	Aroclor-1016 [2C]		8.47	16.9	33.9	U
11104-28-2	Aroclor-1221		8.47	16.9	33.9	U
11141-16-5	Aroclor-1232		8.47	16.9	33.9	U
53469-21-9	Aroclor-1242 [2C]		8.47	16.9	33.9	U
12672-29-6	Aroclor-1248		8.47	16.9	33.9	U
11097-69-1	Aroclor-1254 [2C]	114	8.47	16.9	33.9	
11096-82-5	Aroclor-1260		8.47	16.9	33.9	U
37324-23-5	Aroclor-1262		8.47	16.9	33.9	U
11100-14-4	Aroclor-1268		8.47	16.9	33.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	33.85	26.02	76.9	70 - 125	
Tetrachloro-m-xylene [2C]	33.85	26.51	78.3	70 - 125	
Decachlorobiphenyl	33.85	27.03	79.9	60 - 125	
Decachlorobiphenyl [2C]	33.85	29.25	86.4	60 - 125	

JLC 10/14/14

C37A

ANALYSIS DATA SHEET

VWW06-SD036-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-24	File ID:	025F2501.D
Sampled:	08/01/14 08:45	Prepared:	08/11/14 08:29	Analyzed:	08/12/14 18:57
Solids:	62.14	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08016	Sequence:	4H22602	Calibration:	4209006
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.1	17.5	52.5	U
12674-11-2	Aroclor-1016		6.58	13.1	26.3	U
11104-28-2	Aroclor-1221		6.58	13.1	26.3	U
11141-16-5	Aroclor-1232		6.58	13.1	26.3	U
53469-21-9	Aroclor-1242		6.58	13.1	26.3	U
12672-29-6	Aroclor-1248		6.58	13.1	26.3	U
11097-69-1	Aroclor-1254		6.58	13.1	26.3	U
11096-82-5	Aroclor-1260		6.58	13.1	26.3	U
37324-23-5	Aroclor-1262		6.58	13.1	26.3	U
11100-14-4	Aroclor-1268		6.58	13.1	26.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.29	19.69	74.9	70 - 125	
Tetrachloro-m-xylene [2C]	26.29	20.07	76.3	70 - 125	
Decachlorobiphenyl	26.29	22.05	83.9	60 - 125	
Decachlorobiphenyl [2C]	26.29	22.16	84.3	60 - 125	

JAC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD036-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-25	File ID:	028F2801.D
Sampled:	08/01/14 08:50	Prepared:	08/11/14 08:29	Analyzed:	08/12/14 19:38
Solids:	54.11	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08016	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.0	20.0	60.0	U
12674-11-2	Aroclor-1016		7.51	15.0	30.1	U
11104-28-2	Aroclor-1221		7.51	15.0	30.1	U
11141-16-5	Aroclor-1232		7.51	15.0	30.1	U
53469-21-9	Aroclor-1242		7.51	15.0	30.1	U
12672-29-6	Aroclor-1248		7.51	15.0	30.1	U
11097-69-1	Aroclor-1254		7.51	15.0	30.1	U
11096-82-5	Aroclor-1260		7.51	15.0	30.1	U
37324-23-5	Aroclor-1262		7.51	15.0	30.1	U
11100-14-4	Aroclor-1268		7.51	15.0	30.1	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.02	20.90	69.6	70 - 125	
Tetrachloro-m-xylene [2C]	30.02	22.10	73.6	70 - 125	
Decachlorobiphenyl	30.02	22.21	74.0	60 - 125	
Decachlorobiphenyl [2C]	30.02	22.60	75.3	60 - 125	

039

ANALYSIS DATA SHEET

VWW06-SD036-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-26	File ID:	029F2901.D
Sampled:	08/01/14 08:55	Prepared:	08/11/14 08:29	Analyzed:	08/12/14 19:51
Solids:	55.61	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08016	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.9	19.9	59.6	U
12674-11-2	Aroclor-1016		7.46	14.9	29.9	U
11104-28-2	Aroclor-1221		7.46	14.9	29.9	U
11141-16-5	Aroclor-1232		7.46	14.9	29.9	U
53469-21-9	Aroclor-1242		7.46	14.9	29.9	U
12672-29-6	Aroclor-1248		7.46	14.9	29.9	U
11097-69-1	Aroclor-1254		7.46	14.9	29.9	U
11096-82-5	Aroclor-1260		7.46	14.9	29.9	U
37324-23-5	Aroclor-1262		7.46	14.9	29.9	U
11100-14-4	Aroclor-1268		7.46	14.9	29.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.81	20.33	68.2	70 - 125	*
Tetrachloro-m-xylene [2C]	29.81	21.43	71.9	70 - 125	
Decachlorobiphenyl	29.81	23.23	77.9	60 - 125	
Decachlorobiphenyl [2C]	29.81	23.76	79.7	60 - 125	

JBC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD035-0006

Laboratory	Empirical Laboratories, LLC		SDG	1408016	
Client	CH2M Hill, Inc.		Project	NTR Vieques CTO 113 SWMU 6	
Matrix	Solid	Laboratory ID	1408016-27	File ID:	035R3501.D
Sampled	08/01/14 09:35	Prepared	08/11/14 08:29	Analyzed	08/26/14 20:04
Solids	41.61	Preparation	EXT_3546	Dilution	1
Batch	4H08016	Sequence	4H23912	Calibration	4232001	Instrument	GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	28.4	19.6	26.1	78.3	J
12674-11-2	Aroclor-1016		9.80	19.6	39.2	U
11104-28-2	Aroclor-1221		9.80	19.6	39.2	U
11141-16-5	Aroclor-1232		9.80	19.6	39.2	U
53469-21-9	Aroclor-1242		9.80	19.6	39.2	U
12672-29-6	Aroclor-1248		9.80	19.6	39.2	U
11097-69-1	Aroclor-1254 [2C]	28.4	9.80	19.6	39.2	J
11096-82-5	Aroclor-1260		9.80	19.6	39.2	U
37324-23-5	Aroclor-1262		9.80	19.6	39.2	U
11100-14-4	Aroclor-1268		9.80	19.6	39.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	39.17	27.24	69.6	70 - 125	
Tetrachloro-m-xylene [2C]	39.17	27.19	69.4	70 - 125	
Decachlorobiphenyl	39.17	26.74	68.3	60 - 125	
Decachlorobiphenyl [2C]	39.17	28.41	72.5	60 - 125	

corrected x3 JAC 1/14/14

ANALYSIS DATA SHEET

VWW06-SD035P-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-28	File ID:	036R3601.D
Sampled:	08/01/14 09:40	Prepared:	08/11/14 08:29	Analyzed:	08/26/14 20:19
Solids:	39.71	Preparation:	EXT 3546	Dilution:	1
Batch:	4H08016	Sequence:	4H23912	Calibration:	4232001

Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	41.7	20.0	26.6	79.8	PJ
12674-11-2	Aroclor-1016		9.99	20.0	40.0	U
11104-28-2	Aroclor-1221		9.99	20.0	40.0	U
11141-16-5	Aroclor-1232		9.99	20.0	40.0	U
53469-21-9	Aroclor-1242		9.99	20.0	40.0	U
12672-29-6	Aroclor-1248		9.99	20.0	40.0	U
11097-69-1	Aroclor-1254 (2C)	41.7	9.99	20.0	40.0	J
11096-82-5	Aroclor-1260		9.99	20.0	40.0	U
37324-23-5	Aroclor-1262		9.99	20.0	40.0	U
11100-14-4	Aroclor-1268		9.99	20.0	40.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	39.95	24.07	60.3	70 - 125	*
Tetrachloro-m-xylene (2C)	39.95	24.65	61.7	70 - 125	*
Decachlorobiphenyl	39.95	21.52	53.9	60 - 125	*
Decachlorobiphenyl (2C)	39.95	23.09	57.8	60 - 125	*

Corrected KB QAC 11/14/14

ANALYSIS DATA SHEET

VWW06-SD035P-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-28RE1	File ID:	060R6001.D
Sampled:	08/01/14 09:40	Prepared:	08/29/14 12:17	Analyzed:	09/05/14 03:28
Solids:	39.71	Preparation:	EXT_3546	Dilution:	1
Batch:	4H29007	Sequence: 4I25101	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	66.1	20.3	27.1	81.3	H2J
12674-11-2	Aroclor-1016		10.2	20.3	40.8	H2U
11104-28-2	Aroclor-1221		10.2	20.3	40.8	H2U
11141-16-5	Aroclor-1232		10.2	20.3	40.8	H2U
53469-21-9	Aroclor-1242 [2C]		10.2	20.3	40.8	H2U
12672-29-6	Aroclor-1248		10.2	20.3	40.8	H2U
11097-69-1	Aroclor-1254 [2C]	66.1	10.2	20.3	40.8	H2
11096-82-5	Aroclor-1260		10.2	20.3	40.8	H2U
37324-23-5	Aroclor-1262		10.2	20.3	40.8	H2U
11100-14-4	Aroclor-1268		10.2	20.3	40.8	H2U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	40.70	35.19	86.5	70 - 125	H2
Tetrachloro-m-xylene [2C]	40.70	35.76	87.9	70 - 125	H2
Decachlorobiphenyl	40.70	31.58	77.6	60 - 125	H2
Decachlorobiphenyl [2C]	40.70	35.17	86.4	60 - 125	H2

DAC 10/4/14

043

ANALYSIS DATA SHEET

VWW06-SD035-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-29	File ID:	038F3801.D
Sampled:	08/01/14 09:45	Prepared:	08/11/14 08:29	Analyzed:	08/12/14 21:55
Solids:	56.30	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08016	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.1	18.8	56.3	U
12674-11-2	Aroclor-1016		7.05	14.1	28.2	U
11104-28-2	Aroclor-1221		7.05	14.1	28.2	U
11141-16-5	Aroclor-1232		7.05	14.1	28.2	U
53469-21-9	Aroclor-1242		7.05	14.1	28.2	U
12672-29-6	Aroclor-1248		7.05	14.1	28.2	U
11097-69-1	Aroclor-1254		7.05	14.1	28.2	U
11096-82-5	Aroclor-1260		7.05	14.1	28.2	U
37324-23-5	Aroclor-1262		7.05	14.1	28.2	U
11100-14-4	Aroclor-1268		7.05	14.1	28.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	28.19	19.62	69.6	70 - 125	*
Tetrachloro-m-xylene [2C]	28.19	20.73	73.5	70 - 125	
Decachlorobiphenyl	28.19	22.77	80.8	60 - 125	
Decachlorobiphenyl [2C]	28.19	23.12	82.0	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD035-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-30	File ID:	039F3901.D
Sampled:	08/01/14 09:50	Prepared:	08/11/14 08:29	Analyzed:	08/12/14 22:08
Solids:	56.62	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08016	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.7	19.5	58.6	~~U~~ U ESL
12674-11-2	Aroclor-1016		7.34	14.7	29.4	U
11104-28-2	Aroclor-1221		7.34	14.7	29.4	U
11141-16-5	Aroclor-1232		7.34	14.7	29.4	U
53469-21-9	Aroclor-1242		7.34	14.7	29.4	U
12672-29-6	Aroclor-1248		7.34	14.7	29.4	U
11097-69-1	Aroclor-1254		7.34	14.7	29.4	U
11096-82-5	Aroclor-1260		7.34	14.7	29.4	U
37324-23-5	Aroclor-1262		7.34	14.7	29.4	U
11100-14-4	Aroclor-1268		7.34	14.7	29.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.32	18.76	64.0	70 - 125	*
Tetrachloro-m-xylene [2C]	29.32	20.27	69.1	70 - 125	*
Decachlorobiphenyl	29.32	21.37	72.9	60 - 125	
Decachlorobiphenyl [2C]	29.32	21.85	74.5	60 - 125	

SKC 10/14/14

045

ANALYSIS DATA SHEET

VWW06-SD035-7278

Laboratory:	Empirical Laboratories, LLC		SDG	1408016	
Client:	CH2M Hill, Inc.		Project	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-31	File ID:	040F4001.D
Sampled:	08/01/14 09:55	Prepared:	08/11/14 08:29	Analyzed:	08/12/14 22:22
Solids:	56.34	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08016	Sequence:	4H22602	Calibration:	4209006
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.8	19.7	59.0	U
12674-11-2	Aroclor-1016		7.39	14.8	29.6	U
11104-28-2	Aroclor-1221		7.39	14.8	29.6	U
11141-16-5	Aroclor-1232		7.39	14.8	29.6	U
53469-21-9	Aroclor-1242		7.39	14.8	29.6	U
12672-29-6	Aroclor-1248		7.39	14.8	29.6	U
11097-69-1	Aroclor-1254		7.39	14.8	29.6	U
11096-82-5	Aroclor-1260		7.39	14.8	29.6	U
37324-23-5	Aroclor-1262		7.39	14.8	29.6	U
11100-14-4	Aroclor-1268		7.39	14.8	29.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.52	20.39	69.1	70 - 125	*
Tetrachloro-m-xylene [2C]	29.52	21.58	73.1	70 - 125	
Decachlorobiphenyl	29.52	22.80	77.2	60 - 125	
Decachlorobiphenyl [2C]	29.52	23.46	79.5	60 - 125	

JAC 10/24/14

ANALYSIS DATA SHEET

VWW06-SD034-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-32	File ID:	037R3701.D
Sampled:	08/01/14 10:30	Prepared:	08/11/14 08:29	Analyzed:	08/26/14 20:33
Solids:	32.79	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08016	Sequence: 4H23912	Calibration:	4232001	Instrument: GC-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		25.2	33.5	101	LJ U SSL
12674-11-2	Aroclor-1016		12.6	25.2	50.4	U
11104-28-2	Aroclor-1221		12.6	25.2	50.4	U
11141-16-5	Aroclor-1232		12.6	25.2	50.4	U
53469-21-9	Aroclor-1242		12.6	25.2	50.4	U
12672-29-6	Aroclor-1248		12.6	25.2	50.4	U
11097-69-1	Aroclor-1254		12.6	25.2	50.4	U
11096-82-5	Aroclor-1260		12.6	25.2	50.4	U
37324-23-5	Aroclor-1262		12.6	25.2	50.4	U
11100-14-4	Aroclor-1268		12.6	25.2	50.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	50.32	23.87	47.4	70 - 125	
Tetrachloro-m-xylene [2C]	50.32	24.48	48.6	70 - 125	
Decachlorobiphenyl	50.32	22.52	44.8	60 - 125	
Decachlorobiphenyl [2C]	50.32	24.43	48.5	60 - 125	

JAC 10/14/14

047

ANALYSIS DATA SHEET

VWW06-SD034-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-32RE1	File ID:	061F6101.D
Sampled:	08/01/14 10:30	Prepared:	08/29/14 12:17	Analyzed:	09/05/14 03:43
Solids:	32.79	Preparation:	EXT_3546	Dilution:	1
Batch:	4H29007	Sequence: 4I25101	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		25.1	33.4	100	H2U
12674-11-2	Aroclor-1016		12.5	25.1	50.2	H2U
11104-28-2	Aroclor-1221		12.5	25.1	50.2	H2U
11141-16-5	Aroclor-1232		12.5	25.1	50.2	H2U
53469-21-9	Aroclor-1242		12.5	25.1	50.2	H2U
12672-29-6	Aroclor-1248		12.5	25.1	50.2	H2U
11097-69-1	Aroclor-1254		12.5	25.1	50.2	H2U
11096-82-5	Aroclor-1260		12.5	25.1	50.2	H2U
37324-23-5	Aroclor-1262		12.5	25.1	50.2	H2U
11100-14-4	Aroclor-1268		12.5	25.1	50.2	H2U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	50.13	49.14	98.0	70 - 125	H2
Tetrachloro-m-xylene [2C]	50.13	50.09	99.9	70 - 125	H2
Decachlorobiphenyl	50.13	40.55	80.9	60 - 125	H2
Decachlorobiphenyl [2C]	50.13	45.21	90.2	60 - 125	H2

JAC 10/14/14

048

ANALYSIS DATA SHEET

VWW06-SD034-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-33	File ID:	042F4201.D
Sampled:	08/01/14 10:35	Prepared:	08/11/14 08:29	Analyzed:	08/12/14 22:49
Solids:	58.02	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08016	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.1	18.7	56.2	U
12674-11-2	Aroclor-1016		7.04	14.1	28.2	U
11104-28-2	Aroclor-1221		7.04	14.1	28.2	U
11141-16-5	Aroclor-1232		7.04	14.1	28.2	U
53469-21-9	Aroclor-1242		7.04	14.1	28.2	U
12672-29-6	Aroclor-1248		7.04	14.1	28.2	U
11097-69-1	Aroclor-1254		7.04	14.1	28.2	U
11096-82-5	Aroclor-1260		7.04	14.1	28.2	U
37324-23-5	Aroclor-1262		7.04	14.1	28.2	U
11100-14-4	Aroclor-1268		7.04	14.1	28.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	28.13	19.42	69.1	70 - 125	
Tetrachloro-m-xylene [2C]	28.13	20.88	74.2	70 - 125	
Decachlorobiphenyl	28.13	21.23	75.5	60 - 125	
Decachlorobiphenyl [2C]	28.13	21.78	77.4	60 - 125	

JAC 10/14/14

049

ANALYSIS DATA SHEET

VWW06-SD034-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-34	File ID:	043F4301.D
Sampled:	08/01/14 10:40	Prepared:	08/11/14 08:29	Analyzed:	08/12/14 23:03
Solids:	51.80	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08016	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		16.0	21.3	63.9	UJ
12674-11-2	Aroclor-1016		8.01	16.0	32.1	U
11104-28-2	Aroclor-1221		8.01	16.0	32.1	U
11141-16-5	Aroclor-1232		8.01	16.0	32.1	U
53469-21-9	Aroclor-1242		8.01	16.0	32.1	U
12672-29-6	Aroclor-1248		8.01	16.0	32.1	U
11097-69-1	Aroclor-1254		8.01	16.0	32.1	U
11096-82-5	Aroclor-1260		8.01	16.0	32.1	U
37324-23-5	Aroclor-1262		8.01	16.0	32.1	U
11100-14-4	Aroclor-1268		8.01	16.0	32.1	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	32.00	19.27	60.2	70 - 125	
Tetrachloro-m-xylene [2C]	32.00	20.91	65.3	70 - 125	
Decachlorobiphenyl	32.00	21.40	66.9	60 - 125	
Decachlorobiphenyl [2C]	32.00	22.02	68.8	60 - 125	

JAC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD034-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408016-35	File ID:	044F4401.D
Sampled:	08/01/14 10:45	Prepared:	08/11/14 08:29	Analyzed:	08/12/14 23:17
Solids:	62.46	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08016	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		12.9	17.1	51.4	UJ U SQ
12674-11-2	Aroclor-1016		6.44	12.9	25.8	U
11104-28-2	Aroclor-1221		6.44	12.9	25.8	U
11141-16-5	Aroclor-1232		6.44	12.9	25.8	U
53469-21-9	Aroclor-1242		6.44	12.9	25.8	U
12672-29-6	Aroclor-1248		6.44	12.9	25.8	U
11097-69-1	Aroclor-1254		6.44	12.9	25.8	U
11096-82-5	Aroclor-1260		6.44	12.9	25.8	U
37324-23-5	Aroclor-1262		6.44	12.9	25.8	U
11100-14-4	Aroclor-1268		6.44	12.9	25.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	25.72	16.37	63.6	70 - 125	
Tetrachloro-m-xylene [2C]	25.72	17.70	68.8	70 - 125	
Decachlorobiphenyl	25.72	18.94	73.6	60 - 125	
Decachlorobiphenyl [2C]	25.72	19.49	75.8	60 - 125	

JLK 10/14/14

051

ANALYSIS DATA SHEET

VWW06-EB01-080414

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Water	Laboratory ID:	1408016-36	File ID:	039F3901.D
Sampled:	08/04/14 07:00	Prepared:	08/08/14 17:51	Analyzed:	08/11/14 19:28
Solids:		Preparation:	EXT_3510	Dilution:	1
Batch:	4H07026	Sequence: 4H22502	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
NA	Total PCBs		0.115	0.240	0.481	U
12674-11-2	Aroclor-1016		0.115	0.240	0.481	U
11104-28-2	Aroclor-1221		0.115	0.240	0.481	U
11141-16-5	Aroclor-1232		0.115	0.240	0.481	U
53469-21-9	Aroclor-1242		0.115	0.240	0.481	U
12672-29-6	Aroclor-1248		0.115	0.240	0.481	U
11097-69-1	Aroclor-1254		0.115	0.240	0.481	U
11096-82-5	Aroclor-1260		0.115	0.240	0.481	U
37324-23-5	Aroclor-1262		0.115	0.240	0.481	U
11100-14-4	Aroclor-1268		0.115	0.240	0.481	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	0.4808	0.3156	65.6	25 - 140	
Tetrachloro-m-xylene [2C]	0.4808	0.3340	69.5	25 - 140	
Decachlorobiphenyl	0.4808	0.2405	50.0	40 - 135	
Decachlorobiphenyl [2C]	0.4808	0.2542	52.9	40 - 135	

JAC
11/14/14

051A

ANALYSIS DATA SHEET

VWW06-SD044-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	41107025-MS3	File ID:	024F2401.D
Sampled:		Prepared:		Analyzed:	08/25/14 19:22
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 41107025 Sequence: 41124102 Calibration: 4232001 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		6.30	12.6	25.2	U
11104-28-2	Aroclor-1221		6.30	12.6	25.2	U
11141-16-5	Aroclor-1232		6.30	12.6	25.2	U
53469-21-9	Aroclor-1242		6.30	12.6	25.2	U
12672-29-6	Aroclor-1248		6.30	12.6	25.2	U
11097-69-1	Aroclor-1254	394.6	6.30	12.6	25.2	
11096-82-5	Aroclor-1260		6.30	12.6	25.2	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	25.19	21.48	85.3	70 - 125	
Decachlorobiphenyl	25.19	20.58	81.7	60 - 125	

JLC 8/25/14

C52

ANALYSIS DATA SHEET

VWW06-SD044-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU6	
Matrix:		Laboratory ID:	4H07025-MS3	File ID:	024R2401.D
Sampled:		Prepared:		Analyzed:	08/25/14 19:22
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H07025 Sequence: 4H24102 Calibration: 4232001 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		6.30	12.6	25.2	U
11104-28-2	Aroclor-1221 [2C]		6.30	12.6	25.2	U
11141-16-5	Aroclor-1232 [2C]		6.30	12.6	25.2	U
53469-21-9	Aroclor-1242 [2C]		6.30	12.6	25.2	U
12672-29-6	Aroclor-1248 [2C]		6.30	12.6	25.2	U
11097-69-1	Aroclor-1254 [2C]	428.4	6.30	12.6	25.2	
11096-82-5	Aroclor-1260 [2C]		6.30	12.6	25.2	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	25.19	22.45	89.1	70 - 125	
Decachlorobiphenyl [2C]	25.19	21.50	85.3	60 - 125	

JC 8/28/14

053

ANALYSIS DATA SHEET

VWW06-SD037-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU6	
Matrix:		Laboratory ID:	4H07025-MS4	File ID:	039F3901.D
Sampled:		Prepared:		Analyzed:	08/25/14 23:01
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H07025 Sequence: 4H24102 Calibration: 4232001 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		7.94	15.9	31.8	U
11104-28-2	Aroclor-1221		7.94	15.9	31.8	U
11141-16-5	Aroclor-1232		7.94	15.9	31.8	U
53469-21-9	Aroclor-1242		7.94	15.9	31.8	U
12672-29-6	Aroclor-1248		7.94	15.9	31.8	U
11097-69-1	Aroclor-1254	478.3	7.94	15.9	31.8	
11096-82-5	Aroclor-1260		7.94	15.9	31.8	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC. (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.72	25.51	80.4	70 - 125	
Decachlorobiphenyl	31.72	22.95	72.4	60 - 125	

8/28/14

054

ANALYSIS DATA SHEET

VWW06-SD037-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H07025-MS4	File ID:	039R3901.D
Sampled:		Prepared:		Analyzed:	08/25/14 23:01
Solids:		Preparation:	CXT_3546	Dilution:	

Batch: 4H07025 Sequence: 4H24103 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		7.94	15.9	31.8	U
11104-28-2	Aroclor-1221 [2C]		7.94	15.9	31.8	U
11141-16-5	Aroclor-1232 [2C]		7.94	15.9	31.8	U
53469-21-9	Aroclor-1242 [2C]		7.94	15.9	31.8	U
12672-29-6	Aroclor-1248 [2C]		7.94	15.9	31.8	U
11097-69-1	Aroclor-1254 [2C]	524.0	7.94	15.9	31.8	
11096-82-5	Aroclor-1260 [2C]		7.94	15.9	31.8	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC. (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	31.72	27.07	85.4	70 - 125	
Decachlorobiphenyl [2C]	31.72	24.59	77.5	60 - 125	

JLC 82814

C55

ANALYSIS DATA SHEET

VWW06-SD044-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWM16	
Matrix:		Laboratory ID:	4H07025-MSD3	File ID:	025F2501.D
Sampled:		Prepared:		Analyzed:	08/25/14 19:36
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H07025 Sequence: 4H24102 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		6.32	12.6	25.3	U
11104-28-2	Aroclor-1221		6.32	12.6	25.3	U
11141-16-5	Aroclor-1232		6.32	12.6	25.3	U
53469-21-9	Aroclor-1242		6.32	12.6	25.3	U
12672-29-6	Aroclor-1248		6.32	12.6	25.3	U
11097-69-1	Aroclor-1254	377.9	6.32	12.6	25.3	
11096-82-5	Aroclor-1260		6.32	12.6	25.3	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	25.24	21.20	84.0	70 - 125	
Decachlorobiphenyl	25.24	18.74	74.2	60 - 125	

JAC 8/28/14

056

ANALYSIS DATA SHEET

VWW06-SD044-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWM016	
Matrix:		Laboratory ID:	4H07025-MSD3	File ID:	025R2501.D
Sampled:		Prepared:		Analyzed:	08/25/14 19:36
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H07025 Sequence: 4H24102 Calibration: 1232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		6.32	12.6	25.3	U
11104-28-2	Aroclor-1221 [2C]		6.32	12.6	25.3	U
11141-16-5	Aroclor-1232 [2C]		6.32	12.6	25.3	U
53469-21-9	Aroclor-1242 [2C]		6.32	12.6	25.3	U
12672-29-6	Aroclor-1248 [2C]		6.32	12.6	25.3	U
11097-69-1	Aroclor-1254 [2C]	**401.2**	6.32	12.6	25.3	
11096-82-5	Aroclor-1260 [2C]		6.32	12.6	25.3	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC. (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	25.24	22.44	88.9	70 - 125	
Decachlorobiphenyl [2C]	25.24	19.60	77.7	60 - 125	

SJC 82814

057

ANALYSIS DATA SHEET

VWW06-SD037-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H07025-MSD4	File ID:	040F4001.D
Sampled:		Prepared:		Analyzed:	08/25/14 23:15
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H07025 Sequence: 4H24102 Calibration: 4232001 Instrument: GL-EC133

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		7.76	15.5	31.1	U
11104-28-2	Aroclor-1221		7.76	15.5	31.1	U
11141-16-5	Aroclor-1232		7.76	15.5	31.1	U
53469-21-9	Aroclor-1242		7.76	15.5	31.1	U
12672-29-6	Aroclor-1248		7.76	15.5	31.1	U
11097-69-1	Aroclor-1254	439.4	7.76	15.5	31.1	
11096-82-5	Aroclor-1260		7.76	15.5	31.1	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.00	23.27	75.1	70 - 125	
Decachlorobiphenyl	31.00	22.12	71.4	60 - 125	

JLE 82814

058

ANALYSIS DATA SHEET

VWW06-SD037-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU6	
Matrix:		Laboratory ID:	4H07025-MSD4	File ID:	040R4001.D
Sampled:		Prepared:		Analyzed:	08/25/14 23:15
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H07025 Sequence: 4H24102 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		7.76	15.5	31.1	U
11104-28-2	Aroclor-1221 [2C]		7.76	15.5	31.1	U
11141-16-5	Aroclor-1232 [2C]		7.76	15.5	31.1	U
53469-21-9	Aroclor-1242 [2C]		7.76	15.5	31.1	U
12672-29-6	Aroclor-1248 [2C]		7.76	15.5	31.1	U
11097-69-1	Aroclor-1254 [2C]	484.9	7.76	15.5	31.1	
11096-82-5	Aroclor-1260 [2C]		7.76	15.5	31.1	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	31.00	24.98	80.6	70 - 125	
Decachlorobiphenyl [2C]	31.00	23.91	77.1	60 - 125	

SAC 8/28/14

059

ANALYSIS DATA SHEET

VWW06-SD036-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H08016-MS1	File ID:	026F2601.D
Sampled:		Prepared:		Analyzed:	08/12/14 19:11
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H08016 Sequence: 4H22602 Calibration: 4209006 Instrument: GC-ECD3

CAS NO.	COMPOUND	DNC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		6.53	13.0	26.1	U
11104-28-2	Aroclor-1221		6.53	13.0	26.1	U
11141-16-5	Aroclor-1232		6.53	13.0	26.1	U
53469-21-9	Aroclor-1242		6.53	13.0	26.1	U
12672-29-6	Aroclor-1248		6.53	13.0	26.1	U
11097-69-1	Aroclor-1254	348.8	6.53	13.0	26.1	
11096-82-5	Aroclor-1260		6.53	13.0	26.1	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/kg dry)	DONE (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.09	18.36	70.4	70 - 125	
Decachlorobiphenyl	26.09	20.34	78.0	60 - 125	

SJC 8/28/14

060

ANALYSIS DATA SHEET

VWW06-SD036-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	41408016-MS1	File ID:	026R2601.D
Sampled:		Prepared:		Analyzed:	08/12/14 19:11
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 41408016 Sequence: 41R22602 Calibration: 4209006 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		6.53	13.0	26.1	U
11104-28-2	Aroclor-1221 [2C]		6.53	13.0	26.1	U
11141-16-5	Aroclor-1232 [2C]		6.53	13.0	26.1	U
53469-21-9	Aroclor-1242 [2C]		6.53	13.0	26.1	U
12672-29-6	Aroclor-1248 [2C]		6.53	13.0	26.1	U
11097-69-1	Aroclor-1254 [2C]	375.8	6.53	13.0	26.1	
11096-82-5	Aroclor-1260 [2C]		6.53	13.0	26.1	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	26.09	19.13	73.3	70 - 125	
Decachlorobiphenyl [2C]	26.09	20.46	78.4	60 - 125	

JAC 8/28/14

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ANALYSIS DATA SHEET

VWW06-SD036-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4108016-MSD1	File ID:	027F2701.D
Sampled:		Prepared:		Analyzed:	08/12/14 19:24
Solids:		Preparation:	EXT 3546	Dilution:	

Batch: 4H08016 Sequence: 4I122602 Calibration: 4209006 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		6.36	12.7	25.5	U
11104-28-2	Aroclor-1221		6.36	12.7	25.5	U
11141-16-5	Aroclor-1232		6.36	12.7	25.5	U
53469-21-9	Aroclor-1242		6.36	12.7	25.5	U
12672-29-6	Aroclor-1248		6.36	12.7	25.5	U
11097-69-1	Aroclor-1254	359.0	6.36	12.7	25.5	
11096-82-5	Aroclor-1260		6.36	12.7	25.5	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	25.41	18.98	74.7	70 - 125	
Decachlorobiphenyl	25.41	20.43	80.4	60 - 125	

gjc
8/28/14

C62

ANALYSIS DATA SHEET

VWW06-SD036-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU16	
Matrix:		Laboratory ID:	4H08016-MSD1	File ID:	027R2701.D
Sampled:		Prepared:		Analyzed:	08/12/14 19:24
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H08016 Sequence: 4H22602 Calibration: 4209006 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		6.36	12.7	25.5	U
11104-28-2	Aroclor-1221 [2C]		6.36	12.7	25.5	U
11141-16-5	Aroclor-1232 [2C]		6.36	12.7	25.5	U
53469-21-9	Aroclor-1242 [2C]		6.36	12.7	25.5	U
12672-29-6	Aroclor-1248 [2C]		6.36	12.7	25.5	U
11097-69-1	Aroclor-1254 [2C]	386.1	6.36	12.7	25.5	
11096-82-5	Aroclor-1260 [2C]		6.36	12.7	25.5	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC. (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	25.41	19.80	77.9	70 - 125	
Decachlorobiphenyl [2C]	25.41	20.66	81.3	60 - 125	

JLC 8/28/14

063

ANALYSIS DATA SHEET

VWW06-SD038-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H26005-MS1	File ID:	081F8101.D
Sampled:		Prepared:		Analyzed:	08/29/14 09:36
Solids:		Preparation:	EXT 3546	Dilution:	

Batch: 4H26005 Sequence: 4I24623 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	ONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016	242.9	6.71	13.4	26.9	H2
11104-28-2	Aroclor-1221		6.71	13.4	26.9	H2U
11141-16-5	Aroclor-1232		6.71	13.4	26.9	H2U
53469-21-9	Aroclor-1242		6.71	13.4	26.9	H2U
12672-29-6	Aroclor-1248		6.71	13.4	26.9	H2U
11097-69-1	Aroclor-1254		6.71	13.4	26.9	H2U
11096-82-5	Aroclor-1260	181.2	6.71	13.4	26.9	H2

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.82	23.69	88.3	70 - 125	H2
Decachlorobiphenyl	26.82	16.65	62.1	60 - 125	H2

JBC 8/28/14

064

ANALYSIS DATA SHEET

VWW06-SD038-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4126005-MS1	File ID:	081R8101.D
Sampled:		Prepared:		Analyzed:	08/29/14 09:36
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4126005 Sequence: 4124623 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]	**261.8**	6.71	13.4	26.9	H2
11104-28-2	Aroclor-1221 [2C]		6.71	13.4	26.9	H2U
11141-16-5	Aroclor-1232 [2C]		6.71	13.4	26.9	H2U
53469-21-9	Aroclor-1242 [2C]		6.71	13.4	26.9	H2U
12672-29-6	Aroclor-1248 [2C]		6.71	13.4	26.9	H2U
11097-69-1	Aroclor-1254 [2C]		6.71	13.4	26.9	H2U
11096-82-5	Aroclor-1260 [2C]	**235.5**	6.71	13.4	26.9	H2

Total Target Analytes Reported: 4

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	26.82	22.67	84.5	70 - 125	H2
Decachlorobiphenyl [2C]	26.82	18.14	67.6	60 - 125	H2

QC 8/28/14

065

ANALYSIS DATA SHEET

VWW08-SD038-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M HILL Inc		Project:	NTR Vieques CTO 113 SWMU6	
Matrix:		Laboratory ID:	41126005-MSD1	File ID:	08278201.D
Sampled:		Prepared:		Analyzed:	08/29/14 09:51
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4126005 Sequence: 4124623 Calibration: 4232001 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016	224.7	6.71	13.4	26.9	H2
11104-28-2	Aroclor-1221		6.71	13.4	26.9	H2U
11141-16-5	Aroclor-1232		6.71	13.4	26.9	H2U
53469-21-9	Aroclor-1242		6.71	13.4	26.9	H2U
12672-29-6	Aroclor-1248		6.71	13.4	26.9	H2U
11097-69-1	Aroclor-1254		6.71	13.4	26.9	H2U
11096-82-5	Aroclor-1260	171.2	6.71	13.4	26.9	H2

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.84	22.79	84.9	70 - 125	H2
Decachlorobiphenyl	26.84	14.46	53.9	60 - 125	H2

JAC 8/28/14

066

ANALYSIS DATA SHEET

VWW06-SD038-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408016	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWM116	
Matrix:		Laboratory ID:	41126005-MSD1	File ID:	082R8201.D
Sampled:		Prepared:		Analyzed:	08/29/14 09:51
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 41126005 Sequence: 4124625 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]	243.6	6.71	13.4	26.9	H2
11104-28-2	Aroclor-1221 [2C]		6.71	13.4	26.9	H2U
11141-16-5	Aroclor-1232 [2C]		6.71	13.4	26.9	H2U
53469-21-9	Aroclor-1242 [2C]		6.71	13.4	26.9	H2U
12672-29-6	Aroclor-1248 [2C]		6.71	13.4	26.9	H2U
11097-69-1	Aroclor-1254 [2C]		6.71	13.4	26.9	H2U
11096-82-5	Aroclor-1260 [2C]	219.7	6.71	13.4	26.9	H2

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	26.84	21.57	80.4	70 - 125	H2
Decachlorobiphenyl [2C]	26.84	15.79	58.8	60 - 125	H2

C67

ANALYSIS DATA SHEET

VWW06-SD044-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 08:35
% Solids: 51.97

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-01
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	182	0.555	1.11	1.85	1		SW6010C	4H19023	08/27/14 22:09
7440-66-6	Zinc	283	1.85	3.70	7.40	1		SW6010C	4H19023	08/27/14 22:09

068

ANALYSIS DATA SHEET

VWW06-SD044-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 08:40
% Solids: 64.11

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-02
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.40	0.468	0.936	1.56	1	J	SW6010C	4H19013	08/26/14 15:48
7440-66-6	Zinc	5.79	1.56	3.12	6.24	1	J	SW6010C	4H19013	08/26/14 15:48

JC 10/14/14

069

ANALYSIS DATA SHEET

VWW06-SD044-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 08:45
% Solids: 50.93

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-03
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	4.32	0.620	1.24	2.07	1	J	SW6010C	4H19023	08/27/14 22:14
7440-66-6	Zinc	5.14	4.13	8.27	16.5	2	BJ	SW6010C	4H19023	08/29/14 13:00

ANALYSIS DATA SHEET

VWW06-SD044-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 08:50
% Solids: 57.24

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-04
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.84	0.519	1.04	1.73	1		SW6010C	4H19023	08/27/14 22:19
7440-66-6	Zinc	9.24	3.46	6.92	13.8	2	D2	SW6010C	4H19023	08/29/14 13:04

ANALYSIS DATA SHEET

VWW06-SD045-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc
Matrix: Solid
Sampled: 07/31/14 09:25
% Solids: 27.10

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-05
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	731	1.18	2.31	3.84	1	J DT	SW6010C	4H19023	08/27/14 22:23
7440-66-6	Zinc	1110	3.84	7.69	15.4	1	J DT	SW6010C	4H19023	08/27/14 22:23

ANALYSIS DATA SHEET

VWW06-SD045-2430

Laboratory:	Empirical Laboratories, LLC	SDG:	1408016
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408016-06
Sampled:	07/31/14 09:30	Received:	08/05/14 08:50
% Solids:	70.87		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.23	0.411	0.822	1.37	1	J	SW6010C	4H19023	08/27/14 22:26
7440-66-6	Zinc	2.98	2.74	5.48	11.0	2	DJ	SW6010C	4H19023	08/29/14 12:09

spc 10/9/14

073

ANALYSIS DATA SHEET

VWW06-SD045-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 09:35
% Solids: 56.20

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-07
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.08	0.562	1.12	1.87	1	J	SW6010C	4H19023	08/27/14 22:32
7440-66-6	Zinc	5.33	3.75	7.49	15.0	2	BJ	SW6010C	4H19023	08/29/14 13:14

JLC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD045-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 09:40
% Solids: 60.01

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-08
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.50	0.515	1.03	1.72	1	J	SW6010C	4H19023	08/27/14 22:37
7440-66-6	Zinc	10.8	3.44	6.87	13.7	2	DJ	SW6010C	4H19023	08/29/14 13:18

JLC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD039-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 10:00
% Solids: 48.07

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-09
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	289	0.612	1.22	2.04	1	J DT	SW6010C	4H19023	08/27/14 22:41
7440-66-6	Zinc	478	2.04	4.08	8.16	1	J DT	SW6010C	4H19023	08/27/14 22:41

10/4/14

ANALYSIS DATA SHEET

VWW06-SD039-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 10:05
% Solids: 59.99

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-10
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.03	0.500	1.00	1.67	1	J	SW6010C	4H19023	08/27/14 22:46
7440-66-6	Zinc		3.33	6.67	13.3	2	U	SW6010C	4H19023	08/29/14 13:23

10/4/14

ANALYSIS DATA SHEET

VWW06-SD039-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 10:10
% Solids: 51.62

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-11
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.48	0.554	1.11	1.85	1	J	SW6010C	4H19023	08/27/14 22:51
7440-66-6	Zinc	8.79	3.69	7.38	14.8	2	DJ	SW6010C	4H19023	08/29/14 13:27

ANALYSIS DATA SHEET

VWW06-SD039-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 10:15
% Solids: 58.22

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-12
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	254	0.526	1.05	1.75	1		SW6010C	4H19023	08/27/14 23:08
7440-66-6	Zinc	291	1.75	3.51	7.01	1		SW6010C	4H19023	08/27/14 23:08

JJC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD038-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 10:50
% Solids: 48.59

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-13
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.88	0.611	1.22	2.04	1	J [illegible]	SW6010C	4H19023	08/27/14 23:13
7440-66-6	Zinc	10.7	4.08	8.15	16.3	2	J [illegible]	SW6010C	4H19023	08/29/14 13:32

JRC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD038-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 10:55
% Solids: 61.66

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-14
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	0.983	0.463	0.927	1.54	1	J	SW6010C	4H19023	08/27/14 23:17
7440-66-6	Zinc	3.51	3.09	6.18	12.4	2	QJ	SW6010C	4H19023	08/29/14 13:36

ANALYSIS DATA SHEET

VWW06-SD038-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc
Matrix: Solid
Sampled: 07/31/14 11:00
% Solids: 52.53

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-15
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.32	0.554	1.11	1.85	1	J	SW6010C	4H19023	08/27/14 23:22
7440-66-6	Zinc	5.86	3.70	7.39	14.8	2	DJ	SW6010C	4H19023	08/29/14 13:41

ANALYSIS DATA SHEET

VWW06-SD038-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 11:05
% Solids: 51.74

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-16
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.41	0.563	1.13	1.88	1	J	SW6010C	4H19023	08/27/14 23:26
7440-66-6	Zinc	12.8	3.75	7.51	15.0	2	BJ	SW6010C	4H19023	08/29/14 13:58

JEC 10/24/14

183

ANALYSIS DATA SHEET

VWW06-SD037-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 12:20
% Solids: 43.31

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-17
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	191	0.686	1.37	2.29	1	J QT	SW6010C	4H19023	08/27/14 23:31
7440-66-6	Zinc	264	2.29	4.57	9.14	1	J QT	SW6010C	4H19023	08/27/14 23:31

JLC 10/14/14

084

ANALYSIS DATA SHEET

VWW06-SD037-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 12:25
% Solids: 52.27

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-18
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.65	0.586	1.17	1.95	1	1	SW6010C	4H19012	08/22/14 15:49
7440-66-6	Zinc	6.08	1.95	3.90	7.81	1	1	SW6010C	4H19012	08/22/14 15:49

085

ANALYSIS DATA SHEET

VWW06-SD037-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 12:30
% Solids: 52.64

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-19
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.72	0.570	1.14	1.90	1	J	SW6010C	4H19023	08/27/14 23:36
7440-66-6	Zinc	10.4	3.80	7.60	15.2	2	DJ	SW6010C	4H19023	08/29/14 14:03

ANALYSIS DATA SHEET

VWW06-SD037-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 12:35
% Solids: 51.61

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-20
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.42	0.570	1.14	1.90	1	J	SW6010C	4H19023	08/27/14 23:40
7440-66-6	Zinc	8.85	3.80	7.60	15.2	2	BJ	SW6010C	4H19023	08/29/14 14:07

SDC 10/14/14

687

ANALYSIS DATA SHEET

VWW06-SD037P-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 07/31/14 12:40
% Solids: 54.53

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-21
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.68	0.550	1.10	1.83	1	J	SW6010C	4H19023	08/27/14 23:45
7440-66-6	Zinc	9.60	3.67	7.34	14.7	2	DJ	SW6010C	4H19023	08/29/14 14:12

JRC 10/9/14

ANALYSIS DATA SHEET

VWW06-EB01-080114

Laboratory: Empirical Laboratories, LLC
Client: CH2M HILL Inc.
Matrix: Water
Sampled: 08/01/14 06:30

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-22
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (ug/L)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead		1.50	3.00	5.00	1	U	SW6010C	4H13003	08/14/14 13:03
7440-66-6	Zinc		5.00	10.0	20.0	1	U	SW6010C	4H13003	08/14/14 13:03

ANALYSIS DATA SHEET

VWW06-SD036-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/01/14 08:40
% Solids: 48.33

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-23
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	167	1.24	2.48	4.14	2	J B OT	SW6010C	4H19024	08/29/14 14:48
7440-66-6	Zinc	188	4.14	8.28	16.6	2	J B OT	SW6010C	4H19024	08/29/14 14:48

JK 10/14/14

ANALYSIS DATA SHEET

VWW06-SD036-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/01/14 08:45
% Solids: 62.14

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-24
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.62	0.488	0.975	1.62	1	J	SW6010C	4H19011	08/22/14 13:29
7440-66-6	Zinc		3.25	6.50	13.0	2	U	SW6010C	4H19011	08/26/14 12:35

SAC 10/14/14

091

ANALYSIS DATA SHEET

VWW06-SD036-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/01/14 08:50
% Solids: 54.11

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-25
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.49	1.09	2.17	3.62	2	BJ	SW6010C	4H19024	08/29/14 14:52
7440-66-6	Zinc	9.21	3.62	7.25	14.5	2	BJ	SW6010C	4H19024	08/29/14 14:52

SPC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD035-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/01/14 09:35
% Solids: 41.61

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-27
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	84.6	1.47	2.94	4.91	2	J	SW6010C	4H19024	08/29/14 15:02
7440-66-6	Zinc	274	4.91	9.81	19.6	2	J	SW6010C	4H19024	08/29/14 15:02

10/14/14

ANALYSIS DATA SHEET

VWW06-SD035P-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/01/14 09:40
% Solids: 39.71

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-28
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	118	1.45	2.91	4.84	2	J B OT	SW6010C	4H19024	08/29/14 15:06
7440-66-6	Zinc	462	4.84	9.69	19.4	2	J B J	SW6010C	4H19024	08/29/14 15:06

JPC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD036-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/01/14 08:55
% Solids: 55.61

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-26
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.51	1.11	2.22	3.71	2	J1	SW6010C	4H19024	08/29/14 14:57
7440-66-6	Zinc	9.18	3.71	7.42	14.8	2	J1	SW6010C	4H19024	08/29/14 14:57

SJC 10/14/14

035

ANALYSIS DATA SHEET

VWW06-SD035-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/01/14 09:45
% Solids: 56.30

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU16
Laboratory ID: 1408016-29
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.46	1.01	2.03	3.38	2	BJ	SW6010C	4H19024	08/29/14 15:11
7440-66-6	Zinc	5.07	3.38	6.77	13.5	2	BJ	SW6010C	4H19024	08/29/14 15:11

ANALYSIS DATA SHEET

VWW06-SD035-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/01/14 09:50
% Solids: 56.62

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-30
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.29	1.07	2.14	3.57	2	J0	SW6010C	4H19024	08/29/14 15:15
7440-66-6	Zinc	7.50	3.57	7.14	14.3	2	J0	SW6010C	4H19024	08/29/14 15:15

ANALYSIS DATA SHEET

VWW06-SD035-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/01/14 09:55
% Solids: 56.34

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-31
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.55	1.02	2.05	3.41	2	DJ	SW6010C	4H19024	08/29/14 15:20
7440-66-6	Zinc	7.94	3.41	6.83	13.7	2	DJ	SW6010C	4H19024	08/29/14 15:20

DAC 12/11/14

ANALYSIS DATA SHEET

VWW06-SD034-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/01/14 10:30
% Solids: 32.79

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-32
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	104	1.79	3.39	5.98	2	J ~~B~~ J	SW6010C	4H19024	08/29/14 15:24
7440-66-6	Zinc	175	5.98	12.0	21.9	2	J ~~B~~ J	SW6010C	4H19024	08/29/14 15:24

SDC 10/14/14

099

ANALYSIS DATA SHEET

VWW06-SD034-2430

Laboratory:	Empirical Laboratories, LLC	SDG:	1408016
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408016-33
Sampled:	08/01/14 10:35	Received:	08/05/14 08:50
% Solids:	58.02		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	4.57	1.06	2.11	3.52	2	D	SW6010C	4H19024	08/29/14 15:29
7440-66-6	Zinc	17.3	3.52	7.04	14.1	2	D	SW6010C	4H19024	08/29/14 15:29

SAC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD034-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/01/14 10:40
% Solids: 51.80

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-34
Received: 08/05/14 08:30

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead		1.16	2.32	3.86	2	U	SW6010C	4H19024	08/29/14 15:46
7440-66-6	Zinc	9.49	3.86	7.72	15.4	2	J	SW6010C	4H19024	08/29/14 15:46

101

ANALYSIS DATA SHEET

VWW06-SD034-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/01/14 10:45
% Solids: 62.46

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-35
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.38	0.942	1.88	3.14	2	BJ	SW6010C	4H19024	08/29/14 15:51
7440-66-6	Zinc	12.9	3.14	6.28	12.6	2	B	SW6010C	4H19024	08/29/14 15:51

JLC 10/14/14

ANALYSIS DATA SHEET

VWW06-EB01-080414

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Water
Sampled: 08/04/14 07:00

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408016-36
Received: 08/05/14 08:50

CAS NO.	Analyte	Conc. (ug/L)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead		1.50	3.00	5.00	1	U	SW6010C	41113003	08/14/14 13:08
7440-66-6	Zinc		5.00	10.0	20.0	1	U	SW6010C	41113003	08/14/14 13:08

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ANALYSIS DATA SHEET

VWW08-SD036-2430

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc

Matrix: Solid

% Solids: 62.14

SDG: 1408016

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4111901J-DUP1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	ND	2.44	4.88	8.13	1	U	SW6010C	3119011	08/22/14 13:47

ANALYSIS DATA SHEET

VWW06-SD036-2430

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 62.14

SDG: 1408016

Project: NTR Vieques CTO 113 SWMU16

Laboratory ID: 4119011-DUP2

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	DF	Q	Method	Batch	Analyzed
7440-66-6	Zinc	ND	16.3	32.5	65.0	10	U	SW6010C	4119011	09/26/14 12:40

JAC 9/28/14

ANALYSIS DATA SHEET

VWW06-SD036-2430

Laboratory: Empirical Laboratories, LLC

Client: CH2M HILL Inc.

Matrix: Solid

% Solids: 62.14

SDG: 1408016

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4H19011-MS1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DI	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	91.46	0.493	0.985	1.64	1		SW6010C	4H19011	08/22/14 13:34
7440-66-6	Zinc	199.7	1.64	3.28	6.57	1		SW6010C	4H19011	08/22/14 13:34

JEC 82814

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ANALYSIS DATA SHEET

VWW06-SD036-2430

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 62.14

SDG: 1408016

Project: NTR Vieques CTO 113 SWMU6

Laboratory ID: 4H19011-MSD1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	89.91	0.498	0.995	1.66	1		SW6010C	4H19011	08/22/14 13:38
7440-66-6	Zinc	196.6	1.66	3.32	6.64	1		SW6010C	4H19011	08/22/14 13:38

JLC 8/28/14

ANALYSIS DATA SHEET

WWW05-SD037-2430

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 52.27

SDG: 1408016

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4H19012-DUP1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	ND	2.93	5.86	9.76	5	U	SW6010C	4H19012	08/22/14 16:08
7440-66-6	Zinc	ND	9.76	19.5	39.0	5	U	SW6010C	4H19012	08/22/14 16:08

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ANALYSIS DATA SHEET

VWW06-SD037-2430

Laboratory: Empirical Laboratories, LLC
SDG: 1408016
Client: CH2M Hill, Inc.
Project: NTR Vieques CTO 117 SW8016
Matrix: Solid
Laboratory ID: 4H19012-MS1
% Solids: 52.27

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	166.9	0.586	1.13	1.95	1		SW6010C	4H19012	08/22/14 15:54
7440-66-6	Zinc	231.5	1.95	3.90	5.81	1		SW6010C	4H19012	08/22/14 15:54

8/28/14

ANALYSIS DATA SHEET

VWW06-SD037-2430

Laboratory: Empirical Laboratories LLC
Client: CH2M Hill, Inc
Matrix: Solid
% Solids: 52.27

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 4H19012-MS01

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	104.1	0.580	1.16	1.93	1		SW6010C	4H19012	08/22/14 15:58
7440-66-6	Zinc	226.0	1.93	3.86	7.73	1		SW6010C	4H19012	08/22/14 15:58

SAC 8/28/14

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ANALYSIS DATA SHEET

VWW06-SD044-2430

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 64.11

SDG: 1408016

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4H19013-DUP1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	ND	2.54	4.68	8.80	5	U	SW6010C	4H19013	08/26/14 16:06
7440-66-6	Zinc	ND	7.80	15.6	31.2	5	U	SW6010C	4H19013	08/26/14 16:06

ANALYSIS DATA SHEET

VWW05-SD044-2430

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 64.11

SDG: 1408016

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4H19013-MS1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	78.16	0.459	0.918	1.53	1		SW6010C	4H19013	08/26/14 15:52
7440-66-6	Zinc	171.5	1.53	3.06	6.12	1		SW6010C	4H19013	08/26/14 15:52

82814

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ANALYSIS DATA SHEET

WWW06-SD044-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
% Solids: 64.11

SDG: 1408016
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 4H19013-MSD1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	84.02	0.487	0.973	1.62	1		SW6010C	4H19013	08/26/14 15:57
7440-66-6	Zinc	183.4	1.62	3.23	6.50	1		SW6010C	4H19013	08/26/14 15:57

JLC 8/28/14

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Sample Delivery Group Case Narrative

Receipt Information:

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision:

Revision 01: The package was revised to replace the "matrix spike", "matrix spike duplicate", and "duplicate" on the Analysis Data Sheets with the client ID of the parent sample at the request of the client.

Analytical Information:

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. Sample preparation and dilution information is provided within the final results report and at the beginning of each form set. The following information is provided specific to individual methods:

SW8082B:

Note – Samples 1408016-01, -02, -05, -06, -09, -10, -13, and -17 were re-analyzed as 1408016-01RE1, -02RE1, -05RE1, -06RE1, -09RE1, -10RE1, -13RE1, and -17RE1 due to sulfur interference in the original analyses. Only the re-analyses are included in the report.

The following were extracted after the method recommended holding time of 14 days:
1408016-07RE1, -14RE1, and -16RE1 were extracted 27 days after sampling
1408016-28RE1 and -32RE1 were extracted 28 days after sampling
1408016-09RE2, -13RE2, and -17RE2 were extracted 29 days after sampling
Note – The samples were re-extracted due to surrogate exceedences.

The following surrogates exceeded criteria:
Tetrachloro-m-xylene with a negative bias on both columns in 1408016-07, -07RE1, -09RE1, -13RE1, -16, -17RE1, -27, -28, -30, -32, -34, -35, and 4H26005-MSD1 and with a negative bias on column 1 in 1408016-10RE1, -14, -25, -26, -29, -31, and -33
Decachlorobiphenyl with a negative bias on both columns in 1408016-03, -07, -07RE1, -09RE1, -11, -13RE1, -14, -14RE1, -15, -16, -16RE1, -17RE1, -22, -28, and -32

Note – Samples 1408016-07, -09RE1, -13RE1, -14, -16, -17RE1, -28, and -32 were re-extracted since 3 or more surrogates exceeded criteria with a negative bias. Both are included in the report. Samples with less than 3 surrogates exceeding criteria were not re-extracted.

The following continuing calibration verifications exceeded criteria:
4H23711-CCV9 with a negative bias on both columns for Decachlorobiphenyl; note – no surrogates were biased into or out of control due to the exceedences

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

SW6010C:
The following post spikes exceeded criteria:
4H19011-PS1 (1408016-24) with a positive bias for Zinc
4H19012-PS1 (1408016-18) with a positive bias for Zinc
Note – The associated batch spike and matrix spikes are within criteria.

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

Data Qualifiers:
As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

DL: The detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is supported by the method detection limit (MDL) which is determined from analysis of a sample containing the analyte in a given matrix.

LOD: The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM 4.2 revisions as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

LOQ: The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM 4.2 as the lowest concentration that produces a quantitative result within specified limits of precision and bias.

***:** Exceeding quality control criteria are associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. For Metals, the qualifier indicates that the serial dilution was outside of the control limits and the compound should be considered estimated due to the presence of interference.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time.

H3: The sample for this analyte was received outside of the EPA recommended holding time.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the LOQ. One should feel confident that the result is greater than zero and less than the LOQ.

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it indicates that the parameters DL/LOD/LOQ have been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The relative percent difference (RPD) and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

S: The associated internal standard exceeded criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

Z: The parameter shows lack of confirmation/detection, which may be due to a negative bias in the ICV or CCV which exceeds the lower control limit.

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.

B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.

C: The peak was manually integrated to correct the baseline from the original chromatogram.

D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.

E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

LIMS Definitions / Naming Conventions:

The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK

appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And **"RE"** implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, the Data Quality Manager, Technical Directors or Project Managers are authorized to sign this Statement of Data Authenticity.

Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

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1408016

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

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23287

Page 1 of 3

Send Results to:	Send Invoice to:
Name Juliana Dean	Name SAME
Company CH2M Hill	Company
Address 5701 Cleveland St Suite 200	Address
City Virginia Beach	City
State, Zip Virginia 23462	State, Zip
Phone 757 671 6232	Phone
Fax	Fax
E-mail juliana.dean@ch2m.com	E-mail
Project No./Name: 433193, Ft. Fk. 56 / Samuels	Sampler's (Signature):

Analysis Requirements: Metals 6010C; PCB 8082A

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres.
01	7/31/2014 0835	VWW06-SD044-0006	SD	✓	✓		2	
02	7/31/2014 0840	VWW06-SD044-2430	SD	✓	✓		2	
↓	7/31/2014 0840	VWW06-SD044-2430-MS	SD	✓	✓		2	
↓	7/31/2014 0840	VWW06-SD044-2430-SD	SD	✓	✓		2	
03	7/31/2014 0845	VWW06-SD044-4854	SD	✓	✓		2	
04	7/31/2014 0850	VWW06-SD044-7278	SD	✓	✓		2	
05	7/31/14 0925	VWW06-SD045-0006	SD	✓	✓		2	
06	7/31/14 0930	VWW06-SD045-2430	SD	✓	✓		2	
07	7/31/14 0935	VWW06-SD045-4854	SD	✓	✓		2	
08	7/31/14 0940	VWW06-SD045-7278	SD	✓	✓		2	
09	7/31/14 1000	VWW06-SD039-0006	SD	✓	✓		2	
10	7/31/14 1005	VWW06-SD039-2430	SD	✓	✓		2	

Relinquished by: (Signature)	Date/Time	Received By: (Signature)
	8/1/14 0715	
Relinquished by: (Signature)	Date/Time	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time: 0850 8/5/14	Temperature: 0.7, 0.1, -0.5

REMARKS:

Details:

Page ____ of ____

Cooler No. ____ of ____

Date Shipped ____

Shipped By ____

Turnaround ____

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1408016

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23283

Send Results to:
Name Juliana Dean
Company CH2M Hill
Address 5701 Cleveland St Ste 285
City Virginia Beach
State, Zip Virginia 23462
Phone 757 671 6232
Fax
E-mail julianadean@ch2m.com

Send Invoice to:
Name SAME
Company
Address
City
State, Zip
Phone
Fax
E-mail

Project No./Name: 433193.F1.FK.S6/SLMU6

Sampler's (Signature):

Analysis Requirements: Metals 6010C; PCB 8082A

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres.
11	7/31/14 1010	VWW06-SD039-4854	SD	✓	✓		2	
12	7/31/14 1015	VWW06-SD039-7278	SD	✓	✓		2	
13	7/31/14 1050	VWW06-SD038-0006	SD	✓	✓		2	
14	7/31/14 1055	VWW06-SD038-2430	SD	✓	✓		2	
15	7/31/14 1100	VWW06-SD038-4854	SD	✓	✓		2	
16	7/31/14 1105	VWW06-SD038-7278	SD	✓	✓		2	
17	7/31/14 1220	VWW06-SD037-0006	SD	✓	✓		SD 2	4°
18	7/31/14 1225	VWW06-SD037-2430	SD	✓	✓		2	
↓	7/31/14 1225	VWW06-SD037-2430-MS	SD	✓	✓		2	
↓	7/31/14 1225	VWW06-SD037-2430-SD	SD	✓	✓		2	
19	7/31/14 1230	VWW06-SD037-4854	SD	✓	✓		2	
20	7/31/14 1235	VWW06-SD037-7278	SD	✓	✓		2	

Relinquished by: (Signature)	Date/Time:	Received By: (Signature)
	8/1/14 0715	
Relinquished by: (Signature)	Date/Time:	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time:	Temperature:
	8/5/14 0850	0.7, -0.1, 0.5

REMARKS:

Details:
Page ____ of ____
Cooler No ____ of ____
Date Shipped
Shipped By
Turnaround

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

1408016

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23224

Send Results to:
Name: Juliana Dean
Company: CH2M Hill
Address: 5101 Cleveland St Suite 200
City: Virginia Beach
State, Zip: VA 23462
Phone: 757 671 6232
Fax:
E-mail: juliana.dean@ch2m.com

Send Invoice to:
Name: SAME
Company:
Address:
City:
State, Zip:
Phone:
Fax:
E-mail:

Project No./Name: 433193.F1.FK.S6/SWMU6

Sampler's (Signature):

Analysis Requirements: Metals 6010C; PCB 8082A

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No of Bottles	Lab Use Only Containers/Pres
21	7/31/14 1240	VWW06-SD-37R-7278	SD	✓	✓		2	
22	8/1/14 0630	VWW06-EB01-080114	AQ	✓	✓		~~2~~ 3	

Relinquished by: (Signature)	Date/Time:	Received By: (Signature)
	8/1/14 0715	
Relinquished by: (Signature)	Date/Time:	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time: 0850	Temperature:
	8/5/14	0.7, -0.1, -0.5

REMARKS:

Details:
Page ___ of ___
Cooler No ___ of ___
Date Shipped
Shipped By
Turnaround

Distribution: Original and yellow copies accompany sample shipment to laboratory. Pink retained by samplers.

1408016

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Send Results to:	Send Invoice to:
Name Juliana Dean	Name SAME
Company CH2M Hill	Company
Address 5701 Cleveland St Suite 200	Address
City Virginia Beach	City
State, Zip VA 23462	State, Zip
Phone 757 671 6232	Phone
Fax	Fax
E-mail juliana.dean@ch2m.com	E-mail
Project No./Name:	Sampler's (Signature):

Analysis Requirements: Metals 6010C; PCB 8082A

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres.
23	8/1/14 0840	VWW06-SD036-0006	SD	✓	✓		2	
24	8/1/14 0845	VWW06-SD036-2430	SD	✓	✓		2	
↓	8/1/14 0845	VWW06-SD036-2430-MS	SD	✓	✓		2	
↓	8/1/14 0845	VWW06-SD036-2430-SD	SD	✓	✓		2	
25	8/1/14 0850	VWW06-SD036-4854	SD	✓	✓		2	
26	8/1/14 0855	VWW06-SD036-7278	SD	✓	✓		2	
27	8/1/14 0935	VWW06-SD035-0006	SD	✓	✓		2	
28	8/1/14 0940	VWW06-SD035P-0006	SD	✓	✓		2	
29	8/1/14 0945	VWW06-SD035-2430	SD	✓	✓		2	
30	LB 8/1/14 0950	VWW06-SD035-4854	SD	✓	✓		2	
31	8/1/14 0955	VWW06-SD035-7278	SD	✓	✓		2	
32	8/1/14 1030	VWW06-SD034-0006	SD	✓	✓		2	

Relinquished by: (Signature)	Date/Time	Received By: (Signature)
[signature]	8/4/14 0715	
Relinquished by: (Signature)	Date/Time	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time	Temperature:
[signature]	0850 8/5/15	0.7-0.1, -0.5

REMARKS

Details:

Page ____ of ____

Cooler No. ____ of ____

Date Shipped ____

Shipped By ____

Turnaround ____

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

1408016

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

2328R

SHIP TO: 621 Mainstream Drive, Suite 270 ♦ Nashville, TN 37228 ♦ 877-345-1113 ♦ (fax) 866-417-0548

Send Results to:	Send Invoice to:
Name Juliana Dean	Name SAME
Company CH2M Hill	Company
Address 5701 Cleveland St. Suite 200	Address
City Virginia Beach	City
State, Zip VA 23462	State, Zip
Phone 757 671 6232	Phone
Fax	Fax
E-mail juliana.dean@ch2m.com	E-mail
Project No./Name:	Sampler's (Signature):

Analysis Requirements: Metals 6010C; PCB 8082A

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres.
33	8/1/14 1035	VWW06-SD034-2430	SD	✓	✓		2	
34	8/1/14 1040	VWW06-SD034-4854	SD	✓	✓		2	
35	8/1/14 1045	VWW06-SD034-7278	SD	✓	✓		2	
36	8/4/14 0700	VWW06-EB01-080414	AQ	✓	✓		3	

Relinquished by: (Signature)	Date/Time:	Received By: (Signature)
[signature]	8/4/14 0705	
Relinquished by: (Signature)	Date/Time:	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time:	Temperature:
[signature]	8/5/14 0850	0.7, -0.1, -0.5

REMARKS:

Details:

Page ____ of ____

Cooler No ____ of ____

Date Shipped ____

Shipped By ____

Turnaround ____

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 08/05/14 0850 Workorder# 1408016

1. Tracking # 637 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: 1.0 °C + correction factor (-0.3) = 0.7 °C

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO (NA)

4. Were custody seals on outside of cooler? (YES) NO NA

   If yes, how many and where: 2, front + back

5. Were the seals intact, signed, and dated correctly? (YES) NO NA

6. Were custody papers inside cooler? (YES) NO NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) JTG 8/5/14

7. Were custody seals on containers: YES (NO) and intact YES NO (NA)

   Were these signed and dated correctly? YES NO (NA)

8. Packing material used: (Bubblewrap) (Plastic bag) Peanuts Vermiculite Foam insert Paper Other None

9. Cooling process: (Ice) Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES) NO NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES) NO NA

12. Did all container labels and tags agree with custody papers? (YES) NO NA

13. a. Were VOA vials received? YES (NO) NA

    b. Was there any observable headspace present in any VOA vial? YES NO (NA)

14. Was there a Trip Blank in this cooler? YES (NO) NA If multiple coolers, sequence # 1

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) JTG 8/5/14

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? (YES) NO NA

    b. Did the bottle labels indicate that the correct preservatives were used (YES) NO NA

16. Was residual chlorine present? YES NO (NA)

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) JTG 8/5/14

17. Were custody papers properly filled out (ink, signed, etc)? (YES) NO NA

18. Did you sign the custody papers in the appropriate place? (YES) NO NA

19. Were correct containers used for the analysis requested? (YES) NO NA

20. Was sufficient amount of sample sent in each container? (YES) NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial/date) JTG 8/5/14

I certify that I attached a label with the unique LIMS number to each container (initial/date) JTG 8/5/14

I certify that I have performed a second check of the LIMS information against the COC to confirm accuracy (initial/date) _____

21. Were there Non-Conformance issues at login? YES (NO) Was a NCR generated? YES (NO) # _____

Additional Details:

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 08/05/14 0850 Workorder# 1708016

1. Tracking # 5606 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: 0.2 °C + correction factor (-0.3) = -0.1 °C

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES (NO) NA

4. Were custody seals on outside of cooler? (YES) NO NA

   If yes, how many and where: 2, front + back

5. Were the seals intact, signed, and dated correctly? (YES) NO NA

6. Were custody papers inside cooler? YES (NO) NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) JTG 8/5/14

7. Were custody seals on containers: YES (NO) and intact YES NO (NA)

   Were these signed and dated correctly? YES NO (NA)

8. Packing material used? (Bubblewrap) Plastic bag Peanuts Vermiculite Foam insert Paper Other None

9. Cooling process: (Ice) Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES) NO NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES) NO NA

12. Did all container labels and tags agree with custody papers? (YES) NO NA

13. a. Were VOA vials received? YES (NO) NA

    b. Was there any observable headspace present in any VOA vial? YES NO (NA)

14. Was there a Trip Blank in this cooler? YES (NO) NA If multiple coolers, sequence # 2

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) JTG 8/5/14

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? (YES) NO NA

    b. Did the bottle labels indicate that the correct preservatives were used (YES) NO NA

16. Was residual chlorine present? YES NO (NA)

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) JTG 8/5/14

17. Were custody papers properly filled out (ink, signed, etc)? (YES) NO NA

18. Did you sign the custody papers in the appropriate place? (YES) NO NA

19. Were correct containers used for the analysis requested? (YES) NO NA

20. Was sufficient amount of sample sent in each container? (YES) NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial/date) JTG 8/5/14

I certify that I attached a label with the unique LIMS number to each container (initial/date) JTG 8/5/14

I certify that I have performed a second check of the LIMS information against the COC to confirm accuracy (initial/date)

21. Were there Non-Conformance issues at login? YES (NO) Was a NCR generated? YES (NO) #

Additional Details:

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 08/05/14 0850 Workorder# 1405016

1. Tracking # 9461 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: -0.2 °C + correction factor (-0.3) = -0.5 °C

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES (NO) NA

4. Were custody seals on outside of cooler? (YES) NO NA

   If yes, how many and where: 2. Front & back

5. Were the seals intact, signed, and dated correctly? (YES) NO NA

6. Were custody papers inside cooler? (YES) NO NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) JTG 8/5/14

7. Were custody seals on containers: YES (NO) and intact YES NO (NA)

   Were these signed and dated correctly? YES NO (NA)

8. Packing material used? (Bubblewrap) (Plastic bag) Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: (Ice) Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES) NO NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES) NO NA

12. Did all container labels and tags agree with custody papers? (YES) NO NA

13. a. Were VOA vials received? YES (NO) NA

    b. Was there any observable headspace present in any VOA vial? YES NO (NA)

14. Was there a Trip Blank in this cooler? YES (NO) NA If multiple coolers, sequence # 3

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) JTG 8/5/14

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES NO (NA)

    b. Did the bottle labels indicate that the correct preservatives were used YES NO (NA)

16. Was residual chlorine present? YES NO (NA)

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) JTG 8/5/14

17. Were custody papers properly filled out (ink, signed, etc)? (YES) NO NA

18. Did you sign the custody papers in the appropriate place? (YES) NO NA

19. Were correct containers used for the analysis requested? (YES) NO NA

20. Was sufficient amount of sample sent in each container? (YES) NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial/date) JTG 8/5/14

I certify that I attached a label with the unique LIMS number to each container (initial/date) JTG 8/5/14

I certify that I have performed a second check of the LIMS information against the COC to confirm accuracy (initial/date)

21. Were there Non-Conformance issues at login? YES (NO) Was a NCR generated? YES (NO) #

Additional Details:

Holding Times

Sampling Date: 7/31, 8/1, 8/4
Received Date: 8/5/14
Extraction Date: 8/8, 8/11, 8/27 & 8/29 – PCBs
Analysis Dates: 8/11-8/12, 8/21, 8/26, 8/29, 9/5 – PCBs

The samples in this SDG were validated according to the recommendations in the Region II SOP NO. HW-47 Rev 3, 5/2013 and the QC limits published in the project specific SAP.

Receipt paperwork was in order. Cooler temperatures were acceptable. A seven-day holding time was used for the water samples and a fourteen-day holding time was used for the soil samples. The analysis holding time of 40 days was used. Based on this, all extraction and analysis holding times were met with the exception of several samples that were re-extracted due to non-compliant surrogate recoveries or sulfur interference. Most of these samples were excluded based on exceeded holding time criteria. Samples VWW06-SD045-4854 RE1, VWW06-SD039-0006 RE2, VWW06-SD038-2430 RE1, VWW06-SD038-7278 RE1, VWW06-SD035P-006 RE1, and VWW06-SD034-0006 RE1, which were re-extracted 13-15 days outside the holding time, are excluded in favor of the results reported from the analyses reported from the initial extractions.

One sample, VWW06-EB01-080114, was extracted 1 day outside the holding time. Results reported in this sample are qualified as estimated J/UJ.

Samples VWW06-SD037-0006 RE1 and VWW06-SD038-0006 RE1 are excluded in favor of the results reported in the RE2 extractions of the samples. These samples are not outside of the holding times but the RE2 results are significantly different. Samples VWW06-SD038-0006 RE2 and VWW06-SD037-0006 RE2 are qualified as estimated J/UJ based on exceeded holding times. These samples were reported rather than the original analyses because the surrogate recoveries were acceptable and the AR1254 was reported in the extracts. The original extracts exhibited very low surrogate recoveries and no positive results for AR1254. It is the professional opinion of the validator that the original extract results may reflect false non-detect results for AR1254.

All samples exhibited percent solids values >30% with the exception of sample VWW06-SD045-0006. Results in this sample were qualified as estimated J/UJ as required based on the Region II requirements.

Eight samples were reanalyzed within holding time due to sulfur interference in the original analyses runs. The laboratory did not submit the runs exhibiting the interferences. There is no impact based on this issue.

Calibrations

8082 PCB: Initial calibrations were performed according to the method with a six-point curve for AR1016, AR1242, AR1254, & AR1260 as the representative PCBs. Response factors were calculated. %RSDs were within QC limits. All ICV criteria were met (avg. %Ds were met). Continuing calibration standards were analyzed appropriately (for 1016, 1242 & 1260). All CCVs exhibited acceptable %Ds (avg. %Ds were met). Column resolution was acceptable. Retention times were stable throughout the analytical sequences. The correct analytical sequences were run. Raw data and calculations were verified.

Blank Summary

Blank qualification guidelines:

- No action is taken if a compound is found in the blank but not in the sample.
- Any compound detected in the sample, and the associated blank, must be qualified by reporting the result in the sample as non-detect at the LOD when the sample concentration is less than LOD.
- Sample weight, volume or dilution factor must be taken into consideration when applying the qualification criteria.
- Apply the same data validation guidelines to any associated rinse and field blanks and all associated samples.
- Qualification/Action codes:
  - No Action - The sample result is greater than the LOD and greater than five times (5X) the blank value.
  - U at LOD- The sample result is less than the LOD when the blank contamination level is less than the LOD.

Professional judgment is applied when blank concentrations are >LOD. Results may be flagged as U at the reported concentration or rejected. No contamination that resulted in qualification of the data was noted in the associated method or instrument blanks or the submitted field QC blanks.

Blank ID	Compound	Concentration	Action Level	Q Flag
no contamination was noted				

Surrogate Recoveries

Surrogate recoveries did not meet criteria in many of the samples in this SDG. Samples VWW06-EB01-080114, VWW06-SD035-4854, VWW06-SD044-4854, VWW06-SD045-4854, VWW06-SD035-0006, VWW06-SD035P-0006, VWW06-SD034-0006, VWW06-SD034-4854, VWW06-SD034-7278, VWW06-SD039-4854, VWW06-SD038-2430, VWW06-SD038-4854, VWW06-SD038-7278, and VWW06-SD039-0006 RE1 are qualified as estimated J-/UJ due to low surrogate recoveries.

Matrix Spike/Matrix Spike Duplicates

The MS/MSD samples analyzed for this SDG were acceptable for all recoveries and RPDs. No qualifications were required.

Laboratory Control Samples

The LCS samples exhibited acceptable recoveries. No qualifications were required.

Field Duplicate Sample Summary

There were two field duplicate pairs in this SDG. Qualifications were necessary in one of the field duplicate pairs. See the worksheet following this page for details.

Sample Result Verification

Reported sample results were verified. Raw data and calculations were verified.

Reviewer: Jacqueline Cleveland Date: 10/28/14

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD037-7278
Duplicate Sample ID: VWW06-SD037P-7278

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: no positive results reported in either sample.

Sample ID: VWW06-SD035-0006
Duplicate Sample ID: VWW06-SD035P-0006

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
Total PCBs	28.4	41.7	38
AR1254	28.4	41.7	38
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: Flag the positive results as estimated in the field duplicate pair.

Initial Calibration Date: 7/24-25-14, Instrument GL-ECD3

RRF and %RSD Calculations:

Compound Name: Cal3 at 750/75, Std. 14G0434, AR1660 peak 2 in level 3
Lab Value: 2054.3000

Area of Compound	1540725
Conc. of Compound	750
Calculated CF	2054.300

Compound Name: AR1260 Peak 2
Lab Value: 6.4

CF of STD 1	1883.529
CF of STD 2	1962.644
CF of STD 3	2054.300
CF of STD 4	2133.612
CF of STD 5	2036.520
CF of STD 6	2259.440
CF of STD 7	
CF of STD 8	
Calculated % RSD	6.39

Continuing Calibration File ID: 8/6/14, 1953, AR1260 Peak 4

RRF and %D Calculations:

Compound Name: AR1260, peak 4
Lab Value: 1908.9860

Area of Compound	1908986
Conc. of Compound	1000
Calculated CF	1908.986

Compound Name: AR1260, peak 4
Lab Value: 3.0

Average CF	1852.887
CF of CCV	1908.986
Calculated % D	-3.0

SAMPLE CALCULATION - SDG 1408016

Sample ID: VWW06-SD053-0006
Standard ID: ICAL 7/24-25/14
Compound: AR1260
Concentration: 101 ug/Kg (average of 3 peaks)
Calculation shows Peak 1: 67.55 ug/Kg

	Water (ug/L)	Soil (ug/Kg)
Area of Compound		197040
CF of Compound		1891.115
Final Volume		5
Dilution Factor		1
Split Factor		1
Injection Volume		1
Weight of Sample	na	15.2
Initial Volume of Sample		NA
Conversion Factor		1
Percent Solids Factor		0.5074
Concentration	#DIV/0!	67.54799

Peak #	Concentration
1	67.55
2	167
3	68.39
4	
5	
Total	**100.98**

Data File: \\EMPIRNSH01\TARGET_DATA\chem\ecd3.i\082514.b\030F3001.D

Date : 25-AUG-2014 20:49

Client ID:

Sample Info: 1408016-13RE1

Column phase: Agilent DB-CLP1

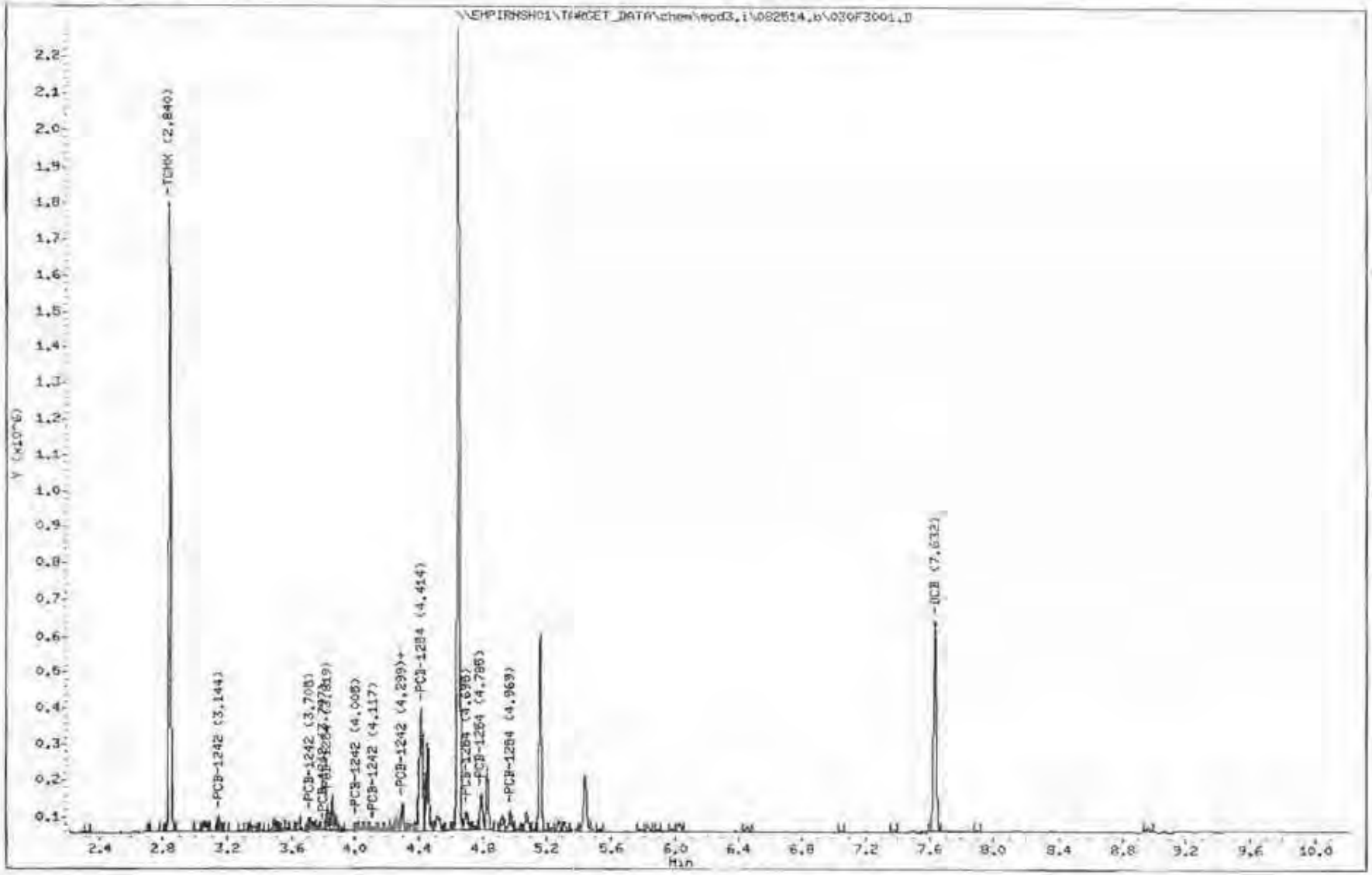
VLAW06-SB038-0006 RE1
very low surrogates

Instrument: ecd3.i

Operator:

Column diameter: 0.32

132
879



1408016

Data File: \\EMPIRNSH01\TARGET_DATA\chem\ecd3.i\090414.b\058F5801.D

Date : 05-SEP-2014 02:59

Client ID:

Sample Info: 1408016-13RE2

Column phase: Agilent DB-CLP1

Page 3

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1027

Vwuky-50038-0006RE2

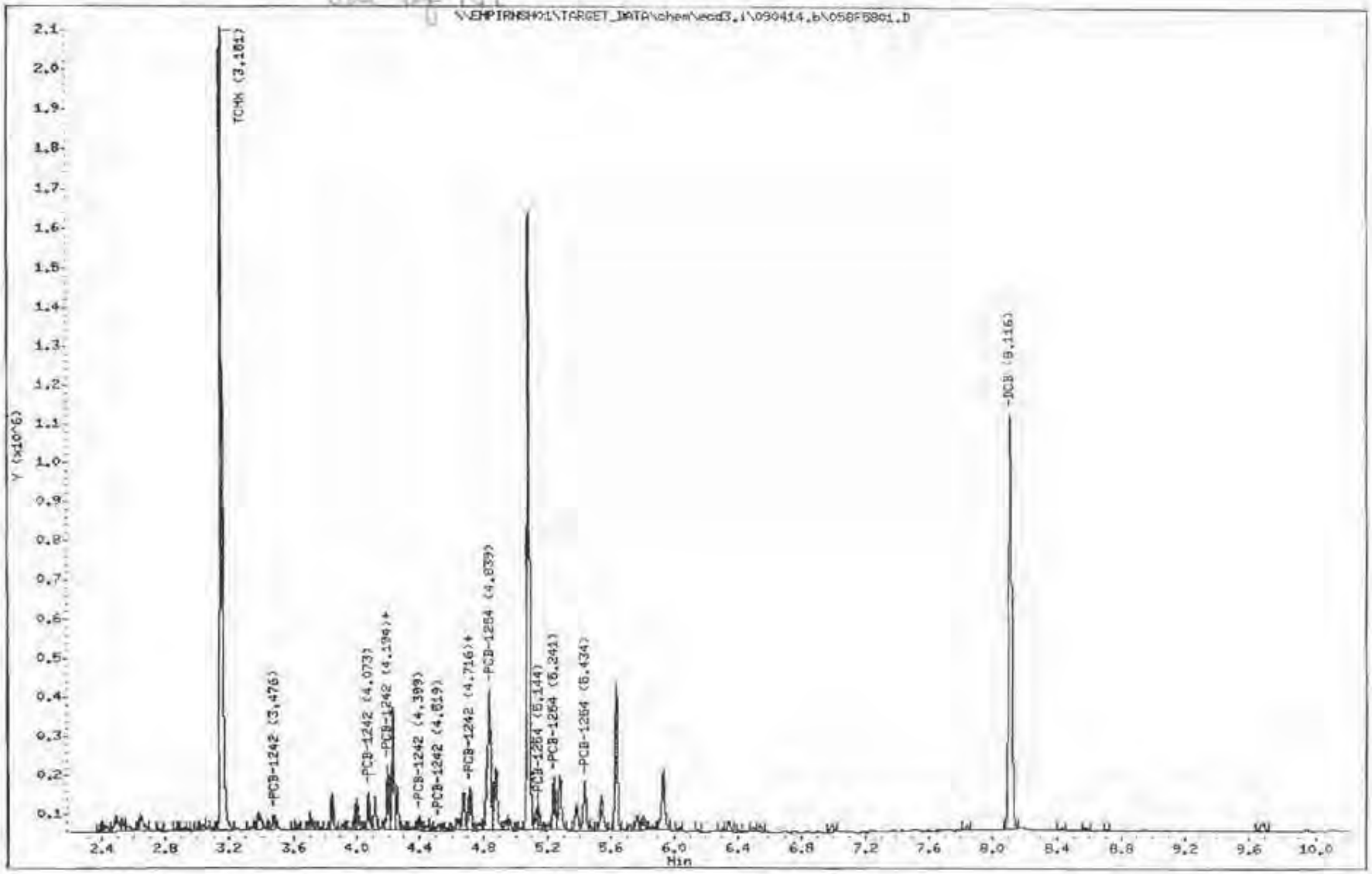
acceptable Surrogates

out of HT

Instrument: ecd3.i

Operator:

Column diameter: 0.32



1408016

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Date : 06-SEP-2014 02:59

Client ID:

Sample Info: 1408016-13RE2

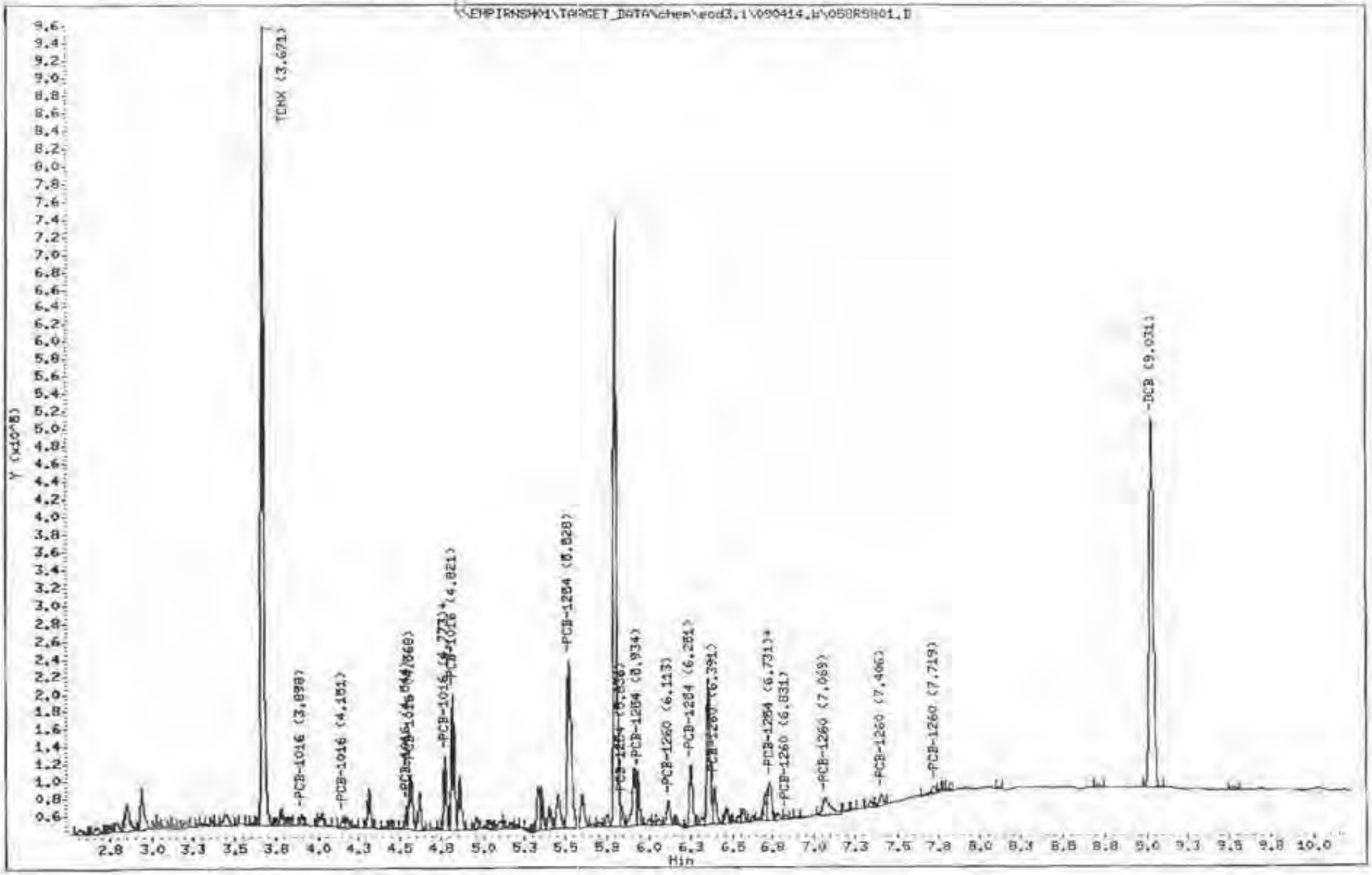
Column Phase: Agilent DB-CLP2

Instrument: ecd3.i

Operator:

Column diameter: 0.32

Page 1



1408016

134

1028

Data File: \\EMPIRNSH01\TARGET_DATA\chem\ecd3.i\082514.b\031F3101.D

Date : 25-AUG-2014 21:04

Client ID:

Sample Info: 1408016-17RE1

Column phase: Agilent DB-CLP1

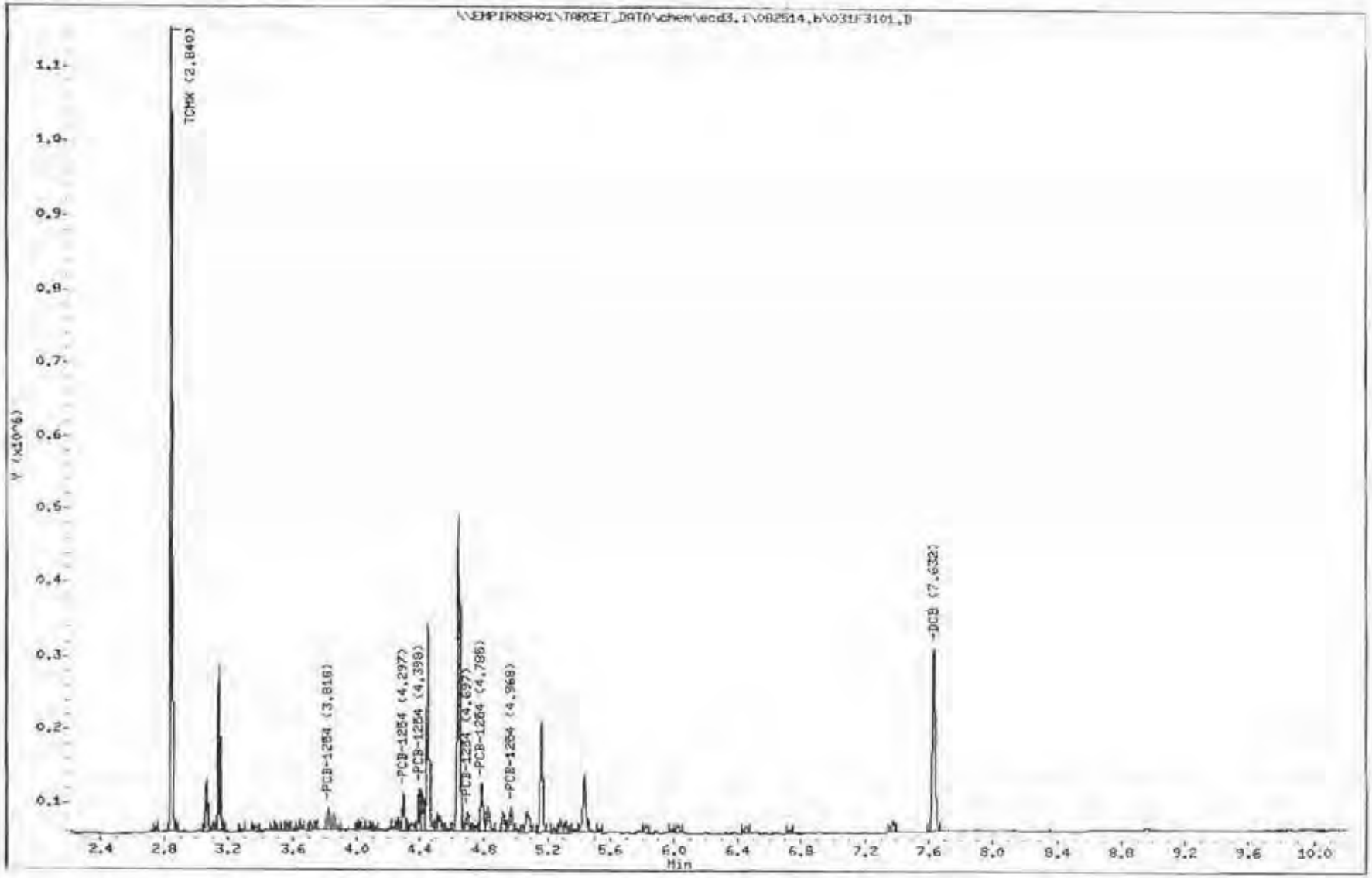
VWWOG-SD037-GCGRE1

very low surrogates

Instrument: ecd3.i

Operator:

Column diameter: 0.32



1408016

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Date : 05-SEP-2014 03:14

Client ID:

Sample Info: 1408016-17RE2

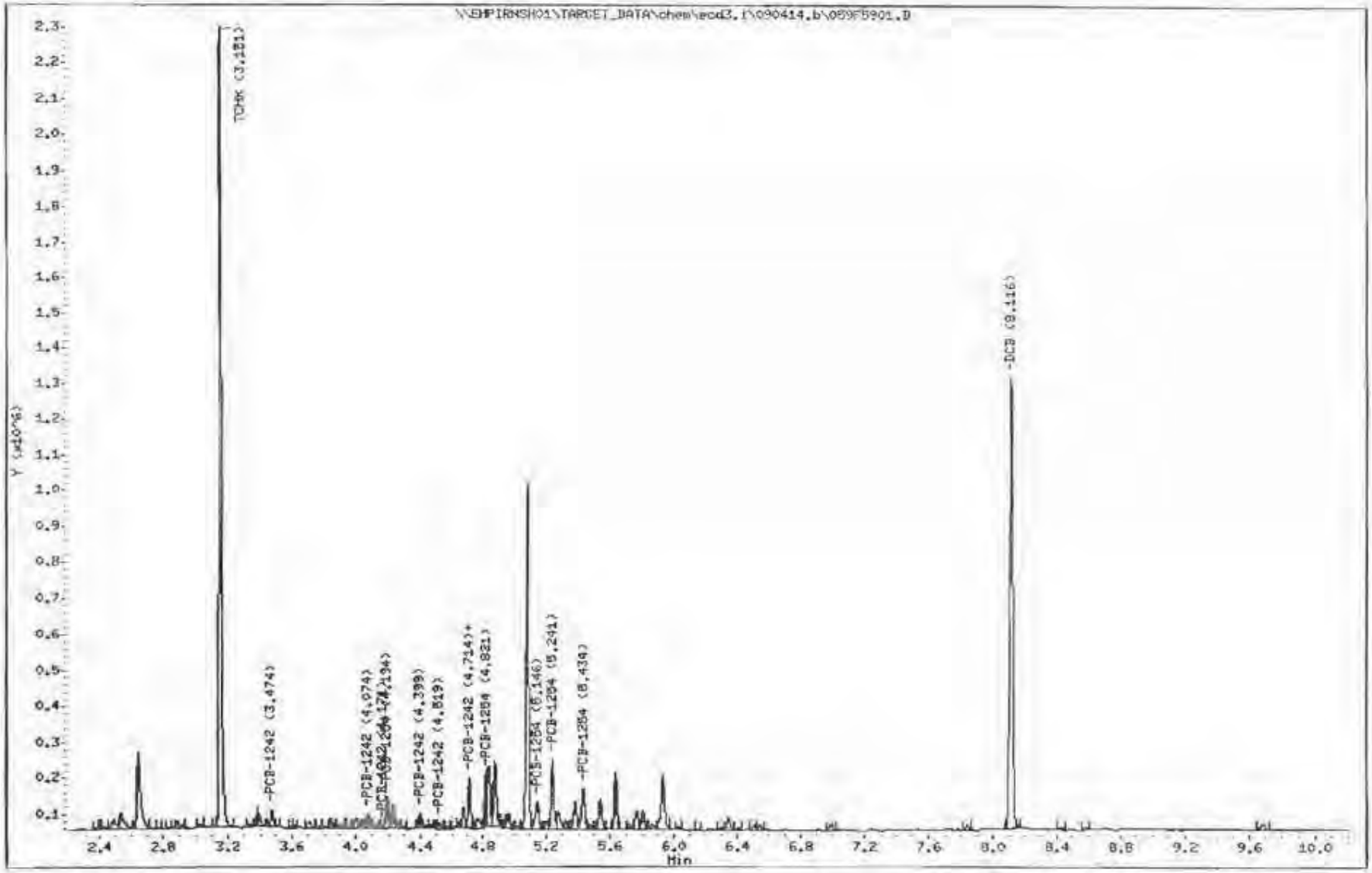
Column phase: Agilent DB-CLP1

Instrument: ecd3.i

Operator:

Column diameter: 0.32

Page 3



1408016

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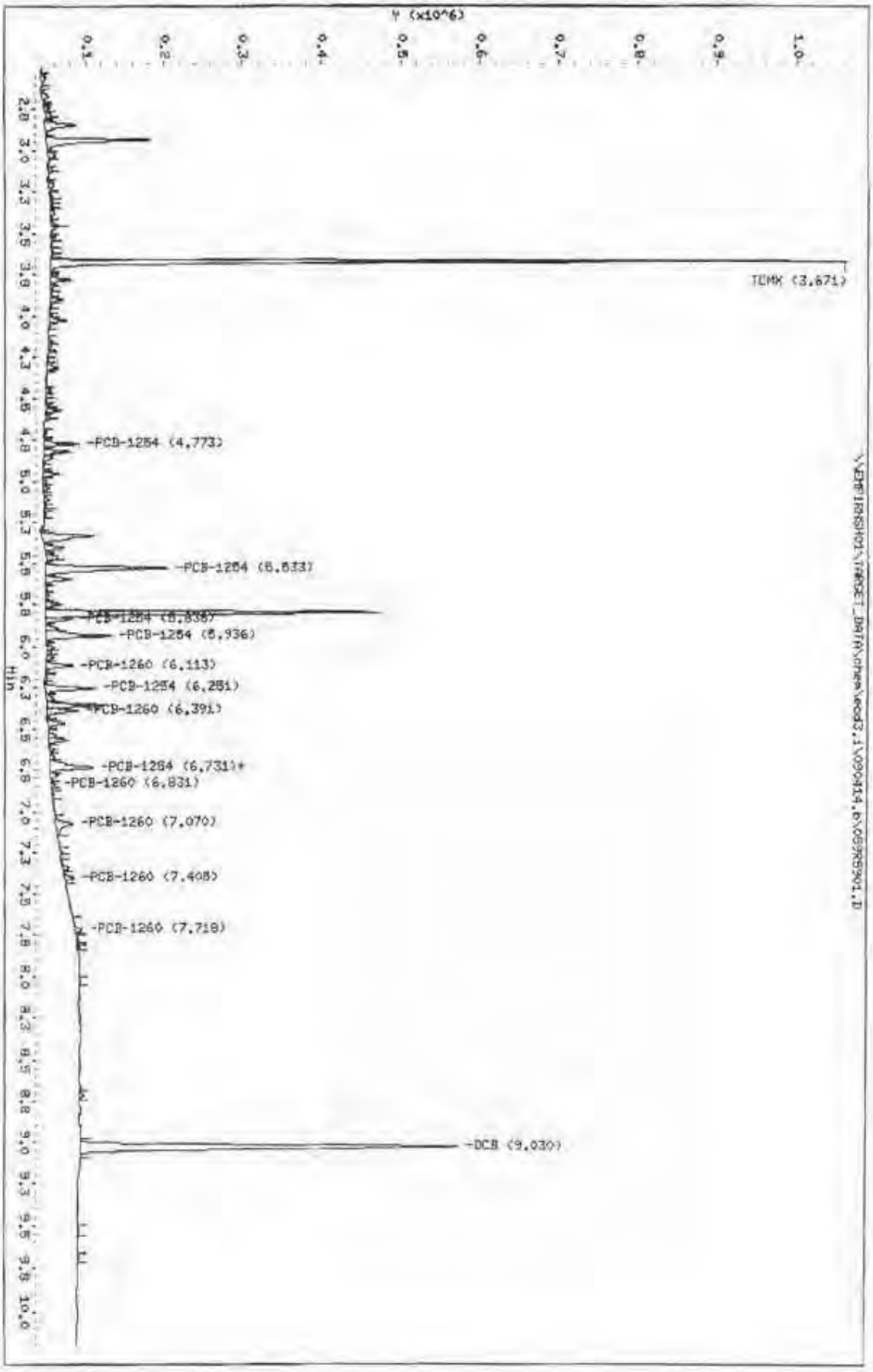
Date : 05-SEP-2014 03:14
Client ID:
Sample Info: 1408016-17R2
Column phase: Agilent DB-CLP2

Operator:
Column diameter: 0.32

Instrument: ecd3.i



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Page 1

HOLDING TIME SUMMARY
SW8082A

Laboratory: Empirical Laboratories, LLC
SDG: 1408016
Client: CH2M Hill, Inc.
Project: NTR Vieques CTO 113 SWMU 6

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
VWW06-SD044-0006	07/31/14 08:35	08/05/14 08:50	08/08/14 13:36	8.25	14.00	08/25/14 18:52	17.22	40.00	
VWW06-SD044-2430	07/31/14 08:40	08/05/14 08:50	08/08/14 13:36	8.25	14.00	08/25/14 19:07	17.23	40.00	
VWW06-SD044-4854	07/31/14 08:45	08/05/14 08:50	08/08/14 13:36	8.24	14.00	08/21/14 01:12	12.48	40.00	
VWW06-SD044-7278	07/31/14 08:50	08/05/14 08:50	08/08/14 13:36	8.24	14.00	08/21/14 01:27	12.49	40.00	
VWW06-SD045-0006	07/31/14 09:25	08/05/14 08:50	08/08/14 13:36	8.22	14.00	08/25/14 19:51	17.26	40.00	
VWW06-SD045-2430	07/31/14 09:30	08/05/14 08:50	08/08/14 13:36	8.21	14.00	08/25/14 20:05	17.27	40.00	
VWW06-SD045-4854	07/31/14 09:35	08/05/14 08:50	08/08/14 13:36	8.21	14.00	08/21/14 02:11	12.52	40.00	
VWW06-SD045-4854	07/31/14 09:35	08/05/14 08:50	08/27/14 14:00	27.23	14.00	08/29/14 09:07	1.80	40.00	* excluded
VWW06-SD045-7278	07/31/14 09:40	08/05/14 08:50	08/08/14 13:36	8.21	14.00	08/21/14 02:25	12.53	40.00	
VWW06-SD039-0006	07/31/14 10:00	08/05/14 08:50	08/08/14 13:36	8.19	14.00	08/25/14 20:20	17.28	40.00	
VWW06-SD039-0006	07/31/14 10:00	08/05/14 08:50	08/29/14 12:17	29.14	14.00	09/05/14 02:44	6.60	40.00	* excluded
VWW06-SD039-2430	07/31/14 10:05	08/05/14 08:50	08/08/14 13:36	8.19	14.00	08/25/14 20:35	17.29	40.00	
VWW06-SD039-4854	07/31/14 10:10	08/05/14 08:50	08/08/14 13:36	8.18	14.00	08/21/14 03:53	12.60	40.00	
VWW06-SD039-7278	07/31/14 10:15	08/05/14 08:50	08/08/14 13:36	8.18	14.00	08/21/14 04:07	12.60	40.00	
VWW06-SD038-0006	07/31/14 10:50	08/05/14 08:50	08/08/14 13:36	8.16	14.00	08/25/14 20:49	17.30	40.00	
VWW06-SD038-0006	07/31/14 10:50	08/05/14 08:50	08/29/14 12:17	29.10	14.00	09/05/14 02:59	6.61	40.00	* flag J/UJ
VWW06-SD038-2430	07/31/14 10:55	08/05/14 08:50	08/08/14 13:36	8.15	14.00	08/21/14 04:36	12.63	40.00	
VWW06-SD038-2430	07/31/14 10:55	08/05/14 08:50	08/27/14 14:00	27.17	14.00	08/29/14 09:22	1.81	40.00	* exclude
VWW06-SD038-4854	07/31/14 11:00	08/05/14 08:50	08/08/14 13:36	8.15	14.00	08/21/14 04:51	12.64	40.00	
VWW06-SD038-7278	07/31/14 11:05	08/05/14 08:50	08/08/14 13:36	8.15	14.00	08/21/14 05:06	12.65	40.00	
VWW06-SD038-7278	07/31/14 11:05	08/05/14 08:50	08/27/14 14:00	27.16	14.00	08/29/14 10:06	1.84	40.00	* exclude
VWW06-SD037-0006	07/31/14 12:20	08/05/14 08:50	08/08/14 13:36	8.09	14.00	08/25/14 21:04	17.31	40.00	
VWW06-SD037-0006	07/31/14 12:20	08/05/14 08:50	08/29/14 12:17	29.04	14.00	09/05/14 03:14	6.62	40.00	* flag J/UJ

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HOLDING TIME SUMMARY
SW8082A

Laboratory: Empirical Laboratories, LLC SDG: 1408016

Client: CH2M Hill, Inc. Project: NTR Vieques CTO 113 SWMU 6

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
VWW06-SD037-2430	07/31/14 12:25	08/05/14 08:50	08/08/14 13:36	8.09	14.00	08/25/14 22:46	17.38	40.00	
VWW06-SD037-4854	07/31/14 12:30	08/05/14 08:50	08/08/14 13:36	8.09	14.00	08/21/14 06:19	12.70	40.00	
VWW06-SD037-7278	07/31/14 12:35	08/05/14 08:50	08/08/14 13:36	8.08	14.00	08/21/14 06:33	12.71	40.00	
VWW06-SD037P-7278	07/31/14 12:40	08/05/14 08:50	08/11/14 08:29	10.87	14.00	08/12/14 18:29	1.42	40.00	
VWW06-EB01-080114	08/01/14 06:30	08/05/14 08:50	08/08/14 17:51	7.51	7.00	08/11/14 19:15	3.06	40.00	*
VWW06-SD036-0006	08/01/14 08:40	08/05/14 08:50	08/11/14 08:29	10.03	14.00	08/26/14 19:50	15.47	40.00	
VWW06-SD036-2430	08/01/14 08:45	08/05/14 08:50	08/11/14 08:29	10.03	14.00	08/12/14 18:57	1.44	40.00	
VWW06-SD036-4854	08/01/14 08:50	08/05/14 08:50	08/11/14 08:29	10.03	14.00	08/12/14 19:38	1.46	40.00	
VWW06-SD036-7278	08/01/14 08:55	08/05/14 08:50	08/11/14 08:29	10.02	14.00	08/12/14 19:51	1.47	40.00	
VWW06-SD035-0006	08/01/14 09:35	08/05/14 08:50	08/11/14 08:29	10.00	14.00	08/26/14 20:04	15.48	40.00	
VWW06-SD035P-0006	08/01/14 09:40	08/05/14 08:50	08/11/14 08:29	9.99	14.00	08/26/14 20:19	15.49	40.00	
VWW06-SD035P-0006	08/01/14 09:40	08/05/14 08:50	08/29/14 12:17	28.15	14.00	09/05/14 03:28	6.63	40.00	*
VWW06-SD035-2430	08/01/14 09:45	08/05/14 08:50	08/11/14 08:29	9.99	14.00	08/12/14 21:55	1.56	40.00	
VWW06-SD035-4854	08/01/14 09:50	08/05/14 08:50	08/11/14 08:29	9.99	14.00	08/12/14 22:08	1.57	40.00	
VWW06-SD035-7278	08/01/14 09:55	08/05/14 08:50	08/11/14 08:29	9.98	14.00	08/12/14 22:22	1.58	40.00	
VWW06-SD034-0006	08/01/14 10:30	08/05/14 08:50	08/11/14 08:29	9.96	14.00	08/26/14 20:33	15.50	40.00	
VWW06-SD034-0006	08/01/14 10:30	08/05/14 08:50	08/29/14 12:17	28.12	14.00	09/05/14 03:43	6.64	40.00	*
VWW06-SD034-2430	08/01/14 10:35	08/05/14 08:50	08/11/14 08:29	9.95	14.00	08/12/14 22:49	1.60	40.00	
VWW06-SD034-4854	08/01/14 10:40	08/05/14 08:50	08/11/14 08:29	9.95	14.00	08/12/14 23:03	1.61	40.00	
VWW06-SD034-7278	08/01/14 10:45	08/05/14 08:50	08/11/14 08:29	9.95	14.00	08/12/14 23:17	1.62	40.00	
VWW06-EB01-080414	08/04/14 07:00	08/05/14 08:50	08/08/14 17:51	4.49	7.00	08/11/14 19:28	3.07	40.00	

Flag 5/8/17

exclude

exclude

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SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408016
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H22502	Instrument:	GL-ECD3
		Calibration:	4209006

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (4H22502-CCV1) ug/L				Lab File ID: 003F0301.D		Analyzed: 08/11/14 11:41		
Tetrachloro-m-xylene	100.0	92.4	80 - 120	2.404	2.404	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	94.0	80 - 120	2.862	2.862	0.0000	+/-0.030	
Decachlorobiphenyl	100.0	88.6	80 - 120	7.159	7.159	0.0000	+/-0.030	
Decachlorobiphenyl [2C]	100.0	90.6	80 - 120	7.934	7.934	0.0000	+/-0.030	
Calibration Check (4H22502-CCV6) ug/L				Lab File ID: 028F2801.D		Analyzed: 08/11/14 17:05		
Tetrachloro-m-xylene	100.0	94.0	80 - 120	2.404	2.404	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	95.5	80 - 120	2.862	2.862	0.0000	+/-0.030	
Decachlorobiphenyl	100.0	97.8	80 - 120	7.157	7.159	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	100.0	100	80 - 120	7.932	7.934	-0.0020	+/-0.030	
Blank (4H07026-BLK1) ug/L				Lab File ID: 035F3501.D		Analyzed: 08/11/14 18:36		
Tetrachloro-m-xylene	0.5000	77.4	25 - 140	2.402	2.404	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	0.5000	79.4	25 - 140	2.861	2.862	-0.0010	+/-0.030	
Decachlorobiphenyl	0.5000	81.7	40 - 135	7.157	7.159	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	0.5000	85.5	40 - 135	7.933	7.934	-0.0010	+/-0.030	
LCS (4H07026-BS1) ug/L				Lab File ID: 036F3601.D		Analyzed: 08/11/14 18:49		
Tetrachloro-m-xylene	0.5000	75.5	25 - 140	2.402	2.404	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	0.5000	80.5	25 - 140	2.861	2.862	-0.0010	+/-0.030	
Decachlorobiphenyl	0.5000	77.9	40 - 135	7.157	7.159	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	0.5000	81.5	40 - 135	7.933	7.934	-0.0010	+/-0.030	
LCS Dup (4H07026-BSD1) ug/L				Lab File ID: 037F3701.D		Analyzed: 08/11/14 19:02		
Tetrachloro-m-xylene	0.5000	73.1	25 - 140	2.403	2.404	-0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	0.5000	77.8	25 - 140	2.861	2.862	-0.0010	+/-0.030	
Decachlorobiphenyl	0.5000	74.2	40 - 135	7.158	7.159	-0.0010	+/-0.030	
Decachlorobiphenyl [2C]	0.5000	77.9	40 - 135	7.934	7.934	0.0000	+/-0.030	
VWW06-EB01-080114 (1408016-22) ug/L				Lab File ID: 038F3801.D		Analyzed: 08/11/14 19:15		
Tetrachloro-m-xylene	0.4902	64.9	25 - 140	2.404	2.404	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	0.4902	69.2	25 - 140	2.861	2.862	-0.0010	+/-0.030	
Decachlorobiphenyl	0.4902	33.5	40 - 135	7.157	7.159	-0.0020	+/-0.030	*
Decachlorobiphenyl [2C]	0.4902	36.1	40 - 135	7.933	7.934	-0.0010	+/-0.030	*
VWW06-EB01-080414 (1408016-36) ug/L				Lab File ID: 039F3901.D		Analyzed: 08/11/14 19:28		
Tetrachloro-m-xylene	0.4808	65.6	25 - 140	2.404	2.404	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	0.4808	69.5	25 - 140	2.862	2.862	0.0000	+/-0.030	
Decachlorobiphenyl	0.4808	50.0	40 - 135	7.157	7.159	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	0.4808	52.9	40 - 135	7.934	7.934	0.0000	+/-0.030	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408016
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H22602	Instrument:	GL-ECD3
		Calibration:	4209006

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q	
Matrix Spike (4H08016-MS1) ug/Kg dry				Lab File ID: 026F2601.D		Analyzed: 08/12/14 19:11			
Tetrachloro-m-xylene	26.09	70.4	70 - 125	2.374	2.372	0.0020	+/-0.030		
Tetrachloro-m-xylene [2C]	26.09	73.3	70 - 125	2.824	2.824	0.0000	+/-0.030		
Decachlorobiphenyl	26.09	78.0	60 - 125	7.109	7.109	0.0000	+/-0.030		
Decachlorobiphenyl [2C]	26.09	78.4	60 - 125	7.868	7.869	-0.0010	+/-0.030		
Matrix Spike Dup (4H08016-MSD1) ug/Kg dry				Lab File ID: 027F2701.D		Analyzed: 08/12/14 19:24			
Tetrachloro-m-xylene	25.41	74.7	70 - 125	2.374	2.372	0.0020	+/-0.030		
Tetrachloro-m-xylene [2C]	25.41	77.9	70 - 125	2.824	2.824	0.0000	+/-0.030		
Decachlorobiphenyl	25.41	80.4	60 - 125	7.109	7.109	0.0000	+/-0.030		
Decachlorobiphenyl [2C]	25.41	81.3	60 - 125	7.867	7.869	-0.0020	+/-0.030		
VWW06-SD036-4854 (1408016-25) ug/Kg dry				Lab File ID: 028F2801.D		Analyzed: 08/12/14 19:38			
Tetrachloro-m-xylene	30.02	69.6	70 - 125	2.374	2.372	0.0020	+/-0.030	*	NQ
Tetrachloro-m-xylene [2C]	30.02	73.6	70 - 125	2.824	2.824	0.0000	+/-0.030		
Decachlorobiphenyl	30.02	74.0	60 - 125	7.107	7.109	-0.0020	+/-0.030		
Decachlorobiphenyl [2C]	30.02	75.3	60 - 125	7.867	7.869	-0.0020	+/-0.030		
VWW06-SD036-7278 (1408016-26) ug/Kg dry				Lab File ID: 029F2901.D		Analyzed: 08/12/14 19:51			
Tetrachloro-m-xylene	29.81	68.2	70 - 125	2.374	2.372	0.0020	+/-0.030	*	NQ
Tetrachloro-m-xylene [2C]	29.81	71.9	70 - 125	2.824	2.824	0.0000	+/-0.030		
Decachlorobiphenyl	29.81	77.9	60 - 125	7.107	7.109	-0.0020	+/-0.030		
Decachlorobiphenyl [2C]	29.81	79.7	60 - 125	7.867	7.869	-0.0020	+/-0.030		
Calibration Check (4H22602-CCV7) ug/L				Lab File ID: 031F3101.D		Analyzed: 08/12/14 20:19			
Tetrachloro-m-xylene	100.0	89.6	80 - 120	2.373	2.372	0.0010	+/-0.030		
Tetrachloro-m-xylene [2C]	100.0	91.1	80 - 120	2.825	2.824	0.0010	+/-0.030		
Decachlorobiphenyl	100.0	91.2	80 - 120	7.108	7.109	-0.0010	+/-0.030		
Decachlorobiphenyl [2C]	100.0	91.7	80 - 120	7.868	7.869	-0.0010	+/-0.030		
VWW06-SD035-2430 (1408016-29) ug/Kg dry				Lab File ID: 038F3801.D		Analyzed: 08/12/14 21:55			
Tetrachloro-m-xylene	28.19	69.6	70 - 125	2.374	2.372	0.0020	+/-0.030	*	NQ
Tetrachloro-m-xylene [2C]	28.19	73.5	70 - 125	2.824	2.824	0.0000	+/-0.030		
Decachlorobiphenyl	28.19	80.8	60 - 125	7.107	7.109	-0.0020	+/-0.030		
Decachlorobiphenyl [2C]	28.19	82.0	60 - 125	7.867	7.869	-0.0020	+/-0.030		
VWW06-SD035-4854 (1408016-30) ug/Kg dry				Lab File ID: 039F3901.D		Analyzed: 08/12/14 22:08			
Tetrachloro-m-xylene	29.32	64.0	70 - 125	2.374	2.372	0.0020	+/-0.030	*	JTWJ
Tetrachloro-m-xylene [2C]	29.32	69.1	70 - 125	2.824	2.824	0.0000	+/-0.030	*	
Decachlorobiphenyl	29.32	72.9	60 - 125	7.107	7.109	-0.0020	+/-0.030		
Decachlorobiphenyl [2C]	29.32	74.5	60 - 125	7.867	7.869	-0.0020	+/-0.030		

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408016
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU6
Sequence:	4H23711	Instrument:	GL-ECD3
		Calibration:	4232001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (4H23711-CCV1) ug/L				Lab File ID: 004F0401.D		Analyzed: 08/20/14 12:11		
Tetrachloro-m-xylene	100.0	93.4	80 - 120	2.971	2.971	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	87.4	80 - 120	3.473	3.473	0.0000	+/-0.030	
Decachlorobiphenyl	100.0	84.8	80 - 120	7.823	7.823	0.0000	+/-0.030	
Decachlorobiphenyl [2C]	100.0	85.2	80 - 120	8.656	8.656	0.0000	+/-0.030	
Calibration Check (4H23711-CCV9) ug/L				Lab File ID: 046F4601.D		Analyzed: 08/20/14 22:32		
Tetrachloro-m-xylene	100.0	99.4	80 - 120	2.961	2.971	-0.0100	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	93.8	80 - 120	3.46	3.473	-0.0130	+/-0.030	
Decachlorobiphenyl	100.0	75.8	80 - 120	7.816	7.823	-0.0070	+/-0.030	*
Decachlorobiphenyl [2C]	100.0	73.8	80 - 120	8.65	8.656	-0.0060	+/-0.030	*
Blank (4H0702S-BLK1) ug/Kg wet				Lab File ID: 051F5101.D		Analyzed: 08/20/14 23:45		
Tetrachloro-m-xylene	16.67	98.3	70 - 125	2.961	2.971	-0.0100	+/-0.030	
Tetrachloro-m-xylene [2C]	16.67	96.0	70 - 125	3.459	3.473	-0.0140	+/-0.030	
Decachlorobiphenyl	16.67	79.8	60 - 125	7.819	7.823	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	16.67	79.4	60 - 125	8.651	8.656	-0.0050	+/-0.030	
LCS (4H0702S-BS1) ug/Kg wet				Lab File ID: 052F5201.D		Analyzed: 08/20/14 23:59		
Tetrachloro-m-xylene	16.67	92.0	70 - 125	2.961	2.971	-0.0100	+/-0.030	
Tetrachloro-m-xylene [2C]	16.67	89.9	70 - 125	3.459	3.473	-0.0140	+/-0.030	
Decachlorobiphenyl	16.67	87.9	60 - 125	7.817	7.823	-0.0060	+/-0.030	
Decachlorobiphenyl [2C]	16.67	87.3	60 - 125	8.651	8.656	-0.0050	+/-0.030	
VWW06-SD044-4854 (1408016-03) ug/Kg dry				Lab File ID: 057F5701.D		Analyzed: 08/21/14 01:12		
Tetrachloro-m-xylene	30.76	73.2	70 - 125	2.961	2.971	-0.0100	+/-0.030	
Tetrachloro-m-xylene [2C]	30.76	73.1	70 - 125	3.46	3.473	-0.0130	+/-0.030	
Decachlorobiphenyl	30.76	52.4	60 - 125	7.818	7.823	-0.0050	+/-0.030	*
Decachlorobiphenyl [2C]	30.76	53.8	60 - 125	8.65	8.656	-0.0060	+/-0.030	*
VWW06-SD044-7278 (1408016-04) ug/Kg dry				Lab File ID: 058F5801.D		Analyzed: 08/21/14 01:27		
Tetrachloro-m-xylene	27.52	76.7	70 - 125	2.96	2.971	-0.0110	+/-0.030	
Tetrachloro-m-xylene [2C]	27.52	76.4	70 - 125	3.46	3.473	-0.0130	+/-0.030	
Decachlorobiphenyl	27.52	69.8	60 - 125	7.816	7.823	-0.0070	+/-0.030	
Decachlorobiphenyl [2C]	27.52	71.0	60 - 125	8.65	8.656	-0.0060	+/-0.030	
VWW06-SD045-4854 (1408016-07) ug/Kg dry				Lab File ID: 061F6101.D		Analyzed: 08/21/14 02:11		
Tetrachloro-m-xylene	29.62	67.0	70 - 125	2.959	2.971	-0.0120	+/-0.030	*
Tetrachloro-m-xylene [2C]	29.62	69.4	70 - 125	3.459	3.473	-0.0140	+/-0.030	*
Decachlorobiphenyl	29.62	43.4	60 - 125	7.816	7.823	-0.0070	+/-0.030	*
Decachlorobiphenyl [2C]	29.62	44.6	60 - 125	8.651	8.656	-0.0050	+/-0.030	*

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408016
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H23912	Instrument:	GL-ECD3
		Calibration:	4232001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
VWW06-SD035-0006 (1408016-27) ug/Kg dry				Lab File ID: 035F3501.D		Analyzed: 08/26/14 20:04		
Tetrachloro-m-xylene	39.17	69.6	70 - 125	2.812	2.814	-0.0020	+/-0.030	*
Tetrachloro-m-xylene [2C]	39.17	69.4	70 - 125	3.279	3.281	-0.0020	+/-0.030	*
Decachlorobiphenyl	39.17	68.3	60 - 125	7.584	7.584	0.0000	+/-0.030	
Decachlorobiphenyl [2C]	39.17	72.5	60 - 125	8.329	8.33	-0.0010	+/-0.030	
VWW06-SD035P-0006 (1408016-28) ug/Kg dry				Lab File ID: 036F3601.D		Analyzed: 08/26/14 20:19		
Tetrachloro-m-xylene	39.95	60.3	70 - 125	2.812	2.814	-0.0020	+/-0.030	*
Tetrachloro-m-xylene [2C]	39.95	61.7	70 - 125	3.279	3.281	-0.0020	+/-0.030	*
Decachlorobiphenyl	39.95	53.9	60 - 125	7.584	7.584	0.0000	+/-0.030	*
Decachlorobiphenyl [2C]	39.95	57.8	60 - 125	8.329	8.33	-0.0010	+/-0.030	*
VWW06-SD034-0006 (1408016-32) ug/Kg dry				Lab File ID: 037F3701.D		Analyzed: 08/26/14 20:33		
Tetrachloro-m-xylene	50.32	47.4	70 - 125	2.812	2.814	-0.0020	+/-0.030	*
Tetrachloro-m-xylene [2C]	50.32	48.6	70 - 125	3.281	3.281	0.0000	+/-0.030	*
Decachlorobiphenyl	50.32	44.8	60 - 125	7.584	7.584	0.0000	+/-0.030	*
Decachlorobiphenyl [2C]	50.32	48.5	60 - 125	8.331	8.33	0.0010	+/-0.030	*
Calibration Check (4H23912-CCVB) ug/L				Lab File ID: 049F4901.D		Analyzed: 08/26/14 23:29		
Tetrachloro-m-xylene	100.0	95.2	80 - 120	2.812	2.814	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	96.4	80 - 120	3.279	3.281	-0.0020	+/-0.030	
Decachlorobiphenyl	100.0	93.1	80 - 120	7.584	7.584	0.0000	+/-0.030	
Decachlorobiphenyl [2C]	100.0	97.9	80 - 120	8.329	8.33	-0.0010	+/-0.030	

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SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408016
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H22602	Instrument:	GL-ECD3
		Calibration:	4209006

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q	
VWW06-SD035-7278 (1408016-31) ug/Kg dry				Lab File ID: 040F4001.D		Analyzed: 08/12/14 22:22			
Tetrachloro-m-xylene	29.52	69.1	70 - 125	2.373	2.372	0.0010	+/-0.030	*	NQ
Tetrachloro-m-xylene [2C]	29.52	73.1	70 - 125	2.823	2.824	-0.0010	+/-0.030		
Decachlorobiphenyl	29.52	77.2	60 - 125	7.107	7.109	-0.0020	+/-0.030		
Decachlorobiphenyl [2C]	29.52	79.5	60 - 125	7.867	7.869	-0.0020	+/-0.030		
VWW06-SD034-2430 (1408016-33) ug/Kg dry				Lab File ID: 042F4201.D		Analyzed: 08/12/14 22:49			
Tetrachloro-m-xylene	28.13	69.1	70 - 125	2.373	2.372	0.0010	+/-0.030	*	NQ
Tetrachloro-m-xylene [2C]	28.13	74.2	70 - 125	2.824	2.824	0.0000	+/-0.030		
Decachlorobiphenyl	28.13	75.5	60 - 125	7.107	7.109	-0.0020	+/-0.030		
Decachlorobiphenyl [2C]	28.13	77.9	60 - 125	7.867	7.869	-0.0020	+/-0.030		
VWW06-SD034-4854 (1408016-34) ug/Kg dry				Lab File ID: 043F4301.D		Analyzed: 08/12/14 23:03			
Tetrachloro-m-xylene	32.00	60.2	70 - 125	2.373	2.372	0.0010	+/-0.030	*	J/UJ
Tetrachloro-m-xylene [2C]	32.00	65.3	70 - 125	2.823	2.824	-0.0010	+/-0.030	*	
Decachlorobiphenyl	32.00	66.9	60 - 125	7.107	7.109	-0.0020	+/-0.030		
Decachlorobiphenyl [2C]	32.00	68.8	60 - 125	7.867	7.869	-0.0020	+/-0.030		
VWW06-SD034-7278 (1408016-35) ug/Kg dry				Lab File ID: 044F4401.D		Analyzed: 08/12/14 23:17			
Tetrachloro-m-xylene	25.72	63.6	70 - 125	2.373	2.372	0.0010	+/-0.030	*	J/UJ
Tetrachloro-m-xylene [2C]	25.72	68.8	70 - 125	2.823	2.824	-0.0010	+/-0.030	*	
Decachlorobiphenyl	25.72	73.6	60 - 125	7.108	7.109	-0.0010	+/-0.030		
Decachlorobiphenyl [2C]	25.72	75.8	60 - 125	7.867	7.869	-0.0020	+/-0.030		
Calibration Check (4H22602-CCVF) ug/L				Lab File ID: 051F5101.D		Analyzed: 08/13/14 00:53			
Tetrachloro-m-xylene	100.0	86.3	80 - 120	2.374	2.372	0.0020	+/-0.030		
Tetrachloro-m-xylene [2C]	100.0	90.6	80 - 120	2.824	2.824	0.0000	+/-0.030		
Decachlorobiphenyl	100.0	94.5	80 - 120	7.107	7.109	-0.0020	+/-0.030		
Decachlorobiphenyl [2C]	100.0	95.8	80 - 120	7.867	7.869	-0.0020	+/-0.030		

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SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408016
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H23711	Instrument:	GL-ECD3
		Calibration:	4232001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
VWW06-SD045-7278 (1408016-08) ug/Kg dry				Lab File ID: 062F6201.D		Analyzed: 08/21/14 02:25		
Tetrachloro-m-xylene	26.79	75.5	70 - 125	2.961	2.971	-0.0100	+/-0.030	
Tetrachloro-m-xylene [2C]	26.79	75.0	70 - 125	3.459	3.473	-0.0140	+/-0.030	
Decachlorobiphenyl	26.79	63.0	60 - 125	7.817	7.823	-0.0060	+/-0.030	
Decachlorobiphenyl [2C]	26.79	64.7	60 - 125	8.651	8.656	-0.0050	+/-0.030	
Calibration Check (4H23711-CCVG) ug/L				Lab File ID: 067F6701.D		Analyzed: 08/21/14 03:38		
Tetrachloro-m-xylene	100.0	99.0	80 - 120	2.96	2.971	-0.0110	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	95.1	80 - 120	3.46	3.473	-0.0130	+/-0.030	
Decachlorobiphenyl	100.0	90.8	80 - 120	7.818	7.823	-0.0050	+/-0.030	
Decachlorobiphenyl [2C]	100.0	90.7	80 - 120	8.652	8.656	-0.0040	+/-0.030	
VWW06-SD039-4854 (1408016-11) ug/Kg dry				Lab File ID: 068F6801.D		Analyzed: 08/21/14 03:53		
Tetrachloro-m-xylene	30.50	74.1	70 - 125	2.96	2.971	-0.0110	+/-0.030	
Tetrachloro-m-xylene [2C]	30.50	73.3	70 - 125	3.46	3.473	-0.0130	+/-0.030	
Decachlorobiphenyl	30.50	48.6	60 - 125	7.818	7.823	-0.0050	+/-0.030	*
Decachlorobiphenyl [2C]	30.50	49.6	60 - 125	8.65	8.656	-0.0060	+/-0.030	*
VWW06-SD039-7278 (1408016-12) ug/Kg dry				Lab File ID: 069F6901.D		Analyzed: 08/21/14 04:07		
Tetrachloro-m-xylene	27.60	77.5	70 - 125	2.96	2.971	-0.0110	+/-0.030	
Tetrachloro-m-xylene [2C]	27.60	77.8	70 - 125	3.46	3.473	-0.0130	+/-0.030	
Decachlorobiphenyl	27.60	68.3	60 - 125	7.817	7.823	-0.0060	+/-0.030	
Decachlorobiphenyl [2C]	27.60	70.1	60 - 125	8.65	8.656	-0.0060	+/-0.030	
VWW06-SD038-2430 (1408016-14) ug/Kg dry				Lab File ID: 071F7101.D		Analyzed: 08/21/14 04:36		
Tetrachloro-m-xylene	25.84	69.9	70 - 125	2.961	2.971	-0.0100	+/-0.030	*
Tetrachloro-m-xylene [2C]	25.84	70.4	70 - 125	3.46	3.473	-0.0130	+/-0.030	
Decachlorobiphenyl	25.84	49.6	60 - 125	7.818	7.823	-0.0050	+/-0.030	*
Decachlorobiphenyl [2C]	25.84	51.4	60 - 125	8.65	8.656	-0.0060	+/-0.030	*
VWW06-SD038-4854 (1408016-15) ug/Kg dry				Lab File ID: 072F7201.D		Analyzed: 08/21/14 04:51		
Tetrachloro-m-xylene	30.88	73.7	70 - 125	2.961	2.971	-0.0100	+/-0.030	
Tetrachloro-m-xylene [2C]	30.88	72.8	70 - 125	3.46	3.473	-0.0130	+/-0.030	
Decachlorobiphenyl	30.88	46.1	60 - 125	7.818	7.823	-0.0050	+/-0.030	*
Decachlorobiphenyl [2C]	30.88	47.1	60 - 125	8.651	8.656	-0.0050	+/-0.030	*
VWW06-SD038-7278 (1408016-16) ug/Kg dry				Lab File ID: 073F7301.D		Analyzed: 08/21/14 05:06		
Tetrachloro-m-xylene	31.48	63.2	70 - 125	2.961	2.971	-0.0100	+/-0.030	*
Tetrachloro-m-xylene [2C]	31.48	62.4	70 - 125	3.461	3.473	-0.0120	+/-0.030	*
Decachlorobiphenyl	31.48	34.4	60 - 125	7.818	7.823	-0.0050	+/-0.030	*
Decachlorobiphenyl [2C]	31.48	35.5	60 - 125	8.651	8.656	-0.0050	+/-0.030	*

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SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408016
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H24102	Instrument:	GL-ECD3
		Calibration:	4232003

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
VWW06-SD045-0006 (1408016-05RE1) ug/Kg dry				Lab File ID: 026F2601.D		Analyzed: 08/25/14 19:51		
Tetrachloro-m-xylene	60.70	79.5	70 - 125	2.84	2.842	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	60.70	82.6	70 - 125	3.31	3.314	-0.0040	+/-0.030	
Decachlorobiphenyl	60.70	66.1	60 - 125	7.632	7.634	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	60.70	70.5	60 - 125	8.387	8.388	-0.0010	+/-0.030	
VWW06-SD045-2430 (1408016-06RE1) ug/Kg dry				Lab File ID: 027F2701.D		Analyzed: 08/25/14 20:05		
Tetrachloro-m-xylene	22.67	77.5	70 - 125	2.84	2.842	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	22.67	81.0	70 - 125	3.312	3.314	-0.0020	+/-0.030	
Decachlorobiphenyl	22.67	65.2	60 - 125	7.63	7.634	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	22.67	67.9	60 - 125	8.387	8.388	-0.0010	+/-0.030	
VWW06-SD039-0006 (1408016-09RE1) ug/Kg dry				Lab File ID: 028F2801.D		Analyzed: 08/25/14 20:20		
Tetrachloro-m-xylene	33.25	53.1	70 - 125	2.84	2.842	-0.0020	+/-0.030	*
Tetrachloro-m-xylene [2C]	33.25	55.7	70 - 125	3.312	3.314	-0.0020	+/-0.030	*
Decachlorobiphenyl	33.25	30.4	60 - 125	7.632	7.634	-0.0020	+/-0.030	*
Decachlorobiphenyl [2C]	33.25	33.1	60 - 125	8.387	8.388	-0.0010	+/-0.030	*
VWW06-SD039-2430 (1408016-10RE1) ug/Kg dry				Lab File ID: 029F2901.D		Analyzed: 08/25/14 20:35		
Tetrachloro-m-xylene	27.06	69.2	70 - 125	2.84	2.842	-0.0020	+/-0.030	*
Tetrachloro-m-xylene [2C]	27.06	72.3	70 - 125	3.312	3.314	-0.0020	+/-0.030	
Decachlorobiphenyl	27.06	62.6	60 - 125	7.632	7.634	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	27.06	66.2	60 - 125	8.387	8.388	-0.0010	+/-0.030	
VWW06-SD038-0006 (1408016-13RE1) ug/Kg dry				Lab File ID: 030F3001.D		Analyzed: 08/25/14 20:49		
Tetrachloro-m-xylene	33.20	60.2	70 - 125	2.84	2.842	-0.0020	+/-0.030	*
Tetrachloro-m-xylene [2C]	33.20	63.3	70 - 125	3.31	3.314	-0.0040	+/-0.030	*
Decachlorobiphenyl	33.20	43.7	60 - 125	7.631	7.634	-0.0030	+/-0.030	*
Decachlorobiphenyl [2C]	33.20	46.9	60 - 125	8.387	8.388	-0.0010	+/-0.030	*
VWW06-SD037-0006 (1408016-17RE1) ug/Kg dry				Lab File ID: 031F3101.D		Analyzed: 08/25/14 21:04		
Tetrachloro-m-xylene	37.53	37.9	70 - 125	2.84	2.842	-0.0020	+/-0.030	*
Tetrachloro-m-xylene [2C]	37.53	40.1	70 - 125	3.311	3.314	-0.0030	+/-0.030	*
Decachlorobiphenyl	37.53	18.5	60 - 125	7.631	7.634	-0.0030	+/-0.030	*
Decachlorobiphenyl [2C]	37.53	20.3	60 - 125	8.386	8.388	-0.0020	+/-0.030	*
Calibration Check (4H24102-CCV7) ug/L				Lab File ID: 032F3201.D		Analyzed: 08/25/14 21:18		
Tetrachloro-m-xylene	100.0	99.2	80 - 120	2.841	2.842	-0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	102	80 - 120	3.311	3.314	-0.0030	+/-0.030	
Decachlorobiphenyl	100.0	93.0	80 - 120	7.631	7.634	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	100.0	95.2	80 - 120	8.388	8.388	0.0000	+/-0.030	

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SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408016
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4I24623	Instrument:	GL-ECD3
		Calibration:	4232001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (4I24623-CCV1) ug/L				Lab File ID: 003F0301.D		Analyzed: 08/28/14 14:37		
Tetrachloro-m-xylene	100.0	93.6	80 - 120	2.764	2.764	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	89.5	80 - 120	3.226	3.226	0.0000	+/-0.030	
Decachlorobiphenyl	100.0	82.5	80 - 120	7.504	7.504	0.0000	+/-0.030	
Decachlorobiphenyl [2C]	100.0	87.6	80 - 120	8.232	8.232	0.0000	+/-0.030	
Calibration Check (4I24623-CCVH) ug/L				Lab File ID: 072F7201.D		Analyzed: 08/29/14 07:25		
Tetrachloro-m-xylene	100.0	101	80 - 120	2.761	2.764	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	103	80 - 120	3.219	3.226	-0.0070	+/-0.030	
Decachlorobiphenyl	100.0	88.9	80 - 120	7.497	7.504	-0.0070	+/-0.030	
Decachlorobiphenyl [2C]	100.0	94.7	80 - 120	8.227	8.232	-0.0050	+/-0.030	
Blank (4H26005-BLK1) ug/Kg wet				Lab File ID: 077F7701.D		Analyzed: 08/29/14 08:38		
Tetrachloro-m-xylene	16.67	81.4	70 - 125	2.761	2.764	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	16.67	86.1	70 - 125	3.22	3.226	-0.0060	+/-0.030	
Decachlorobiphenyl	16.67	75.3	60 - 125	7.498	7.504	-0.0060	+/-0.030	
Decachlorobiphenyl [2C]	16.67	82.1	60 - 125	8.227	8.232	-0.0050	+/-0.030	
LCS (4H26005-BS1) ug/Kg wet				Lab File ID: 078F7801.D		Analyzed: 08/29/14 08:52		
Tetrachloro-m-xylene	16.67	89.1	70 - 125	2.761	2.764	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	16.67	94.1	70 - 125	3.221	3.226	-0.0050	+/-0.030	
Decachlorobiphenyl	16.67	85.2	60 - 125	7.498	7.504	-0.0060	+/-0.030	
Decachlorobiphenyl [2C]	16.67	92.8	60 - 125	8.226	8.232	-0.0060	+/-0.030	
VWW06-SD045-4854 (1408016-07RE1) ug/Kg dry				Lab File ID: 079F7901.D		Analyzed: 08/29/14 09:07		
Tetrachloro-m-xylene	28.57	57.9	70 - 125	2.761	2.764	-0.0030	+/-0.030	*
Tetrachloro-m-xylene [2C]	28.57	62.8	70 - 125	3.221	3.226	-0.0050	+/-0.030	*
Decachlorobiphenyl	28.57	30.7	60 - 125	7.499	7.504	-0.0050	+/-0.030	*
Decachlorobiphenyl [2C]	28.57	33.9	60 - 125	8.226	8.232	-0.0060	+/-0.030	*
VWW06-SD038-2430 (1408016-14RE1) ug/Kg dry				Lab File ID: 080F8001.D		Analyzed: 08/29/14 09:22		
Tetrachloro-m-xylene	26.69	70.7	70 - 125	2.762	2.764	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	26.69	73.5	70 - 125	3.223	3.226	-0.0030	+/-0.030	
Decachlorobiphenyl	26.69	34.9	60 - 125	7.499	7.504	-0.0050	+/-0.030	*
Decachlorobiphenyl [2C]	26.69	38.4	60 - 125	8.226	8.232	-0.0060	+/-0.030	*
Matrix Spike (4H26005-MS1) ug/Kg dry				Lab File ID: 081F8101.D		Analyzed: 08/29/14 09:36		
Tetrachloro-m-xylene	26.82	88.3	70 - 125	2.763	2.764	-0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	26.82	84.5	70 - 125	3.224	3.226	-0.0020	+/-0.030	
Decachlorobiphenyl	26.82	62.1	60 - 125	7.501	7.504	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	26.82	67.6	60 - 125	8.228	8.232	-0.0040	+/-0.030	

exclude

exclude

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408016
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4I24623	Instrument:	GL-ECD3
		Calibration:	4232001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (4H26005-MSD1) ug/Kg dry				Lab File ID: 082F8201.D		Analyzed: 08/29/14 09:51		
Tetrachloro-m-xylene	26.84	84.9	70 - 125	2.762	2.764	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	26.84	80.4	70 - 125	3.221	3.226	-0.0050	+/-0.030	
Decachlorobiphenyl	26.84	53.0	60 - 125	7.497	7.504	-0.0070	+/-0.030	*
Decachlorobiphenyl [2C]	26.84	58.8	60 - 125	8.226	8.232	-0.0060	+/-0.030	*
VWW06-SD038-7278 (1408016-16RE1) ug/Kg dry				Lab File ID: 083F8301.D		Analyzed: 08/29/14 10:06		
Tetrachloro-m-xylene	31.79	70.0	70 - 125	2.761	2.764	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	31.79	74.3	70 - 125	3.221	3.226	-0.0050	+/-0.030	
Decachlorobiphenyl	31.79	43.9	60 - 125	7.499	7.504	-0.0050	+/-0.030	*
Decachlorobiphenyl [2C]	31.79	48.1	60 - 125	8.226	8.232	-0.0060	+/-0.030	*
Calibration Check (4I24623-CCVO) ug/L				Lab File ID: 086F8601.D		Analyzed: 08/29/14 10:50		
Tetrachloro-m-xylene	100.0	106	80 - 120	2.763	2.764	-0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	110	80 - 120	3.222	3.226	-0.0040	+/-0.030	
Decachlorobiphenyl	100.0	98.0	80 - 120	7.498	7.504	-0.0060	+/-0.030	
Decachlorobiphenyl [2C]	100.0	104	80 - 120	8.227	8.232	-0.0050	+/-0.030	

NS

exclude

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

VWW06-SD035P-0006

Lab Name: Empirical Laboratories, LLC

Lab Sample ID: 1408016-28 Date(s) Analyzed: 08/26/2014 08/26/2014

Instrument ID (1): GL-ECD3 Instrument ID (2): GL-ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	4.92	4.84	4.90	25.4	
	2	6.12	6.14	6.20	41.7	49

This SDG contains 34 solid matrix samples and 2 QC blank samples analyzed for select metals using SW-846 methods 6010C. Region II validation guidelines were applied (updated 12/20/12) and these worksheets are submitted along with marked up pages from the data package and annotated form 1s and EDD files.

HOLDING TIMES

Sampling Date: 7/31, 8/1, 8/4
Received Date: 8/5/14
Prep. Dates: 8/13, 8/21, 8/22
Analysis Dates: 8/14-8/29

All preparation & analysis holding time requirements were met. Cooler temps were acceptable and receipt paperwork was in order. Several samples exhibited %solids values <50%. All results in samples VW006-SD045-0006 (27.10%), VW006-SD039-0006 (48.07%), VW006-SD038-0006 (48.59%), VWW06-SD037-0006 (43.31%), VWW06-SD036-0006 (48.33%), VWW06-SD035-0006 (41.61%), VWW06-SD035P-0006 (39.71%), and VWW06-SD034-0006 (32.79%) are flagged as estimated J/UJ.

CALIBRATIONS

All initial calibration criteria were met for the methods noted above. All ICV, CCV and low calibration standard criteria were met or associated samples were reanalyzed against acceptable QC standards. PQL standard criteria were met. ICSA/ICSAB results were within method criteria for all analytes. Raw data was verified.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- See blank type specific validation guidelines noted below (taken from the Region II SOP for CLP metals and adapted to this project).
- Qualification/Action codes:

Note: non-detect results are reported to the LOD so the LOD is the RL for this project.

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the reporting limit, when the ICB/CCB/PB result is less than the RL
R -	Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL
J/UJ -	Sample result is less than 10X RL when blank result is below the negative RL

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.
Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL when the field blank result is greater than the RL - result is reported as non-detect at the reporting limit.
R -	Sample result is greater than the RL and less than the field blank value when the field blank result is greater than the RL.
J -	Sample result is greater than the field blank value but less than 10X the field blank value when field blank result is greater than the RL.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	Action Level	Q Flag
no contamination was noted in the associated blanks				

See validation report for specific samples and qualifications. Only those analytes requiring action are listed here. Negative contamination in a prep blank or CCB, if less than the analyte CRDL, is qualified based on professional judgment. Field QC blank associations are determined using tracking provided by the client. Flags are applied to samples based on these associations. **The concentration noted for the CCBs is the highest concentration in all the associated CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for CCB contamination.**

MATRIX SPIKE/DUPLICATE SUMMARY

Qualifications were made based on the 12/12 revision of the Region II guidance SOPs which flags only the native sample for spike and spike dup recovery and RPD issues. The submitted PDS spikes were also considered in the evaluation of the spike data.

The MS/MSD pairs of samples VWW06-SD036-2430, VWW06-SD037-2430 & VWW06-SD044-2430 exhibited acceptable recoveries and RPDs. Two of the three PDS samples exhibited high recoveries but qualifications were not required since the pre-digestions spikes were acceptable. All associated LCS recoveries were acceptable also. No qualifications were required.

SERIAL DILUTIONS

The laboratory submitted acceptable serial dilution analyses. No qualifications were required.

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments. Dilutions were performed. The raw data and calculations were verified. Field duplicates were assessed – see the following page for results and qualifications if needed.

Reviewer Jacqueline Cleveland **Date:** 10/28/14

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD037-7278
Duplicate Sample ID: VWW06-SD037P-7278

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	1.42	1.68	17
zinc	8.85	9.6	8

COMMENTS: No qualifications were required.
*30% RPD limit for all analytes >5X LOD - results in both samples flagged J

Sample ID: VWW06-SD035-0006
Duplicate Sample ID: VWW06-SD035P-0006

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	84.6	118	33
zinc	274	462	51

COMMENTS: Flag both analytes as estimated J in the field duplicate pair.
*30% RPD limit for all analytes >5X LOD - results in both samples flagged J

CH2MHILL VIEQUES SWMU6 CTO-113

SDG 1408016

Reporting Limit Calcs

ICP - AES	
SAMPLE ID	VWW06-SD045-0006
ANALYTE	zinc
Form 1 LOD or LOQ Value (mg/Kg)	7.69
Analyte LOD or LOQ	2
SAMPLE SIZE (g)	0.96
DILUTION FACTOR	1
DRYNESS FACTOR	0.271
Corrected LOD or LOQ (mg/Kg)	7.688

CH2M HILL VIEQUES CTO-113

SDG 1408016

METALS CALCULATIONS

ICP - AES	
SAMPLE ID	VWW06-SD037-0006
ANALYTE	zinc
Lab Value CONCENTRATION (ug/Kg)	264
AMOUNT FROM RAW DATA (ug/L)	577.01
SAMPLE SIZE (g)	1.01
FINAL VOLUME (L)	0.2
DILUTION FACTOR	1
DRYNESS FACTOR	0.4331
CONVERSION FACTOR (g TO Kg)	1
CALCULATED CONCENTRATION (ug/Kg)	264

POST DIGEST SPIKE SAMPLE RECOVERY

SW6010C

VWW06-SD036-2430

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

Batch: 4H19011

Preparation: MET_3050B

SDG: 1408016

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4H19011-PS1

Lab Source ID: 1408016-24

Initial/Final: 0.99 g / 200 mL

Analyte	Spike Sample Result (SSR) (ug/L)	Sample Result (SR) (ug/L)	Spike Added (SA) (ug/L)	%R	Control Limit %R
Lead	274.4	4.972	250.0	108	80 - 120
Zinc	**619.5**	**10.91**	**500.0**	**122**	**80 - 120**

No Quals are required because matrix spikes are acceptable

POST DIGEST SPIKE SAMPLE RECOVERY

SW6010C

VWW06-SD037-2430

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

Batch: 4H19012

Preparation: MET_3050B

SDG: 1408016

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4H19012-PS1

Lab Source ID: 1408016-18

Initial/Final: 0.98 g / 200 mL

Analyte	Spike Sample Result (SSR) (ug/L)	Sample Result (SR) (ug/L)	Spike Added (SA) (ug/L)	%R	Control Limit %R
Lead	**514.3**	**4.236**	**250.0**	**204**	**80 - 120**
Zinc	611.2	15.58	500.0	119	80 - 120

No Quals are required because matrix spikes are acceptable

DataQual
Environmental Services, LLC

CH2M HILL-VBO
5701 Cleveland Street
Suite 200
Virginia Beach, VA 23462

October 28, 2014
SDG# 1408028; Empirical Laboratories, LLC
Vieques CTO-113, SWMU6 – Naval Training Range

Dear Ms. Dean,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1408028. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, professional judgment, and the guidance offered in the region II SOPs HW-2a Revision 15, December 2012, for ICP-AES data validation and HW-37 Revision 3, May 2013, for PCB data validation. The DoD Quality Systems Manual for Environmental Laboratories Version 4.2 and the project specific SAP were also consulted. Worksheets tabulating the validation process including calculation verifications are included in the support documentation section of this report. All areas of concern are discussed in the body of the report and a summary of data qualifications are provided.

Sample ID	Lab ID	Matrix	PCB	Pb, Zn
VWW06-SD029-0006	1408028-01	soil	X	X
VWW06-SD029-2430	1408028-02	soil	X	X
VWW06-SD029-4854	1408028-03	soil	X	X
VWW06-SD029-4854MS	1408028-03MS	soil	X	X
VWW06-SD029-4854MSD	1408028-03MSD	soil	X	X
VWW06-SD029-7278	1408028-04	soil	X	X
VWW06-SD030-0006	1408028-05	soil	X	X
VWW06-SD030-2430	1408028-06	soil	X	X
VWW06-SD030-4854	1408028-07	soil	X	X
VWW06-SD030P-4854	1408028-08	soil	X	X
VWW06-SD030-7278	1408028-09	soil	X	X
VWW06-SD031-0006	1408028-10	soil	X	X
VWW06-SD031-2430	1408028-11	soil	X	X
VWW06-SD031-4854	1408028-12	soil	X	X
VWW06-SD031-7278	1408028-13	soil	X	X
VWW06-SD031-7278MS	1408028-13MS	soil	X	X
VWW06-SD031-7278MSD	1408028-13MSD	soil	X	X
VWW06-SD032-0006	1408028-14	soil	X	X
VWW06-SD032-2430	1408028-15	soil	X	X
VWW06-SD032-4854	1408028-16	soil	X	X
VWW06-SD032P-4854	1408028-17	soil	X	X
VWW06-SD032-7278	1408028-18	soil	X	X
VWW06-EB01-080514	1408028-20	water	X	X

The following quality control samples were provided with this SDG: sample VWW06-SD030P-4854-field duplicate of sample VWW06-SD030-4854; sample VWW06-SD032P-4854-field duplicate of sample VWW06-SD032-4854; and sample VWW06-EB01-080514.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition
- Technical Holding Times
- Initial/Continuing Calibrations *
- ICSA/ICSAB Standards *
- Low Level Standards *
- Blanks *
- Surrogate Recoveries
- Laboratory Control Samples *
- Matrix Spike Recoveries *
- Matrix Duplicate RPDs *
- Serial Dilutions *
- Field Duplicates *
- Identification/Quantitation *
- Reporting Limits *

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. *If an issue is not addressed in this narrative there were no actions required based on unmet quality control criteria.*

PCBs

No critical findings resulting in data rejections were noted. Some major findings resulting in qualification of data as estimated were noted. The majority of the data is reported without qualification.

Qualifications were required based on non-compliant surrogate recoveries.

One sample was re-extracted outside of the holding time. The sample was excluded in favor of the results reported in the original analysis of the sample.

Select Metals Pb & Zn

Three samples exhibited high (>50%) moisture content. All reported results in these three samples were qualified as estimated J/UJ.

Specific Evaluation of Data

Data Completeness

The SDG was received complete and intact. Updated MS/MSD results forms that included the client sample ID were requested and received from the laboratory.

Technical Holding Times

According to chain of custody records, sampling was performed on 8/4-5/14 and samples were received at the laboratory 8/6/14. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the following exception.

PCBs

Sample VWW06-SD031-0006 was re-extracted on the 29th day after sampling. The RE of the sample is excluded in favor of the results reported from the initial analysis of the sample.

Sample Condition

Select Metals, Pb & Zn

Samples VWW06-SD030-0006, VWW06-SD031-0006 and VWW06-SD032-0006 exhibited low solids content (<50%) as noted in the following table. All reported results were qualified as estimated J/UJ based on the Region II guidance.

Sample ID	%Solids	Q Flag	Q Code
VWW06-SD030-0006	41.32	J/UJ	OT
VWW06-SD031-0006	45.45		
VWW06-SD032-0006	47.53		

Surrogate Recoveries

PCBs

Several samples exhibited non-compliant recoveries as noted in the following table. Results required qualifications as noted.

Sample ID	Surrogate	%R	QC Limits	Q Flag	Q Code
VWW06-SD030-4854	TCMX	67.2/65.7	70-125	J-/UJ	SSL
VWW06-SD030-7278	TCMX	63.3/65.2	70-125		
VWW06-SD031-0006	TCMX DCB	62.1/63.0 59.8	70-125 60-125		
VWW06-SD031-7278	TCMX	63.8/66.5	70-125		
VWW06-SD032P-4854	TCMX	62.0/64.0	70-125		

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Jacqueline Cleveland

Jacqueline Cleveland
Vice President

Summary of Data Qualifications

PCBs

Sample ID	Compounds	Results	Q Flag	Q Code
VWW06-SD031-0006RE	all compounds	+/-	exclude	RE
VWW06-SD030-4854, VWW06-SD030-7278, VWW06-SD031-0006, VWW06-SD031-7278 VWW06-SD032P-4854	all compounds	+/-	J/UJ	SSL

Select Metals – Pb & Zn

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-SD030-0006, VWW06-SD031-0006, VWW06-SD032-0006	all analytes	+/-	J/UJ	OT

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
J+	estimated biased high
J-	estimated biased low
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the LOD (2X sample LOD for common laboratory contaminants) when the blank value is less than the LOD. The sample result for the blank contaminant is not qualified with any blank qualifiers.
LOD	The sample result for the blank contaminant is less than the LOD (2X sample LOD for common laboratory contaminants) but greater than the MDL when the blank value is less than the LOD. The sample result for the blank contaminant is changed to the LOD and qualified as non-detect U.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the ICB/CCB/PB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the LOD.
J+ -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the LOD.
J/UJ -	Sample result is less than 10X LOD when blank result is below the negative LOD.

Glossary of Qualification Flags and Abbreviations, continued

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.

Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD when the FB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the FB value when the FB value is greater than the LOD.
J+ -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the LOD.

General Abbreviations

MDL	method detection limit
IDL	instrument detection limit
LOD/RL	Level of Detection//Reporting Limit
LOQ	Level of Quantitation
+	positive result
-	non-detect result

ANALYSIS DATA SHEET

VWW06-SD029-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-01	File ID:	051R5101.D
Sampled:	08/04/14 09:35	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 00:02
Solids:	60.79	Preparation:	EXT 3546	Dilution:	1
Batch:	4H08017	Sequence: 4H24005	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	25.6	13.4	17.9	53.7	J
12674-11-2	Aroclor-1016 [2C]		6.72	13.4	26.9	U
11104-28-2	Aroclor-1221		6.72	13.4	26.9	U
11141-16-5	Aroclor-1232		6.72	13.4	26.9	U
53469-21-9	Aroclor-1242		13.4	13.4	26.9	U
12672-29-6	Aroclor-1248		6.72	13.4	26.9	U
11097-69-1	Aroclor-1254 [2C]	25.6	6.72	13.4	26.9	J
11096-82-5	Aroclor-1260		6.72	13.4	26.9	U
37324-23-5	Aroclor-1262		6.72	13.4	26.9	U
11100-14-4	Aroclor-1268		6.72	13.4	26.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.88	21.07	78.4	70 - 125	
Tetrachloro-m-xylene [2C]	26.88	21.65	80.5	70 - 125	
Decachlorobiphenyl	26.88	22.29	82.9	60 - 125	
Decachlorobiphenyl [2C]	26.88	23.78	88.5	60 - 125	

JMC 10/31/14

ANALYSIS DATA SHEET

VWW06-SD029-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-02	File ID:	052R5201.D
Sampled:	08/04/14 09:40	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 00:16
Solids:	53.45	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08017	Sequence:	4H24005	Calibration:	4232001
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.9	19.8	59.4	U
12674-11-2	Aroclor-1016		7.44	14.9	29.8	U
11104-28-2	Aroclor-1221		7.44	14.9	29.8	U
11141-16-5	Aroclor-1232		7.44	14.9	29.8	U
53469-21-9	Aroclor-1242		7.44	14.9	29.8	U
12672-29-6	Aroclor-1248		7.44	14.9	29.8	U
11097-69-1	Aroclor-1254		7.44	14.9	29.8	U
11096-82-5	Aroclor-1260		7.44	14.9	29.8	U
37324-23-5	Aroclor-1262		7.44	14.9	29.8	U
11100-14-4	Aroclor-1268		7.44	14.9	29.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.75	23.68	79.6	70 - 125	
Tetrachloro-m-xylene [2C]	29.75	24.06	80.9	70 - 125	
Decachlorobiphenyl	29.75	25.27	84.9	60 - 125	
Decachlorobiphenyl [2C]	29.75	26.61	89.4	60 - 125	

SAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD029-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-03	File ID:	053F5301.D
Sampled:	08/04/14 09:45	Prepared:	08/14/14 09:52	Anaryzed:	08/25/14 00:31
Solids:	67.13	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08017	Sequence: 4H24005	Calibration:	4232001	Instrument: GL-ECD3

CAS NO	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		12.4	16.5	49.5	U
12674-11-2	Aroclor-1016		6.20	12.4	24.8	U
11104-28-2	Aroclor-1221		6.20	12.4	24.8	U
11141-16-5	Aroclor-1232		6.20	12.4	24.8	U
53469-21-9	Aroclor-1242		6.20	12.4	24.8	U
12672-29-6	Aroclor-1248		6.20	12.4	24.8	U
11097-69-1	Aroclor-1254		6.20	12.4	24.8	U
11096-82-5	Aroclor-1260		6.20	12.4	24.8	U
37324-23-5	Aroclor-1262		6.20	12.4	24.8	U
11100-14-4	Aroclor-1268		6.20	12.4	24.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	24.78	19.72	79.6	70 - 125	
Tetrachloro-m-xylene [2C]	24.78	19.91	80.4	70 - 125	
Decachlorobiphenyl	24.78	20.03	80.8	60 - 125	
Decachlorobiphenyl [2C]	24.78	21.08	85.1	60 - 125	

10/13/14

010

ANALYSIS DATA SHEET

VWW06-SD029-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-04	File ID:	056F5601.D
Sampled:	08/04/14 09:50	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 01:15
Solids:	72.45	Preparation:	EXT 3546	Dilution:	1
Batch:	4H08017	Sequence:	4H24005	Calibration:	4232001
Instrument:	GL-ECD3				

CAS NO	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.1	14.8	44.4	U
12674-11-2	Aroclor-1016		5.56	11.1	22.3	U
11104-28-2	Aroclor-1221		5.56	11.1	22.3	U
11141-16-5	Aroclor-1232		5.56	11.1	22.3	U
53469-21-9	Aroclor-1242		5.56	11.1	22.3	U
12672-29-6	Aroclor-1248		5.56	11.1	22.3	U
11097-69-1	Aroclor-1254		5.56	11.1	22.3	U
11096-82-5	Aroclor-1260		5.56	11.1	22.3	U
37324-23-5	Aroclor-1262		5.56	11.1	22.3	U
11100-14-4	Aroclor-1268		5.56	11.1	22.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	22.22	17.36	78.1	70 - 125	
Tetrachloro-m-xylene [2C]	22.22	17.95	80.8	70 - 125	
Decachlorobiphenyl	22.22	17.92	80.7	60 - 125	
Decachlorobiphenyl [2C]	22.22	18.75	84.4	60 - 125	

10/13/14

ANALYSIS DATA SHEET

VWW06-SD030-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-05	File ID:	062R6201.D
Sampled:	08/04/14 10:40	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 02:42
Solids:	41.32	Preparation:	EXT 3546	Dilution:	1
Batch:	4H08017	Sequence: 4H24005	Calibration:	4232001	Instrument: GL-ECD3

CAS NO	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	57.5	19.3	25.8	77.3	J
12674-11-2	Aroclor-1016 [2C]		9.68	19.3	38.8	U
11104-28-2	Aroclor-1221		9.68	19.3	38.8	U
11141-16-5	Aroclor-1232		9.68	19.3	38.8	U
53469-21-9	Aroclor-1242 [2C]		9.68	19.3	38.8	U
12672-29-6	Aroclor-1248		9.68	19.3	38.8	U
11097-69-1	Aroclor-1254	57.5	9.68	19.3	38.8	
11096-82-5	Aroclor-1260		9.68	19.3	38.8	U
37324-23-5	Aroclor-1262		9.68	19.3	38.8	U
11100-14-4	Aroclor-1268		9.68	19.3	38.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	38.71	31.01	80.1	70 - 125	
Tetrachloro-m-xylene [2C]	38.71	31.29	80.8	70 - 125	
Decachlorobiphenyl	38.71	29.68	76.7	60 - 125	
Decachlorobiphenyl [2C]	38.71	31.89	82.4	60 - 125	

JLC 10/23/14

012

ANALYSIS DATA SHEET

VWW06-SD030-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-06	File ID:	063F6301.D
Sampled:	08/04/14 10:45	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 02:57
Solids:	52.24	Preparation:	EXT 3546	Dilution:	1

Batch: 4H08017 Sequence: 4H24005 Calibration: 4232001 Instrument: GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.6	20.8	62.3	U
12674-11-2	Aroclor-1016		7.81	15.6	31.3	U
11104-28-2	Aroclor-1221		7.81	15.6	31.3	U
11141-16-5	Aroclor-1232		7.81	15.6	31.3	U
53469-21-9	Aroclor-1242		7.81	15.6	31.3	U
12672-29-6	Aroclor-1248		7.81	15.6	31.3	U
11097-69-1	Aroclor-1254		7.81	15.6	31.3	U
11096-82-5	Aroclor-1260		7.81	15.6	31.3	U
37324-23-5	Aroclor-1262		7.81	15.6	31.3	U
11100-14-4	Aroclor-1268		7.81	15.6	31.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.20	25.90	83.0	70 - 125	
Tetrachloro-m-xylene [2C]	31.20	26.42	84.7	70 - 125	
Decachlorobiphenyl	31.20	24.83	79.6	60 - 125	
Decachlorobiphenyl [2C]	31.20	26.53	85.0	60 - 125	

SAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD030-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-07	File ID:	064F6401.D
Sampled:	08/04/14 10:50	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 03:11
Solids:	71.05	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08017	Sequence:	4H24005	Calibration:	4232001
Instrument:	GL-ECD3				

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.3	15.0	45.0	UJ
12674-11-2	Aroclor-1016		5.63	11.3	22.6	U
11104-28-2	Aroclor-1221		5.63	11.3	22.6	U
11141-16-5	Aroclor-1232		5.63	11.3	22.6	U
53469-21-9	Aroclor-1242		5.63	11.3	22.6	U
12672-29-6	Aroclor-1248		5.63	11.3	22.6	U
11097-69-1	Aroclor-1254		5.63	11.3	22.6	U
11096-82-5	Aroclor-1260		5.63	11.3	22.6	U
37324-23-5	Aroclor-1262		5.63	11.3	22.6	U
11100-14-4	Aroclor-1268		5.63	11.3	22.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	22.51	15.13	67.2	70 - 125	
Tetrachloro-m-xylene [2C]	22.51	15.49	68.8	70 - 125	
Decachlorobiphenyl	22.51	15.58	69.2	60 - 125	
Decachlorobiphenyl [2C]	22.51	16.70	74.2	60 - 125	

10/13/14

014

ANALYSIS DATA SHEET

VWW06-SD030P-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-08	File ID:	065F6501.D
Sampled:	08/04/14 10:55	Prepared:	08/14/14 09:32	Analyzed:	08/25/14 03:26
Solids:	71.07	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08017	Sequence:	4H24005	Calibration:	4232001
Instrument:	GC-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.7	15.6	46.8	U
12674-11-2	Aroclor-1016		5.86	11.7	23.5	U
11104-28-2	Aroclor-1221		5.86	11.7	23.5	U
11141-16-5	Aroclor-1232		5.86	11.7	23.5	U
53469-21-9	Aroclor-1242		5.86	11.7	23.5	U
12672-29-6	Aroclor-1248		5.86	11.7	23.5	U
11097-69-1	Aroclor-1254		5.86	11.7	23.5	U
11096-82-5	Aroclor-1260		5.86	11.7	23.5	U
37324-23-5	Aroclor-1262		5.86	11.7	23.5	U
11100-14-4	Aroclor-1268		5.86	11.7	23.5	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	23.43	16.66	71.1	70 - 125	
Tetrachloro-m-xylene [2C]	23.43	17.04	72.7	70 - 125	
Decachlorobiphenyl	23.43	17.18	73.3	60 - 125	
Decachlorobiphenyl [2C]	23.43	18.31	78.1	60 - 125	

JC 10/3/14

ANALYSIS DATA SHEET

VWW06-SD030-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-09	File ID:	066F6601.D
Sampled:	08/04/14 11:00	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 03:41
Solids:	68.95	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08017	Sequence: 4H24005	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.9	15.8	47.4	U
12674-11-2	Aroclor-1016		5.94	11.9	23.8	U
11104-28-2	Aroclor-1221		5.94	11.9	23.8	U
11141-16-5	Aroclor-1232		5.94	11.9	23.8	U
53469-21-9	Aroclor-1242		5.94	11.9	23.8	U
12672-29-6	Aroclor-1248		5.94	11.9	23.8	U
11097-69-1	Aroclor-1254		5.94	11.9	23.8	U
11096-82-5	Aroclor-1260		5.94	11.9	23.8	U
37324-23-5	Aroclor-1262		5.94	11.9	23.8	U
11100-14-4	Aroclor-1268		5.94	11.9	23.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	23.73	15.01	63.3	70 - 125	
Tetrachloro-m-xylene [2C]	23.73	15.48	65.2	70 - 125	
Decachlorobiphenyl	23.73	16.22	68.3	60 - 125	
Decachlorobiphenyl [2C]	23.73	17.34	73.1	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD031-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-10	File ID:	067R6701.D
Sampled:	08/04/14 12:05	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 03:55
Solids:	45.45	Preparation:	EXT 3546	Dilution:	1
Batch:	4H08017	Sequence: 4H24005	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	108	17.7	23.6	70.7	J- SSL
12674-11-2	Aroclor-1016 [2C]		17.7	17.7	35.4	UJ U
11104-28-2	Aroclor-1221		8.85	17.7	35.4	U
11141-16-5	Aroclor-1232		8.85	17.7	35.4	U
53469-21-9	Aroclor-1242 [2C]		17.7	17.7	35.4	U
12672-29-6	Aroclor-1248		8.85	17.7	35.4	U
11097-69-1	Aroclor-1254 [2C]	108	8.85	17.7	35.4	J-
11096-82-5	Aroclor-1260		8.85	17.7	35.4	UJ U
37324-23-5	Aroclor-1262		8.85	17.7	35.4	U
11100-14-4	Aroclor-1268		8.85	17.7	35.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	35.38	21.96	62.1	70 - 125	
Tetrachloro-m-xylene [2C]	35.38	22.30	63.0	70 - 125	
Decachlorobiphenyl	35.38	21.17	59.8	60 - 125	
Decachlorobiphenyl [2C]	35.38	23.38	66.1	60 - 125	

JAC 10/23/14

ANALYSIS DATA SHEET

VWW06-SD031-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-10RE1	File ID:	013R1301.D
Sampled:	08/04/14 12:05	Prepared:	09/02/14 11:35	Analyzed:	09/04/14 16:03
Solids:	45.45	Preparation:	EXT_3546	Dilution:	1
Batch:	4102013	Sequence: 4125101	Calibration:	4232001	Instrument: GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	32.5	17.8	23.7	71.1	H2PJ
12674-11-2	Aroclor-1016		8.90	17.8	35.7	H2U
11104-28-2	Aroclor-1221		8.90	17.8	35.7	H2U
11141-16-5	Aroclor-1232		8.90	17.8	35.7	H2U
53469-21-9	Aroclor-1242		8.90	17.8	35.7	H2U
12672-29-6	Aroclor-1248		8.90	17.8	35.7	H2U
11097-69-1	Aroclor-1254 [2C]	32.5	8.90	17.8	35.7	H2PJ
11096-82-5	Aroclor-1260		8.90	17.8	35.7	H2U
37324-23-5	Aroclor-1262		8.90	17.8	35.7	H2U
11100-14-4	Aroclor-1268		8.90	17.8	35.7	H2U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	35.58	19.95	56.1	70 - 125	*H2
Tetrachloro-m-xylene [2C]	35.58	20.25	56.9	70 - 125	*H2
Decachlorobiphenyl	35.58	13.36	37.6	60 - 125	*H2
Decachlorobiphenyl [2C]	35.58	14.68	41.2	60 - 125	*H2

RE

018

ANALYSIS DATA SHEET

VWW06-SD031-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-11	File ID:	068R6801.D
Sampled:	08/04/14 12:10	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 04:10
Solids:	53.99	Preparation:	EXT: 3546	Dilution:	1
Batch:	4H08017	Sequence:	4H24005	Calibration:	4232001
Instrument:	GC-ECD3				

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.6	19.5	58.5	U
12674-11-2	Aroclor-1016		7.32	14.6	29.3	U
11104-28-2	Aroclor-1221		7.32	14.6	29.3	U
11141-16-5	Aroclor-1232		7.32	14.6	29.3	U
53469-21-9	Aroclor-1242		7.32	14.6	29.3	U
12672-29-6	Aroclor-1248		7.32	14.6	29.3	U
11097-69-1	Aroclor-1254		7.32	14.6	29.3	U
11096-82-5	Aroclor-1260		7.32	14.6	29.3	U
37324-23-5	Aroclor-1262		7.32	14.6	29.3	U
11100-14-4	Aroclor-1268		7.32	14.6	29.3	U

SYSTEM MONITORING COMPOUND	ADDED (mg/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.27	23.85	81.5	70 - 125	
Tetrachloro-m-xylene [2C]	29.27	24.44	83.5	70 - 125	
Decachlorobiphenyl	29.27	23.93	81.8	60 - 125	
Decachlorobiphenyl [2C]	29.27	25.64	87.6	60 - 125	

JAC 101314

ANALYSIS DATA SHEET

VWW06-SD031-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-12	File ID:	069F6901.D
Sampled:	08/04/14 12:15	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 04:24
Solids:	52.15	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08017	Sequence: 4H24005	Calibration:	4232001	Instrument: GL-ECD1

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.2	20.2	60.6	U
12674-11-2	Aroclor-1016		7.59	15.2	30.4	U
11104-28-2	Aroclor-1221		7.59	15.2	30.4	U
11141-16-5	Aroclor-1232		7.59	15.2	30.4	U
53469-21-9	Aroclor-1242		7.59	15.2	30.4	U
12672-29-6	Aroclor-1248		7.59	15.2	30.4	U
11097-69-1	Aroclor-1254		7.59	15.2	30.4	U
11096-82-5	Aroclor-1260		7.59	15.2	30.4	U
37324-23-5	Aroclor-1262		7.59	15.2	30.4	U
11100-14-4	Aroclor-1268		7.59	15.2	30.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	30.34	23.20	76.5	70 - 125	
Tetrachloro-m-xylene (2C)	30.34	23.61	77.8	70 - 125	
Decachlorobiphenyl	30.34	24.31	80.1	60 - 125	
Decachlorobiphenyl (2C)	30.34	25.91	85.4	60 - 125	

JLC 10/31/14

020

ANALYSIS DATA SHEET

VWW06-SD031-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-13	File ID:	070F7001.D
Sampled:	08/04/14 12:20	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 04:39
Solids:	69.17	Preparation:	EXT_3546	Dilution:	1

Batch: 4H08017 Sequence: 4H24005 Calibration: 4232001 Instrument: GL-ECD3

CAS NO	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.9	15.8	47.5	~~U~~ U SSL
12674-11-2	Aroclor-1016		5.95	11.9	23.8	U
11104-28-2	Aroclor-1221		5.95	11.9	23.8	U
11141-16-5	Aroclor-1232		5.95	11.9	23.8	U
53469-21-9	Aroclor-1242		5.95	11.9	23.8	U
12672-29-6	Aroclor-1248		5.95	11.9	23.8	U
11097-69-1	Aroclor-1254		5.95	11.9	23.8	U
11096-82-5	Aroclor-1260		5.95	11.9	23.8	U
37324-23-5	Aroclor-1262		5.95	11.9	23.8	U
11100-14-4	Aroclor-1268		5.95	11.9	23.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	23.76	15.16	63.8	70 - 125	
Tetrachloro-m-xylene [2C]	23.76	15.80	66.5	70 - 125	
Decachlorobiphenyl	23.76	16.27	68.5	60 - 125	
Decachlorobiphenyl [2C]	23.76	17.40	73.2	60 - 125	

JC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD032-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID: 1408028-14		File ID:	076R7601.D
Sampled:	08/04/14 13:15	Prepared: 08/14/14 09:52		Analyzed:	08/25/14 06:06
Solids:	47.53	Preparation: EXT 3546		Dilution:	1
Batch:	4H08017	Sequence: 4H24005	Calibration: 4232001	Instrument:	GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	37.9	16.8	22.4	67.2	J
12674-11-2	Aroclor-1016 [2C]		8.41	16.8	33.7	U
11104-28-2	Aroclor-1221		8.41	16.8	33.7	U
11141-16-5	Aroclor-1232		8.41	16.8	33.7	U
53469-21-9	Aroclor-1242 [2C]		8.41	16.8	33.7	U
12672-29-6	Aroclor-1248		8.41	16.8	33.7	U
11097-69-1	Aroclor-1254	37.9	8.41	16.8	33.7	
11096-82-5	Aroclor-1260		8.41	16.8	33.7	U
37324-23-5	Aroclor-1262		8.41	16.8	33.7	U
11100-14-4	Aroclor-1268		8.41	16.8	33.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	33.61	24.66	73.4	70 - 125	
Tetrachloro-m-xylene [2C]	33.61	25.09	74.7	70 - 125	
Decachlorobiphenyl	33.61	23.82	70.9	60 - 125	
Decachlorobiphenyl [2C]	33.61	25.90	77.1	60 - 125	

JBC 10/13/14

022

ANALYSIS DATA SHEET

VWW06-SD032-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-15	File ID:	077F7701.D
Sampled:	08/04/14 13:20	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 06:21
Solids:	69.07	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08017	Sequence: 4H24005	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.3	15.1	45.3	U
12674-11-2	Aroclor-1016		5.67	11.3	22.7	U
11104-28-2	Aroclor-1221		5.67	11.3	22.7	U
11141-16-5	Aroclor-1232		5.67	11.3	22.7	U
53469-21-9	Aroclor-1242		5.67	11.3	22.7	U
12672-29-6	Aroclor-1248		5.67	11.3	22.7	U
11097-69-1	Aroclor-1254		5.67	11.3	22.7	U
11096-82-5	Aroclor-1260		5.67	11.3	22.7	U
37324-23-5	Aroclor-1262		5.67	11.3	22.7	U
11100-14-4	Aroclor-1268		5.67	11.3	22.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	22.66	16.00	70.6	70 - 125	
Tetrachloro-m-xylene [2C]	22.66	16.34	72.1	70 - 125	
Decachlorobiphenyl	22.66	16.52	72.9	60 - 125	
Decachlorobiphenyl [2C]	22.66	17.77	78.4	60 - 125	

JC 10/31/14

ANALYSIS DATA SHEET

VWW06-SD032-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-16	File ID:	078F7801.D
Sampled:	08/04/14 13:25	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 06:35
Solids:	66.59	Preparation:	EXT 3546	Dilution:	1
Batch:	4H08017	Sequence:	4H24005	Calibration:	4232001

Instrument: GL-ECD3

CAS NO	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.9	15.8	47.4	U
12674-11-2	Aroclor-1016		5.93	11.9	23.8	U
11104-28-2	Aroclor-1221		5.93	11.9	23.8	U
11141-16-5	Aroclor-1232		5.93	11.9	23.8	U
53469-21-9	Aroclor-1242		5.93	11.9	23.8	U
12672-29-6	Aroclor-1248		5.93	11.9	23.8	U
11097-69-1	Aroclor-1254		5.93	11.9	23.8	U
11096-82-5	Aroclor-1260		5.93	11.9	23.8	U
37324-23-5	Aroclor-1262		5.93	11.9	23.8	U
11100-14-4	Aroclor-1268		5.93	11.9	23.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	23.72	16.68	70.3	70 - 125	
Tetrachloro-m-xylene [2C]	23.72	17.14	72.3	70 - 125	
Decachlorobiphenyl	23.72	17.53	73.9	60 - 125	
Decachlorobiphenyl [2C]	23.72	18.83	79.4	60 - 125	

10/23/14

024

ANALYSIS DATA SHEET

VWW06-SD032P-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-17	File ID:	079F7901.D
Sampled:	08/04/14 13:30	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 06:50
Solids:	67.46	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08017	Sequence: 4H24005	Calibration:	4232001	Instrument: QL-ECD3

CAS NO	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		12.0	16.0	48.0	UJ U SSL
12674-11-2	Aroclor-1016		6.01	12.0	24.1	U
11104-28-2	Aroclor-1221		6.01	12.0	24.1	U
11141-16-5	Aroclor-1232		6.01	12.0	24.1	U
53469-21-9	Aroclor-1242		6.01	12.0	24.1	U
12672-29-6	Aroclor-1248		6.01	12.0	24.1	U
11097-69-1	Aroclor-1254		6.01	12.0	24.1	U
11096-82-5	Aroclor-1260		6.01	12.0	24.1	U
37324-23-5	Aroclor-1262		6.01	12.0	24.1	U
11100-14-4	Aroclor-1268		6.01	12.0	24.1	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	24.02	14.90	62.0	70 - 125	
Tetrachloro-m-xylene [2C]	24.02	15.37	64.0	70 - 125	
Decachlorobiphenyl	24.02	16.48	68.6	60 - 125	
Decachlorobiphenyl [2C]	24.02	17.59	73.2	60 - 125	

SSL 10/13/14

ANALYSIS DATA SHEET

VWW06-SD032-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408028-18	File ID:	080F8001.D
Sampled:	08/04/14 13:35	Prepared:	08/14/14 09:52	Analyzed:	08/25/14 07:05
Solids:	70.74	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08017	Sequence:	4H24005	Calibration:	4232001
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.8	15.7	47.0	U
12674-11-2	Aroclor-1016		5.89	11.8	23.6	U
11104-28-2	Aroclor-1221		5.89	11.8	23.6	U
11141-16-5	Aroclor-1232		5.89	11.8	23.6	U
53469-21-9	Aroclor-1242		5.89	11.8	23.6	U
12672-29-6	Aroclor-1248		5.89	11.8	23.6	U
11097-69-1	Aroclor-1254		5.89	11.8	23.6	U
11096-82-5	Aroclor-1260		5.89	11.8	23.6	U
37324-23-5	Aroclor-1262		5.89	11.8	23.6	U
11100-14-4	Aroclor-1268		5.89	11.8	23.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	23.53	16.73	71.1	70 - 125	
Tetrachloro-m-xylene [2C]	23.53	17.13	72.8	70 - 125	
Decachlorobiphenyl	23.53	17.25	73.3	60 - 125	
Decachlorobiphenyl [2C]	23.53	18.50	78.6	60 - 125	

JAC 10/31/14

026

ANALYSIS DATA SHEET

VWW06-EB01-080514

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Water	Laboratory ID:	1408028-19	File ID:	040F4001.D
Sampled:	08/05/14 06:45	Prepared:	08/08/14 17:51	Analyzed:	08/11/14 19:41
Solids:		Preparation:	EXT_3510	Dilution:	1
Batch:	4H07026	Sequence:	4H22502	Calibration:	4209006
Instrument:	GL-ECD3				

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
NA	Total PCBs		0.111	0.231	0.463	U
12674-11-2	Aroclor-1016		0.111	0.231	0.463	U
11104-28-2	Aroclor-1221		0.111	0.231	0.463	U
11141-16-5	Aroclor-1232		0.111	0.231	0.463	U
53469-21-9	Aroclor-1242		0.111	0.231	0.463	U
12672-29-6	Aroclor-1248		0.111	0.231	0.463	U
11097-69-1	Aroclor-1254		0.111	0.231	0.463	U
11096-82-5	Aroclor-1260		0.111	0.231	0.463	U
37324-23-5	Aroclor-1262		0.111	0.231	0.463	U
11100-14-4	Aroclor-1268		0.111	0.231	0.463	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	0.4630	0.3425	74.0	25 - 140	
Tetrachloro-m-xylene [2C]	0.4630	0.3573	77.2	25 - 140	
Decachlorobiphenyl	0.4630	0.3332	72.0	40 - 135	
Decachlorobiphenyl [2C]	0.4630	0.3470	75.0	40 - 135	

JAC 10/13/14

027

ANALYSIS DATA SHEET

VWW06-SD029-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H08017-MS1	File ID:	054F5401.D
Sampled:		Prepared:		Analyzed:	08/25/14 00:46
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H08017 Sequence: 4I124005 Calibration: 4232001 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		6.10	12.2	24.4	U
11104-28-2	Aroclor-1221		6.10	12.2	24.4	U
11141-16-5	Aroclor-1232		6.10	12.2	24.4	U
53469-21-9	Aroclor-1242		6.10	12.2	24.4	U
12672-29-6	Aroclor-1248		6.10	12.2	24.4	U
11097-69-1	Aroclor-1254	338.4	6.10	12.2	24.4	
11096-82-5	Aroclor-1260		6.10	12.2	24.4	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	24.39	17.97	73.7	70 - 125	
Decachlorobiphenyl	24.39	18.55	76.1	60 - 125	

10/27/14

028

ANALYSIS DATA SHEET

VWW06-SD029-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	41108017-MS1	File ID:	054R5401.D
Sampled:		Prepared:		Analyzed:	08/25/14 00:46
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 41108017 Sequence: 41124005 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		6.10	12.2	24.4	U
11104-28-2	Aroclor-1221 [2C]		6.10	12.2	24.4	U
11141-16-5	Aroclor-1232 [2C]		6.10	12.2	24.4	U
53469-21-9	Aroclor-1242 [2C]		6.10	12.2	24.4	U
12672-29-6	Aroclor-1248 [2C]		6.10	12.2	24.4	U
11097-69-1	Aroclor-1254 [2C]	**379.8**	6.10	12.2	24.4	
11096-82-5	Aroclor-1260 [2C]		6.10	12.2	24.4	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	24.39	18.29	75.0	70 - 125	
Decachlorobiphenyl [2C]	24.39	19.49	79.9	60 - 125	

JAC 10/27/14

ANALYSIS DATA SHEET

VWW06-SD031-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H08017-MS2	File ID:	071F7101.D
Sampled:		Prepared:		Analyzed:	08/25/14 04:53
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H08017 Sequence: 4H24005 Calibration: 4232001 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		6.00	12.0	24.0	U
11104-28-2	Aroclor-1221		6.00	12.0	24.0	U
11141-16-5	Aroclor-1232		6.00	12.0	24.0	U
53469-21-9	Aroclor-1242		6.00	12.0	24.0	U
12672-29-6	Aroclor-1248		6.00	12.0	24.0	U
11097-69-1	Aroclor-1254	380.7	6.00	12.0	24.0	
11096-82-5	Aroclor-1260		6.00	12.0	24.0	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	24.00	19.68	82.0	70 - 125	
Decachlorobiphenyl	24.00	21.01	87.5	60 - 125	

JLC 10/27/14

ANALYSIS DATA SHEET

VWW06-SD031-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	41108017-MS2	File ID:	071R7101.D
Sampled:		Prepared:		Analyzed:	08/25/14 04:55
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 41108017 Sequence: 41124005 Calibration: 4232001 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		6.00	12.0	24.0	U
11104-28-2	Aroclor-1221 [2C]		6.00	12.0	24.0	U
11141-16-5	Aroclor-1232 [2C]		6.00	12.0	24.0	U
53469-21-9	Aroclor-1242 [2C]		6.00	12.0	24.0	U
12672-29-6	Aroclor-1248 [2C]		6.00	12.0	24.0	U
11097-69-1	Aroclor-1254 [2C]	437.3	6.00	12.0	24.0	
11096-82-5	Aroclor-1260 [2C]		6.00	12.0	24.0	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC. (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	24.00	20.06	83.6	70 - 125	
Decachlorobiphenyl [2C]	24.00	22.26	92.7	60 - 125	

JKC 10/27/14

031

ANALYSIS DATA SHEET

VWW06-SD029-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWM016	
Matrix:		Laboratory ID:	4H08017-MSD1	File ID:	055F5501.D
Sampled:		Prepared:		Analyzed:	08/25/14 01:00
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H08017 Sequence: 4H24005 Calibration: 4232001 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		5.94	11.9	23.8	U
11104-28-2	Aroclor-1221		5.94	11.9	23.8	U
11141-16-5	Aroclor-1232		5.94	11.9	23.8	U
53469-21-9	Aroclor-1242		5.94	11.9	23.8	U
12672-29-6	Aroclor-1248		5.94	11.9	23.8	U
11097-69-1	Aroclor-1254	294.1	5.94	11.9	23.8	
11096-82-5	Aroclor-1260		5.94	11.9	23.8	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	23.74	15.14	63.8	70 - 125	
Decachlorobiphenyl	23.74	16.60	69.9	60 - 125	

032

ANALYSIS DATA SHEET

VWW06-SD029-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H08017-MSD1	File ID:	055R5501.D
Sampled:		Prepared:		Analyzed:	08/25/14 01:00
Solids:		Preparation:	EXT_354b	Dilution:	

Batch: 4H08017 Sequence: 4H24005 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		5.94	11.9	23.8	U
11104-28-2	Aroclor-1221 [2C]		5.94	11.9	23.8	U
11141-16-5	Aroclor-1232 [2C]		5.94	11.9	23.8	U
53469-21-9	Aroclor-1242 [2C]		5.94	11.9	23.8	U
12672-29-6	Aroclor-1248 [2C]		5.94	11.9	23.8	U
11097-69-1	Aroclor-1254 [2C]	337.7	5.94	11.9	23.8	
11096-82-5	Aroclor-1260 [2C]		5.94	11.9	23.8	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	23.74	15.60	65.7	70 - 125	
Decachlorobiphenyl [2C]	23.74	17.42	73.4	60 - 125	

SAC 10/27/14

033

ANALYSIS DATA SHEET

VWW06-SD031-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	41108017-MSD2	File ID:	072F7201.D
Sampled:		Prepared:		Analyzed:	08/25/14 05:08
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 41108017 Sequence: 41124005 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		5.70	11.4	22.8	U
11104-28-2	Aroclor-1221		5.70	11.4	22.8	U
11141-16-5	Aroclor-1232		5.70	11.4	22.8	U
53469-21-9	Aroclor-1242		5.70	11.4	22.8	U
12672-29-6	Aroclor-1248		5.70	11.4	22.8	U
11097-69-1	Aroclor-1254	307.1	5.70	11.4	22.8	
11096-82-5	Aroclor-1260		5.70	11.4	22.8	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	22.77	15.91	69.9	70 - 125	
Decachlorobiphenyl	22.77	17.77	78.0	60 - 125	

JLC 10/7/14

034

ANALYSIS DATA SHEET

VWW06-SD031-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408028	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H08017-MSD2	File ID:	072R7201.D
Sampled:		Prepared:		Analyzed:	08/25/14 05:08
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 41408017 Sequence: 4H24005 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		5.70	11.4	22.8	U
11104-28-2	Aroclor-1221 [2C]		5.70	11.4	22.8	U
11141-16-5	Aroclor-1232 [2C]		5.70	11.4	22.8	U
53469-21-9	Aroclor-1242 [2C]		5.70	11.4	22.8	U
12672-29-6	Aroclor-1248 [2C]		5.70	11.4	22.8	U
11097-69-1	Aroclor-1254 [2C]	**346.2**	5.70	11.4	22.8	
11096-82-5	Aroclor-1260 [2C]		5.70	11.4	22.8	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	22.77	16.18	71.0	70 - 125	
Decachlorobiphenyl [2C]	22.77	18.64	81.8	60 - 125	

JLC 10/27/14

T35

ANALYSIS DATA SHEET

VWW06-SD029-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/04/14 09:35
% Solids: 60.79

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-01
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	161	1.03	2.06	5.43	2	B	SW6010C	4H19024	08/29/14 15:55
7440-66-6	Zinc	178	3.43	6.85	13.7	2	B	SW6010C	4H19024	08/29/14 15:55

gjc 10/13/14

ANALYSIS DATA SHEET

VWW06-SD029-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/04/14 09:40
% Solids: 53.45

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-02
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.45	1.17	2.34	3.90	2	B	SW6010C	4H19024	08/29/14 16:00
7440-66-6	Zinc		3.90	7.80	15.6	2	U	SW6010C	4H19024	08/29/14 16:00

SMC 10/13/14

037

ANALYSIS DATA SHEET

VWW06-SD029-4854

Laboratory:	Empirical Laboratories, LLC	SDG:	1408028
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408028-03
Sampled:	08/04/14 09:45	Received:	08/06/14 08:45
% Solids:	67.13		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.13	0.466	0.921	1.35	1	J	SW6010C	4H19024	08/29/14 16:05
7440-66-6	Zinc	9.84	3.10	5.21	12.4	2	DJ	SW6010C	4H19024	08/29/14 19:38

SAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD029-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/04/14 09:50
% Solids: 72.45

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU6
Laboratory ID: 1408028-04
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	0.862	0.796	1.59	2.65	2	J[D]	SW6010C	4H19024	08/29/14 16:28
7440-66-6	Zinc	7.87	2.65	5.31	10.6	2	J[D]	SW6010C	4H19024	08/29/14 16:28

JLC 10/13/14

039

ANALYSIS DATA SHEET

VWW06-SD030-0006

Laboratory:	Empirical Laboratories, LLC	SDG:	1408028
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408028-05
Sampled:	08/04/14 10:40	Received:	08/06/14 08:45
% Solids:	41.32		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	164	1.44	2.88	4.79	2	J B QT	SW6010C	4H19024	08/29/14 16:32
7440-66-6	Zinc	231	4.79	9.58	192	2	J B QT	SW6010C	4H19024	08/29/14 16:32

JLC 10/3/14

ANALYSIS DATA SHEET

VWW06-SD030-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/04/14 10:45
% Solids: 52.24

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-06
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.25	1.14	2.27	3.79	2	JB	SW6010C	4H19024	08/29/14 16:37
7440-66-6	Zinc		3.79	7.58	15.2	2	U	SW6010C	4H19024	08/29/14 16:37

SRC 10/13/14

041

ANALYSIS DATA SHEET

VWW06-SD030-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/04/14 10:50
% Solids: 71.05

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-07
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.04	0.812	1.62	2.71	2	DJ	SW6010C	4H19024	08/29/14 16:41
7440-66-6	Zinc	8.30	2.71	5.41	10.8	2	DJ	SW6010C	4H19024	08/29/14 16:41

JAC 10/03/14

042

ANALYSIS DATA SHEET

VWW06-SD030P-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc
Matrix: Solid
Sampled: 08/04/14 10:55
% Solids: 71.07

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-08
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.26	0.851	1.71	2.84	2	BJ	SW6010C	4H19024	08/29/14 16:46
7440-66-6	Zinc	9.63	2.84	5.68	11.4	2	BJ	SW6010C	4H19024	08/29/14 16:46

SDC 10/31/14

643

ANALYSIS DATA SHEET

VWW06-SD030-7278

Laboratory:	Empirical Laboratories, LLC	SDG:	1408028
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408028-09
Sampled:	08/04/14 11:00	Received:	08/06/14 08:45
% Solids:	68.95		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.48	0.888	1.78	2.96	2	pJ	SW6010C	4H19025	08/29/14 17:27
7440-66-6	Zinc	9.99	2.96	5.92	11.8	2	pJ	SW6010C	4H19025	08/29/14 17:27

JJC 101314

ANALYSIS DATA SHEET

VWW06-SD031-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/04/14 12:05
% Solids: 45.45

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-10
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	285	1.29	2.59	4.31	2	J B	SW6010C	4H19025	08/29/14 17:31
7440-66-6	Zinc	446	4.31	8.63	17.3	2	J B	SW6010C	4H19025	08/29/14 17:31

gjc 10/3/14

045

ANALYSIS DATA SHEET

VWW06-SD031-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/04/14 12:10
% Solids: 53.99

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-11
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	10.9	1.12	2.23	2.74	2	D	SW6010C	4110025	08/29/14 17:36
7440-66-6	Zinc	81.5	3.74	7.48	15.0	2	D	SW6010C	4110025	08/29/14 17:36

JAC 101314

ANALYSIS DATA SHEET

VWW06-SD031-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/04/14 12:15
% Solids: 52.15

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-12
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.29	1.11	2.21	3.69	2	pJ	SW6010C	4H19025	08/29/14 17:40
7440-66-6	Zinc	12.8	3.69	7.37	14.7	2	pJ	SW6010C	4H19025	08/29/14 17:40

SAC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD031-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/04/14 12:20
% Solids: 69.17

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-13
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.13	0.438	0.876	1.46	1	J	SW6010C	41110023	08/27/14 23:49
7440-66-6	Zinc	8.53	2.92	5.84	11.7	2	JB	SW6010C	41110023	08/29/14 14:17

JLC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD032-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc
Matrix: Solid
Sampled: 08/04/14 13:15
% Solids: 47.53

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-14
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	273	1.25	2.50	4.17	2	J* B	SW6010C	4H19025	08/29/14 17:45
7440-66-6	Zinc	383	4.17	8.33	16.7	2	J B	SW6010C	4H19025	08/29/14 17:45

049

ANALYSIS DATA SHEET

VWW06-SD032-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/04/14 13:20
% Solids: 69.07

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-15
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.29	0.843	1.69	2.81	2	BL	SW6010C	4H19025	08/29/14 17:49
7440-66-6	Zinc	5.16	2.81	5.62	11.2	2	BL	SW6010C	4H19025	08/29/14 17:49

SJC 10/3/14

ANALYSIS DATA SHEET

VWW06-SD032-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/04/14 13:25
% Solids: 66.59

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-16
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.19	0.948	1.90	3.16	2	BJ	SW6010C	4H19025	08/29/14 17:54
7440-66-6	Zinc	10.9	3.16	6.32	12.6	2	BJ	SW6010C	4H19025	08/29/14 17:54

JLC 10/13/14

051

ANALYSIS DATA SHEET

VWW06-SD032P-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/04/14 13:30
% Solids: 67.46

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-17
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.48	0.908	1.82	3.03	2	J[1]	SW6010C	4H19025	08/29/14 17:59
7440-66-6	Zinc	9.99	3.03	6.05	12.1	2	J[1]	SW6010C	4H19025	08/29/14 17:59

JRC 10/3/14

052

ANALYSIS DATA SHEET

VWW06-SD032-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/04/14 13:35
% Solids: 70.74

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-18
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.34	0.840	1.68	2.80	2	J[J]	SW6010C	4H19025	08/29/14 18:03
7440-66-6	Zinc	7.85	2.80	5.60	11.2	2	J[J]	SW6010C	4H19025	08/29/14 18:03

SAC
10/3/14

053

ANALYSIS DATA SHEET

VWW06-EB01-080514

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Water
Sampled: 08/05/14 06:45

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408028-19
Received: 08/06/14 08:45

CAS NO.	Analyte	Conc. (ug/L)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead		1.50	3.00	5.00	1	U	SW6010C	4H18016	08/19/14 14:55
7440-66-6	Zinc		5.00	10.0	20.0	1	U	SW6010C	4H18016	08/19/14 14:55

JRC
10/13/14

ANALYSIS DATA SHEET

VWW06-SD031-7278

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 69.17

SDG: 1408028

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4H19023-MS1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	75.65	0.425	0.850	1.42	1		SW6010C	4H19023	08/27/14 23:54
7440-66-6	Zinc	172.1	1.42	2.83	5.67	1		SW6010C	4H19023	08/27/14 23:54

JLC 10/27/14

055

ANALYSIS DATA SHEET

VWW06-SD031-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
% Solids: 69.17

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 4H19023-MSD1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	79.85	0.452	0.904	1.51	1		SW6010C	4H19023	08/27/14 23:59
7440-66-6	Zinc	181.8	1.51	3.01	6.02	1		SW6010C	4H19023	08/27/14 23:59

JBC 10/27/14

056

ANALYSIS DATA SHEET

VWW06-SD031-7278

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 69.17

SDG: 1408028

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4H19023-DUP1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	ND	2.19	4.38	7.50	5	U	SW6010C	4H19023	08/28/14 00:08

GAC 10-27-14

ANALYSIS DATA SHEET

VWW06-SD031-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
% Solids: 69.17

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 4H19023-DUP2

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7440-66-6	Zinc	ND	14.6	29.2	58.4	10	U	SW6010C	4H19023	08/29/14 14:21

SPC 10/27/14

058

ANALYSIS DATA SHEET

VWW06-SD029-4854

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 67.13

SDG: 1408028

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4H19024-MS131

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	79.42	0.478	0.941	1.57	1		SW6010C	4H19024	08/29/14 16:14
7440-66-6	Zinc	183.0	1.57	3.14	6.27	1		SW6010C	4H19024	08/29/14 16:14

SAC 10/27/14

059

ANALYSIS DATA SHEET

VWW06-SD029-4854

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 67.13

SDG: 1408028

Project: NTR Vieques CTO 115 SWMU 6

Laboratory ID: 4H19024-MS1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	77.59	0.456	0.912	1.52	1		SW6010C	4H19024	08/29/14 16:09
7440-66-6	Zinc	182.3	1.52	3.04	6.09	1		SW6010C	4H19024	08/29/14 16:09

SBC 10/27/14

060

ANALYSIS DATA SHEET

VWW08-SD029-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
% Solids: 67.13

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 41119024-D17P1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	ND	2.33	4.66	7.76	5	U	SW6010C	41119024	08/29/14 16:23

SMC 102714

061

ANALYSIS DATA SHEET

VWW06-SD029-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M HILL, Inc.
Matrix: Solid
% Solids: 67.13

SDG: 1408028
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 4H19024-DUP2

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7440-66-6	Zinc	ND	15.5	31.0	62.1	10	U	SW6010C	4H19024	08/29/14 19:43

102714

062

Sample Delivery Group Case Narrative

Receipt Information:
The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision:
Revision 01: The package was revised to replace the "matrix spike", "matrix spike duplicate", and "duplicate" on the Analysis Data Sheets with the client ID of the parent sample at the request of the client.

Analytical Information:
All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. Sample preparation and dilution information is provided within the final results report and at the beginning of each form set. The following information is provided specific to individual methods:

SW8082B:
The following were extracted after the method recommended holding time of 14 days:
1408028-10RE1 was extracted 29 days after sampling; note – the sample was re-extracted due to surrogate exceedences

The following surrogates exceeded criteria:
Tetrachloro-m-xylene with a negative bias on both columns in 1408028-07, -09, -10, -10RE1, -13, -17, and 4H08017-MSD1 and on column 1 in 4H8017-MSD2
Decachlorobiphenyl with a negative bias on column 1 in 1408028-10 and on both columns in 1408028-10RE1
Note – Sample 1408028-10 was re-extracted since 3 surrogates exceeded criteria with a negative bias. Both are included in the report. Samples with less than 3 surrogates exceeding criteria were not re-extracted.

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

SW6010C:
No anomalies or deviations are noted.

Data Qualifiers:
As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

DL: The detection limit (DL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The DL is supported by the method detection limit (MDL) which is determined from analysis of a sample containing the analyte in a given matrix.

LOD: The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM 4.2 revisions as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

LOQ: The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM 4.2 as the lowest concentration that produces a quantitative result within specified limits of precision and bias.

***:** Exceeding quality control criteria are associated with the reported result.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. For Metals, the qualifier indicates that the serial dilution was outside of the control limits and the compound should be considered estimated due to the presence of interference.

H1: The result was analyzed outside of the EPA recommended holding time.

H2: The result was extracted outside of the EPA recommended holding time.

H3: The sample for this analyte was received outside of the EPA recommended holding time.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the LOQ. One should feel confident that the result is greater than zero and less than the LOQ.

064

M: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it indicates that the parameters DL/LOD/LOQ have been raised.

N: The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

Q: The relative percent difference (RPD) and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

S: The associated internal standard exceeded criteria.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.

X: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

Y: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

Z: The parameter shows lack of confirmation/detection, which may be due to a negative bias in the ICV or CCV which exceeds the lower control limit.

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

A: The peak was manually integrated as it was not integrated in the original chromatogram.

B: The peak was manually integrated due to resolution or coelution issues in the original chromatogram.

C: The peak was manually integrated to correct the baseline from the original chromatogram.

D: The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.

E: The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

LIMS Definitions / Naming Conventions:

The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

BLK: LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK

appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

BS: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

MS: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

IDs: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "**RE**" implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, the Data Quality Manager, Technical Directors or Project Managers are authorized to sign this Statement of Data Authenticity.

Mr. Rick D. Davis
Laboratory Technical Director / VP Operations

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1408028

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 • Nashville, TN 37228 • 615-345-1115 • (fax) 615-846-5426

18924

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Send Results to:
Name Juliana Dean
Company CH2M HILL
Address 5701 Cleveland Str. Suite 200
City Virginia Beach
State, Zip VA 23462
Phone 757-671-6232
Fax
E-mail juliana.dean@ch2m.com

Send Invoice to:
Name Same
Company
Address
City
State, Zip
Phone
Fax
E-mail

Project No./Name: 484427. FI. FW. SB

Sampler's (Signature):

Analysis Requirements:

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals MS 6010A/6020	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres.
01	08/04/14 0935	VWW06-SD029-0006	SD	✓	✓		2	
02	08/04/14 0940	VWW06-SD029-2430	SD	✓	✓		2	
03	08/04/14 0945	VWW06-SD029-4854	SD	✓	✓		2	
↓	08/04/14 0945	VWW06-SD029-4854-MS	SD	✓	✓		2	
↓	08/04/14 0945	VWW06-SD029-4854-SD	SD	✓	✓		2	
04	08/04/14 0950	VWW06-SD029-7278	SD	✓	✓		2	
05	08/04/14 1040	VWW06-SD030-0006	SD	✓	✓		2	
06	08/04/14 1045	VWW06-SD030-2430	SD	✓	✓		2	
07	08/04/14 1050	VWW06-SD030-4854	SD	✓	✓		2	
08	08/04/14 1055	VWW06-SD030P-4854	SD	✓	✓		2	
09	08/04/14 1100	VWW06-SD030-7278	SD	✓	✓		2	

	Date/Time	Received By: (Signature)
Sample Kit Prep'd by: (Signature)	08/05/14 0715	
Relinquished by: (Signature)	8/5/14 0715	Received By: (Signature)
Relinquished by: (Signature)	Date/Time	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time 8/6/14 0845	Temperature 0.2

REMARKS:

Details:
Page ____ of ____
Cooler No. ____ of ____
Date Shipped ____
Shipped By ____
Turnaround ____

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

1408018
~~140820~~ JTW 8/6/14

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 ♦ Nashville, TN 37228 ♦ 615-345-1115 ♦ (fax) 615-846-5426

18925

Send Results to:

Name Juliana Dean
Company CH2M HILL
Address 5701 Cleveland Str Suite 200
City Virginia Beach
State, Zip VA 23462
Phone 757-671-6232
Fax
E-mail juliana.dean@ch2m.com

Project No./Name: 404472.FI.FW.36

Send Invoice to:

Name Same
Company
Address
City
State, Zip
Phone
Fax
E-mail

Sampler's (Signature):

Analysis Requirements:

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres.
10	08/04/14 1205	VWW06-SD031-0006	SD	✓	✓		2	
11	08/04/14 1210	VWW06-SD031-2430	SD	✓	✓		2	
12	08/04/14 1215	VWW06-SD031-4854	SD	✓	✓		2	
13	08/04/14 1220	VWW06-SD031-7278	SD	✓	✓		2	
↓	08/04/14 1220	VWW06-SD031-7278MS	SD	✓	✓		2	
↓	08/04/14 1220	VWW06-SD031-7278SD	SD	✓	✓		2	
14	08/04/14 1315	VWW06-SD032-0006	SD	✓	✓		2	
15	08/04/14 1320	VWW06-SD032-2430	SD	✓	✓		2	
16	08/04/14 1325	VWW06-SD032-4854	SD	✓	✓		2	
17	08/04/14 1330	VWW06-SD032P-4854	SD	✓	✓		2	
18	08/04/14 1335	VWW06-SD032-7278	SD	✓	✓		2	
19	08/05/14 0645	VWW06-EB01-080514	W	✓	✓		3	

	Date/Time	Received By: (Signature)
Sample Kit Prep'd by: (Signature)	08/05/14 0700	
Relinquished by: (Signature)	8/5/14 1715	
Relinquished by: (Signature)		
Received for Laboratory by: (Signature)	8/6/14 0845	Temperature: 0.2

REMARKS:

Details
Page ____ of ____
Cooler No. ____ of ____
Date Shipped
Shipped By
Turnaround

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 08/06/14 0845 Workorder# JTG 8/6/14

1. Tracking # 9039 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: 0.5 °C + correction factor (-0.3) = 0.2 °C

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO (NA)

4. Were custody seals on outside of cooler? (YES) NO NA

   If yes, how many and where: 1 on Front

5. Were the seals intact, signed, and dated correctly? (YES) NO NA

6. Were custody papers inside cooler? (YES) NO NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) JTG 8/6/14

7. Were custody seals on containers: YES (NO) and intact YES NO (NA)

   Were these signed and dated correctly? YES NO (NA)

8. Packing material used? (Bubblewrap) (Plastic bag) Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: (Ice) Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES) NO NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES) NO NA

12. Did all container labels and tags agree with custody papers? (YES) NO NA

13. a. Were VOA vials received? YES (NO) NA

    b. Was there any observable headspace present in any VOA vial? YES NO (NA)

14. Was there a Trip Blank in this cooler? YES (NO) NA If multiple coolers, sequence # —

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) JTG 8/6/14

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? (YES) NO NA

    b. Did the bottle labels indicate that the correct preservatives were used (YES) NO NA

16. Was residual chlorine present? YES NO (NA)

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) JTG 8/6/14

17. Were custody papers properly filled out (ink, signed, etc)? (YES) NO NA

18. Did you sign the custody papers in the appropriate place? (YES) NO NA

19. Were correct containers used for the analysis requested? (YES) NO NA

20. Was sufficient amount of sample sent in each container? (YES) NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial/date) JTG 8/6/14

I certify that I attached a label with the unique LIMS number to each container (initial/date) JTG 8/6/14

I certify that I have performed a second check of the LIMS information against the COC to confirm accuracy (initial/date) _____

21. Were there Non-Conformance issues at login? YES (NO) Was a NCR generated? YES (NO) # _____

Additional Details:

Holding Times

Sampling Date: 8/5/14
Received Date: 8/6/14
Extraction Date: 8/14, 9/2 – PCBs
Analysis Dates: 8/25, 9/4 – PCBs

The samples in this SDG were validated according to the recommendations in the Region II SOP NO. HW-37 Rev 3, 5/2013 and the QC limits published in the project specific SAP.

Receipt paperwork was in order. Cooler temperatures were acceptable. A seven-day holding time was used for the water samples and a fourteen-day holding time was used for the soil samples. The analysis holding time of 40 days was used. Based on this, all extraction and analysis holding times were met with the exception of sample VWW06-SD031-00006RE. This sample was re-extracted at day 29.5 due to non-compliant surrogate recoveries. This sample was excluded in favor of the original analysis. Results and surrogate recoveries were similar in both analyses. All samples exhibited moisture values <30% so no qualifications were required based on Region II requirements.

Calibrations

8082 PCB: Initial calibrations were performed according to the method with a six-point curve for AR1016, AR1242, AR1254, & AR1260 as the representative PCBs. Response factors were calculated. %RSDs were within QC limits. All ICV criteria were met (avg. %Ds were met). Continuing calibration standards were analyzed appropriately (for 1016/1242 & 1260). All CCVs exhibited acceptable %Ds (avg. %Ds were met). Column resolution was acceptable. Retention times were stable throughout the analytical sequence. The correct analytical sequence was run. Raw data was verified.

Blank Summary

Blank qualification guidelines:

- No action is taken if a compound is found in the blank but not in the sample.
- Any compound detected in the sample, and the associated blank, must be qualified by reporting the result in the sample as non-detect at the LOD when the sample concentration is less than LOD.
- Sample weight, volume or dilution factor must be taken into consideration when applying the qualification criteria.
- Apply the same data validation guidelines to any associated rinse and field blanks and all associated samples.
- Qualification/Action codes:
-

No Action - The sample result is greater than the LOD and greater than five times (5X) the blank value.
U at LOD- The sample result is less than the LOD when the blank contamination level is less than the LOD.

Professional judgment is applied when blank concentrations are >LOD. Results may be flagged as U at the reported concentration or rejected. No contamination that resulted in qualification of the data was noted in the associated method or instrument blanks or the submitted field QC blanks.

Blank ID	Compound	Concentration	Action Level	Q Flag
no contamination was noted				

Surrogate Recoveries

Surrogate recoveries were acceptable for all but five samples in which qualifications were required. Samples VWW06-SD030-4854, VWW06-SD030-7278, VWW06-SD031-0006, VWW06-SD031-7278, VWW06-SD032P-4854 are qualified as estimated J-/UJ due to low surrogate recoveries.

Matrix Spike/Matrix Spike Duplicates

The MS/MSD samples analyzed for this SDG (VWW06-SD029-4854 & VWW06-SD031-7278) were acceptable for all recoveries and RPDs. No qualifications were required.

Laboratory Control Samples

The LCS samples exhibited acceptable recoveries. No qualifications were required.

Field Duplicate Sample Summary

There were two field duplicate pairs in this SDG. No positive results were reported in the pair for PCBs targets. Qualifications were not necessary.

Sample Result Verification

Reported sample results were verified. Raw data was verified. No positive results were reported in the samples.

Reviewer _____ **Date:** _____

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD030-4854
Duplicate Sample ID: VWW06-SD030P-4854

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: no positive results reported in either sample

Sample ID: VWW06-SD032-4854
Duplicate Sample ID: VWW06-SD032P-4854

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: No qualifications were required

Initial Calibration Date: 7/24-25-14, Instrument GL-ECD3

RRF and %RSD Calculations:

Compound Name: Cal3 at 750/75, Std. 14G0434, AR1660 peak 2 in level 3
Lab Value: 2054.3000

Area of Compound	1540725
Conc. of Compound	750
Calculated CF	2054.300

Compound Name: AR1260 Peak 2
Lab Value: 6.4

CF of STD 1	1883.529
CF of STD 2	1962.644
CF of STD 3	2054.300
CF of STD 4	2133.612
CF of STD 5	2036.520
CF of STD 6	2259.440
CF of STD 7	
CF of STD 8	
Calculated % RSD	6.39

Continuing Calibration File ID: 8/11/14, @ 2058, FILE id 0464601.d

RRF and %D Calculations:

Compound Name: AR1260, peak 1
Lab Value: 4389.0440

Area of Compound	4389044
Conc. of Compound	1000
Calculated CF	4389.044

Compound Name: AR1260, peak 1
Lab Value: 2.0

Average CF	4303.434
CF of CCV	4389.044
Calculated % D	-2.0

SAMPLE CALCULATION - SDG 1408028

Sample ID: VWW06-SD031-0006 (-10)
Standard ID: ICAL 7/24-25/14
Compound: AR1254
Concentration: 108 ug/Kg (average of 3 peaks)
Calculation shows Peak 1, 67.55 ug/Kg

	Water (ug/L)	Soil (ug/Kg)
Area of Compound		151270
CF of Compound		1257.331
Final Volume		5
Dilution Factor		1
Split Factor		1
Injection Volume		1
Weight of Sample	na	15.6
Initial Volume of Sample		NA
Conversion Factor		1
Percent Solids Factor		0.4545
Concentration	#DIV/0!	84.84274

Peak #	Concentration
1	84.8
2	200.6
3	47.1
4	95.3
5	109.1
Total	**107.38**

HOLDING TIME SUMMARY

SW8082A

Laboratory: Empirical Laboratories, LLC SDG: 1408028

Client: CH2M Hill, Inc Project: NTR Vieques CTO 113 SWMU 6

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
VWW06-SD029-0006	08/04/14 09:35	08/06/14 08:45	08/14/14 09:52	10.05	14.00	08/25/14 00:02	10.59	40.00	
VWW06-SD029-2430	08/04/14 09:40	08/06/14 08:45	08/14/14 09:52	10.05	14.00	08/25/14 00:16	10.60	40.00	
VWW06-SD029-4854	08/04/14 09:45	08/06/14 08:45	08/14/14 09:52	10.05	14.00	08/25/14 00:31	10.61	40.00	
VWW06-SD029-7278	08/04/14 09:50	08/06/14 08:45	08/14/14 09:52	10.04	14.00	08/25/14 01:15	10.64	40.00	
VWW06-SD030-0006	08/04/14 10:40	08/06/14 08:45	08/14/14 09:52	10.01	14.00	08/25/14 02:42	10.70	40.00	
VWW06-SD030-2430	08/04/14 10:45	08/06/14 08:45	08/14/14 09:52	10.00	14.00	08/25/14 02:57	10.71	40.00	
VWW06-SD030-4854	08/04/14 10:50	08/06/14 08:45	08/14/14 09:52	10.00	14.00	08/25/14 03:11	10.72	40.00	
VWW06-SD030P-4854	08/04/14 10:55	08/06/14 08:45	08/14/14 09:52	10.00	14.00	08/25/14 03:26	10.73	40.00	
VWW06-SD030-7278	08/04/14 11:00	08/06/14 08:45	08/14/14 09:52	9.99	14.00	08/25/14 03:41	10.74	40.00	
VWW06-SD031-0006	08/04/14 12:05	08/06/14 08:45	08/14/14 09:52	9.95	14.00	08/25/14 03:55	10.75	40.00	
VWW06-SD031-0006	08/04/14 12:05	08/06/14 08:45	09/02/14 11:35	29.02	14.00	09/04/14 16:03	2.19	40.00	* exclude for Original
VWW06-SD031-2430	08/04/14 12:10	08/06/14 08:45	08/14/14 09:52	9.95	14.00	08/25/14 04:10	10.76	40.00	
VWW06-SD031-4854	08/04/14 12:15	08/06/14 08:45	08/14/14 09:52	9.94	14.00	08/25/14 04:24	10.77	40.00	
VWW06-SD031-7278	08/04/14 12:20	08/06/14 08:45	08/14/14 09:52	9.94	14.00	08/25/14 04:39	10.78	40.00	
VWW06-SD032-0006	08/04/14 13:15	08/06/14 08:45	08/14/14 09:52	9.90	14.00	08/25/14 06:06	10.84	40.00	
VWW06-SD032-2430	08/04/14 13:20	08/06/14 08:45	08/14/14 09:52	9.90	14.00	08/25/14 06:21	10.85	40.00	
VWW06-SD032-4854	08/04/14 13:25	08/06/14 08:45	08/14/14 09:52	9.89	14.00	08/25/14 06:35	10.86	40.00	
VWW06-SD032P-4854	08/04/14 13:30	08/06/14 08:45	08/14/14 09:52	9.89	14.00	08/25/14 06:50	10.87	40.00	
VWW06-SD032-7278	08/04/14 13:35	08/06/14 08:45	08/14/14 09:52	9.89	14.00	08/25/14 07:05	10.88	40.00	
VWW06-EB01-080514	08/05/14 06:43	08/06/14 08:45	08/08/14 17:51	3.50	7.00	08/11/14 19:41	3.08	40.00	

C74

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408028
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H24005	Instrument:	GL-ECD3
		Calibration:	4232001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Matrix Spike (4H08017-MS1) ug/Kg dry				Lab File ID: 054F5401.D		Analyzed: 08/25/14 00:46		
Tetrachloro-m-xylene	24.39	73.7	70 - 125	2.863	2.868	-0.0050	+/-0.030	
Tetrachloro-m-xylene [2C]	24.39	75.0	70 - 125	3.34	3.343	-0.0030	+/-0.030	
Decachlorobiphenyl	24.39	76.1	60 - 125	7.671	7.676	-0.0050	+/-0.030	
Decachlorobiphenyl [2C]	24.39	79.9	60 - 125	8.44	8.441	-0.0010	+/-0.030	
Matrix Spike Dup (4H08017-MSD1) ug/Kg dry				Lab File ID: 055F5501.D		Analyzed: 08/25/14 01:00		
Tetrachloro-m-xylene	23.74	63.8	70 - 125	2.864	2.868	-0.0040	+/-0.030	*
Tetrachloro-m-xylene [2C]	23.74	65.7	70 - 125	3.34	3.343	-0.0030	+/-0.030	*
Decachlorobiphenyl	23.74	69.9	60 - 125	7.671	7.676	-0.0050	+/-0.030	
Decachlorobiphenyl [2C]	23.74	73.4	60 - 125	8.438	8.441	-0.0030	+/-0.030	
VWW06-SD029-7278 (1408028-04) ug/Kg dry				Lab File ID: 056F5601.D		Analyzed: 08/25/14 01:15		
Tetrachloro-m-xylene	22.22	78.1	70 - 125	2.864	2.868	-0.0040	+/-0.030	
Tetrachloro-m-xylene [2C]	22.22	80.8	70 - 125	3.339	3.343	-0.0040	+/-0.030	
Decachlorobiphenyl	22.22	80.7	60 - 125	7.671	7.676	-0.0050	+/-0.030	
Decachlorobiphenyl [2C]	22.22	84.4	60 - 125	8.439	8.441	-0.0020	+/-0.030	
Calibration Check (4H24005-CCVE) ug/L				Lab File ID: 057F5701.D		Analyzed: 08/25/14 01:29		
Tetrachloro-m-xylene	100.0	102	80 - 120	2.866	2.868	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	102	80 - 120	3.341	3.343	-0.0020	+/-0.030	
Decachlorobiphenyl	100.0	100	80 - 120	7.672	7.676	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	100.0	108	80 - 120	8.439	8.441	-0.0020	+/-0.030	
VWW06-SD030-0006 (1408028-05) ug/Kg dry				Lab File ID: 062F6201.D		Analyzed: 08/25/14 02:42		
Tetrachloro-m-xylene	38.71	80.1	70 - 125	2.865	2.868	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	38.71	80.8	70 - 125	3.34	3.343	-0.0030	+/-0.030	
Decachlorobiphenyl	38.71	76.7	60 - 125	7.672	7.676	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	38.71	82.4	60 - 125	8.44	8.441	-0.0010	+/-0.030	
VWW06-SD030-2430 (1408028-06) ug/Kg dry				Lab File ID: 063F6301.D		Analyzed: 08/25/14 02:57		
Tetrachloro-m-xylene	31.20	83.0	70 - 125	2.865	2.868	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	31.20	84.7	70 - 125	3.34	3.343	-0.0030	+/-0.030	
Decachlorobiphenyl	31.20	79.6	60 - 125	7.672	7.676	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	31.20	85.0	60 - 125	8.44	8.441	-0.0010	+/-0.030	
VWW06-SD030-4854 (1408028-07) ug/Kg dry				Lab File ID: 064F6401.D		Analyzed: 08/25/14 03:11		
Tetrachloro-m-xylene	22.51	67.2	70 - 125	2.865	2.868	-0.0030	+/-0.030	*
Tetrachloro-m-xylene [2C]	22.51	68.8	70 - 125	3.34	3.343	-0.0030	+/-0.030	*
Decachlorobiphenyl	22.51	69.2	60 - 125	7.671	7.676	-0.0050	+/-0.030	
Decachlorobiphenyl [2C]	22.51	74.2	60 - 125	8.44	8.441	-0.0010	+/-0.030	

NQ - QC

075

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory	Empirical Laboratories, LLC	SDG	1408028
Client	CH2M Hill, Inc.	Project	NTR Vieques CTO 113 SWMU 6
Sequence	4H24005	Instrument	GL-ECD3
		Calibration	4232001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
VWW06-SD030P-4854 (1408028-08) ug/Kg dry				Lab File ID: 065F6501.D		Analyzed: 08/25/14 03:26		
Tetrachloro-m-xylene	23.43	71.1	70 - 125	2.865	2.868	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	23.43	72.7	70 - 125	3.34	3.343	-0.0030	+/-0.030	
Decachlorobiphenyl	23.43	73.3	60 - 125	7.671	7.676	-0.0050	+/-0.030	
Decachlorobiphenyl [2C]	23.43	78.1	60 - 125	8.44	8.441	-0.0010	+/-0.030	
VWW06-SD030-7278 (1408028-09) ug/Kg dry				Lab File ID: 066F6601.D		Analyzed: 08/25/14 03:41		
Tetrachloro-m-xylene	23.73	63.3	70 - 125	2.865	2.868	-0.0030	+/-0.030	*
Tetrachloro-m-xylene [2C]	23.73	65.2	70 - 125	3.34	3.343	-0.0030	+/-0.030	*
Decachlorobiphenyl	23.73	68.3	60 - 125	7.67	7.676	-0.0060	+/-0.030	
Decachlorobiphenyl [2C]	23.73	73.1	60 - 125	8.44	8.441	-0.0010	+/-0.030	
VWW06-SD031-0006 (1408028-10) ug/Kg dry				Lab File ID: 067F6701.D		Analyzed: 08/25/14 03:55		
Tetrachloro-m-xylene	35.38	62.1	70 - 125	2.864	2.868	-0.0040	+/-0.030	*
Tetrachloro-m-xylene [2C]	35.38	63.0	70 - 125	3.339	3.343	-0.0040	+/-0.030	*
Decachlorobiphenyl	35.38	59.8	60 - 125	7.671	7.676	-0.0050	+/-0.030	*
Decachlorobiphenyl [2C]	35.38	66.1	60 - 125	8.438	8.441	-0.0030	+/-0.030	
VWW06-SD031-2430 (1408028-11) ug/Kg dry				Lab File ID: 068F6801.D		Analyzed: 08/25/14 04:10		
Tetrachloro-m-xylene	29.27	81.5	70 - 125	2.864	2.868	-0.0040	+/-0.030	
Tetrachloro-m-xylene [2C]	29.27	83.5	70 - 125	3.341	3.343	-0.0020	+/-0.030	
Decachlorobiphenyl	29.27	81.8	60 - 125	7.67	7.676	-0.0060	+/-0.030	
Decachlorobiphenyl [2C]	29.27	87.6	60 - 125	8.439	8.441	-0.0020	+/-0.030	
VWW06-SD031-4854 (1408028-12) ug/Kg dry				Lab File ID: 069F6901.D		Analyzed: 08/25/14 04:24		
Tetrachloro-m-xylene	30.34	76.5	70 - 125	2.865	2.868	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	30.34	77.8	70 - 125	3.341	3.343	-0.0020	+/-0.030	
Decachlorobiphenyl	30.34	80.1	60 - 125	7.67	7.676	-0.0060	+/-0.030	
Decachlorobiphenyl [2C]	30.34	85.4	60 - 125	8.439	8.441	-0.0020	+/-0.030	
VWW06-SD031-7278 (1408028-13) ug/Kg dry				Lab File ID: 070F7001.D		Analyzed: 08/25/14 04:39		
Tetrachloro-m-xylene	23.76	63.8	70 - 125	2.864	2.868	-0.0040	+/-0.030	*
Tetrachloro-m-xylene [2C]	23.76	66.5	70 - 125	3.341	3.343	-0.0020	+/-0.030	*
Decachlorobiphenyl	23.76	68.5	60 - 125	7.669	7.676	-0.0070	+/-0.030	
Decachlorobiphenyl [2C]	23.76	73.2	60 - 125	8.437	8.441	-0.0040	+/-0.030	
Matrix Spike (4H08017-MS2) ug/Kg dry				Lab File ID: 071F7101.D		Analyzed: 08/25/14 04:53		
Tetrachloro-m-xylene	24.00	82.0	70 - 125	2.865	2.868	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	24.00	83.6	70 - 125	3.342	3.343	-0.0010	+/-0.030	
Decachlorobiphenyl	24.00	87.5	60 - 125	7.67	7.676	-0.0060	+/-0.030	
Decachlorobiphenyl [2C]	24.00	92.7	60 - 125	8.439	8.441	-0.0020	+/-0.030	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408028
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H24005	Instrument:	GC-ECD3
		Calibration:	4232001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Matrix Spike Dup (4H08017-MSD2) ug/Kg dry				Lab File ID: 072F7201.D		Analyzed: 08/25/14 05:08		
Tetrachloro-m-xylene	22.77	69.9	70 - 125	2.865	2.868	-0.0030	+/-0.030	*
Tetrachloro-m-xylene [2C]	22.77	71.0	70 - 125	3.34	3.343	-0.0030	+/-0.030	
Decachlorobiphenyl	22.77	78.0	60 - 125	7.672	7.676	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	22.77	81.8	60 - 125	8.44	8.441	-0.0010	+/-0.030	
Calibration Check (4H24005-CCVL) ug/L				Lab File ID: 075F7501.D		Analyzed: 08/25/14 05:52		
Tetrachloro-m-xylene	100.0	107	80 - 120	2.866	2.868	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	106	80 - 120	3.342	3.343	-0.0010	+/-0.030	
Decachlorobiphenyl	100.0	106	80 - 120	7.671	7.676	-0.0050	+/-0.030	
Decachlorobiphenyl [2C]	100.0	111	80 - 120	8.44	8.441	-0.0010	+/-0.030	
VWW06-SD032-0006 (1408028-14) ug/Kg dry				Lab File ID: 076F7601.D		Analyzed: 08/25/14 06:06		
Tetrachloro-m-xylene	33.61	73.4	70 - 125	2.866	2.868	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	33.61	74.7	70 - 125	3.341	3.343	-0.0020	+/-0.030	
Decachlorobiphenyl	33.61	70.9	60 - 125	7.67	7.676	-0.0060	+/-0.030	
Decachlorobiphenyl [2C]	33.61	77.1	60 - 125	8.438	8.441	-0.0030	+/-0.030	
VWW06-SD032-2430 (1408028-15) ug/Kg dry				Lab File ID: 077F7701.D		Analyzed: 08/25/14 06:21		
Tetrachloro-m-xylene	22.66	70.6	70 - 125	2.866	2.868	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	22.66	72.1	70 - 125	3.341	3.343	-0.0020	+/-0.030	
Decachlorobiphenyl	22.66	72.9	60 - 125	7.67	7.676	-0.0060	+/-0.030	
Decachlorobiphenyl [2C]	22.66	78.4	60 - 125	8.438	8.441	-0.0030	+/-0.030	
VWW06-SD032-4854 (1408028-16) ug/Kg dry				Lab File ID: 078F7801.D		Analyzed: 08/25/14 06:35		
Tetrachloro-m-xylene	23.72	70.3	70 - 125	2.866	2.868	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	23.72	72.3	70 - 125	3.341	3.343	-0.0020	+/-0.030	
Decachlorobiphenyl	23.72	73.9	60 - 125	7.669	7.676	-0.0070	+/-0.030	
Decachlorobiphenyl [2C]	23.72	79.4	60 - 125	8.438	8.441	-0.0030	+/-0.030	
VWW06-SD032P-4854 (1408028-17) ug/Kg dry				Lab File ID: 079F7901.D		Analyzed: 08/25/14 06:50		
Tetrachloro-m-xylene	24.02	62.0	70 - 125	2.866	2.868	-0.0020	+/-0.030	*
Tetrachloro-m-xylene [2C]	24.02	64.0	70 - 125	3.341	3.343	-0.0020	+/-0.030	*
Decachlorobiphenyl	24.02	68.6	60 - 125	7.671	7.676	-0.0050	+/-0.030	
Decachlorobiphenyl [2C]	24.02	73.2	60 - 125	8.44	8.441	-0.0010	+/-0.030	
VWW06-SD032-7278 (1408028-18) ug/Kg dry				Lab File ID: 080F8001.D		Analyzed: 08/25/14 07:05		
Tetrachloro-m-xylene	23.53	71.1	70 - 125	2.864	2.868	-0.0040	+/-0.030	
Tetrachloro-m-xylene [2C]	23.53	72.8	70 - 125	3.341	3.343	-0.0020	+/-0.030	
Decachlorobiphenyl	23.53	73.3	60 - 125	7.669	7.676	-0.0070	+/-0.030	
Decachlorobiphenyl [2C]	23.53	78.6	60 - 125	8.438	8.441	-0.0030	+/-0.030	

NQ QC

J/UJ

077

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory	Empirical Laboratories, LLC	SDG	1408028
Client	CH2M Hill, Inc.	Project	NTR Vieques CTO 113 SWMU 6
Sequence	4I25101	Instrument	GL-ECD3
		Calibration	4232001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (4I25101-CCV1) ug/L				Lab File ID: 003F0301.D		Analyzed: 09/04/14 13:38		
Tetrachloro-m-xylene	100.0	92.1	80 - 120	3.153	3.153	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	89.0	80 - 120	3.675	3.675	0.0000	+/-0.030	
Decachlorobiphenyl	100.0	85.2	80 - 120	8.119	8.119	0.0000	+/-0.030	
Decachlorobiphenyl [2C]	100.0	89.3	80 - 120	9.03	9.03	0.0000	+/-0.030	
Blank (4I02013-BLK1) ug/Kg wet				Lab File ID: 008F0801.D		Analyzed: 09/04/14 14:51		
Tetrachloro-m-xylene	16.67	79.8	70 - 125	3.153	3.155	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	16.67	82.3	70 - 125	3.673	3.675	-0.0020	+/-0.030	
Decachlorobiphenyl	16.67	83.9	60 - 125	8.116	8.119	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	16.67	91.9	60 - 125	9.03	9.03	0.0000	+/-0.030	
LCS (4I02013-BS2) ug/Kg wet				Lab File ID: 010F1001.D		Analyzed: 09/04/14 15:20		
Tetrachloro-m-xylene	16.67	81.0	70 - 125	3.151	3.155	-0.0040	+/-0.030	
Tetrachloro-m-xylene [2C]	16.67	83.8	70 - 125	3.673	3.675	-0.0020	+/-0.030	
Decachlorobiphenyl	16.67	81.6	60 - 125	8.114	8.119	-0.0050	+/-0.030	
Decachlorobiphenyl [2C]	16.67	89.7	60 - 125	9.031	9.03	0.0010	+/-0.030	
LCS Dup (4I02013-BSD2) ug/Kg wet				Lab File ID: 011F1101.D		Analyzed: 09/04/14 15:35		
Tetrachloro-m-xylene	16.67	83.8	70 - 125	3.152	3.155	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	16.67	87.4	70 - 125	3.676	3.675	0.0010	+/-0.030	
Decachlorobiphenyl	16.67	83.9	60 - 125	8.116	8.119	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	16.67	92.2	60 - 125	9.032	9.03	0.0020	+/-0.030	
LCS (4I02013-BS3) ug/Kg wet				Lab File ID: 012F1201.D		Analyzed: 09/04/14 15:50		
Tetrachloro-m-xylene	16.67	79.7	70 - 125	3.152	3.155	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	16.67	82.3	70 - 125	3.674	3.675	-0.0010	+/-0.030	
Decachlorobiphenyl	16.67	80.8	60 - 125	8.117	8.119	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	16.67	88.4	60 - 125	9.034	9.03	0.0040	+/-0.030	
VWW06-SD031-0006 (1408028-10RE1) ug/Kg dry				Lab File ID: 013F1301.D		Analyzed: 09/04/14 16:03		
Tetrachloro-m-xylene	35.58	56.1	70 - 125	3.148	3.155	-0.0070	+/-0.030	*
Tetrachloro-m-xylene [2C]	35.58	56.9	70 - 125	3.672	3.675	-0.0030	+/-0.030	*
Decachlorobiphenyl	35.58	37.6	60 - 125	8.112	8.119	-0.0070	+/-0.030	*
Decachlorobiphenyl [2C]	35.58	41.2	60 - 125	9.03	9.03	0.0000	+/-0.030	*
Calibration Check (4I25101-CCV6) ug/L				Lab File ID: 027F2701.D		Analyzed: 09/04/14 19:27		
Tetrachloro-m-xylene	100.0	97.3	80 - 120	3.151	3.155	-0.0040	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	97.2	80 - 120	3.671	3.675	-0.0040	+/-0.030	
Decachlorobiphenyl	100.0	90.8	80 - 120	8.114	8.119	-0.0050	+/-0.030	
Decachlorobiphenyl [2C]	100.0	97.0	80 - 120	9.033	9.03	0.0030	+/-0.030	

exclude
DF
degraded

078

FORM X
IDENTIFICATION SUMMARY
FOR SINGLE COMPONENT ANALYTES

VWW06-S0031-0006

Lab Name: Empirical Laboratories, LLC

Lab Sample ID: 1408028-10RE1 Date(s) Analyzed: 09/04/2014 09/04/2014

Instrument ID (1): GL-ECD3 Instrument ID (2): GL-ECD3

GC Column (1): ID: (mm) GC Column (2): ID: (mm)

ANALYTE	COL	RT	RT WINDOW		CONCENTRATION	%D
			FROM	TO		
Aroclor-1254	1	5.43	4.84	4.90	21.2	
	2	6.73	6.14	6.20	32.5	42

No Qual - Sample excluded

This SDG contains 18 solid matrix samples and 1 QC blank sample analyzed for select metals using SW-846 methods 6010C. Region II validation guidelines were applied (updated 12/20/12) and these worksheets are submitted along with marked up pages from the data package and annotated form 1s and EDD files.

HOLDING TIMES

Sampling Date: 8/5/14
Received Date: 8/6/14
Prep. Dates: 8/18, 8/21, 8/22, & 8/25
Analysis Dates: 8/19, 8/27, & 8/29

All preparation & analysis holding time requirements were met. Cooler temps were acceptable and receipt paperwork was in order. Three samples exhibited %moisture values <50%. All results in samples VW006-SD030-0006 (41.32%), VW006-SD031-0006 (45.45%) & VW006-SD032-0006 (47.53%) are flagged as estimated J/UJ.

CALIBRATIONS

All initial calibration criteria were met for the methods noted above. All ICV, CCV and low calibration standard criteria were met or associated samples were reanalyzed against acceptable QC standards. PQL standard criteria were met. ICSA/ICSAB results were within method criteria for all analytes. Raw data was verified.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- See blank type specific validation guidelines noted below (taken from the Region II SOP for CLP metals and adapted to this project).
- Qualification/Action codes:

Note: non-detect results are reported to the LOD so the LOD is the RL for this project.

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the reporting limit, when the ICB/CCB/PB result is less than the RL.
R -	Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
J/UJ -	Sample result is less than 10X RL when blank result is below the negative RL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.
Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL when the field blank result is greater than the RL - result is reported as non-detect at the reporting limit.
R -	Sample result is greater than the RL and less than the field blank value when the field blank result is greater than the RL.
J -	Sample result is greater than the field blank value but less than 10X the field blank value when field blank result is greater than the RL.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	Action Level	Q Flag
no contamination was noted in the associated blanks				

See validation report for specific samples and qualifications. Only those analytes requiring action are listed here. Negative contamination in a prep blank or

CCB, if less than the analyte CRDL, is qualified based on professional judgment. Field QC blank associations are determined using tracking provided by the client. Flags are applied to samples based on these associations. **The concentration noted for the CCBs is the highest concentration in all the associated CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for CCB contamination.**

MATRIX SPIKE/DUPLICATE SUMMARY

Qualifications were made based on the 12/12 revision of the Region II guidance SOPs which flags only the native sample for spike and spike dup recovery and RPD issues. The submitted PDS spikes were also considered in the evaluation of the spike data.

The MS/MSD pairs of samples VWW06-SD029-4854 & VWW06-SD031-7278 exhibited acceptable recoveries as did the PDS samples. All associated LCS recoveries were acceptable also. No qualifications were required.

SERIAL DILUTIONS

The laboratory submitted acceptable serial dilution analyses. No qualifications were required.

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments. Dilutions were performed. The raw data and calculations were verified. Field duplicates were assessed – see the following page for results and qualifications if needed.

Reviewer _____ **Date:** 10/7/14

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD030-4854
Duplicate Sample ID: VWW06-SD030P-4854

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	1.04	1.26	19
zinc	8.3	9.63	15

COMMENTS: No qualifications were required
*30% RPD limit for all analytes >5X LOD - results in both samples flagged J

Sample ID: VWW06-SD032-4854
Duplicate Sample ID: VWW06-SD032P-4854

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	1.19	1.18	1
zinc	10.9	9.99	9

COMMENTS: No qualifications were required
*30% RPD limit for all analytes >5X LOD - results in both samples flagged J

CH2M HILL VIEQUES CTO-113

METALS CALCULATIONS

SDG 1408028

ICP - AES	
SAMPLE ID	VWW06-SD029-0006
ANALYTE	LEAD
Lab Value CONCENTRATION (ug/Kg)	161
AMOUNT FROM RAW DATA (ug/L)	234.59
SAMPLE SIZE (g)	0.96
FINAL VOLUME (L)	0.2
DILUTION FACTOR	2
DRYNESS FACTOR	0.6079
CONVERSION FACTOR (g TO Kg)	1
CALCULATED CONCENTRATION (ug/Kg)	161

CH2MHILL VIEQUES SWMU6 CTO-113

SDG 1408028

Reporting Limit Calcs

ICP - AES	
SAMPLE ID	VWW06-SD029-0006
ANALYTE	lead
Form 1 LOD or LOQ Value (mg/Kg)	2.06
Analyte LOD or LOQ	0.6
SAMPLE SIZE (g)	0.96
DILUTION FACTOR	2
DRYNESS FACTOR	0.6079
Corrected LOD or LOQ (mg/Kg)	2.056

DataQual
Environmental Services, LLC

CH2M HILL-VBO
5701 Cleveland Street
Suite 200
Virginia Beach, VA 23462

October 28, 2014
SDG# 1408041; Empirical Laboratories, LLC
Vieques CTO-113, SWMU6 – Naval Training Range

Dear Ms. Dean,

The following Data Validation report is provided as requested for the parameters noted in the table below for SDG # 1408041. The data validation was performed in accordance with the SW-846 methods utilized by the laboratory, professional judgment, and the guidance offered in the region II SOPs HW-2a Revision 15, December 2012, for ICP-AES data validation and HW-37 Revision 3, May 2013, for PCB data validation. The DoD Quality Systems Manual for Environmental Laboratories Version 4.2 and the project specific SAP were also consulted. Worksheets tabulating the validation process including calculation verifications are included in the support documentation section of this report. All areas of concern are discussed in the body of the report and a summary of data qualifications are provided.

Sample ID	Lab ID	Matrix	PCB	Pb, Zn
VWW06-SD033-0006	1408041-01	soil	X	X
VWW06-SD033-2430	1408041-02	soil	X	X
VWW06-SD033-4854	1408041-03	soil	X	X
VWW06-SD033-7278	1408041-04	soil	X	X
VWW06-SD028-0006	1408041-05	soil	X	X
VWW06-SD028-2430	1408041-06	soil	X	X
VWW06-SD028P-2430	1408041-07	soil	X	X
VWW06-SD028-4854	1408041-08	soil	X	X
VWW06-SD028-7278	1408041-09	soil	X	X
VWW06-SD027-0006	1408041-10	soil	X	X
VWW06-SD027-2430	1408041-11	soil	X	X
VWW06-SD027-2430MS	1408041-11MS	soil	X	X
VWW06-SD027-2430MSD	1408041-11MSD	soil	X	X
VWW06-SD027-4854	1408041-12	soil	X	X
VWW06-SD027-7278	1408041-13	soil	X	X
VWW06-SD026-0006	1408041-14	soil	X	X
VWW06-SD026-2430	1408041-15	soil	X	X
VWW06-SD026P-2430	1408041-16	soil	X	X
VWW06-SD026-4854	1408041-17	soil	X	X
VWW06-SD026-7278	1408041-18	soil	X	X
VWW06-SD025-0006	1408041-19	soil	X	X
VWW06-SD025-0006MS	1408041-19MS	soil	X	X
VWW06-SD025-0006MSD	1408041-19MSD	soil	X	X
VWW06-SD025-2430	1408041-20	soil	X	X
VWW06-SD025-4854	1408041-21	soil	X	X
VWW06-SD025-7278	1408041-22	soil	X	X

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Sample ID	Lab ID	Matrix	PCB	Pb, Zn
VWW06-SD024-0006	1408041-23	soil	X	X
VWW06-SD024P-0006	1408041-24	soil	X	X
VWW06-SD024-2430	1408041-25	soil	X	X
VWW06-SD024-4854	1408041-26	soil	X	X
VWW06-SD024-7278	1408041-27	soil	X	X
VWW06-EB01-080614	1408041-28	water	X	X

The following quality control samples were provided with this SDG: sample VWW06-SD028P-2430-field duplicate of sample VWW06-SD028-2430; sample VWW06-SD026P-2430-field duplicate of sample VWW06-SD026-2430; sample VWW06-SD024P-0006-field duplicate of sample VWW06-SD024-0006; and rinse blank sample VWW06-EB01-080614.

The samples were evaluated based on the following criteria:

- Data Completeness *
- Sample Condition
- Technical Holding Times
- Initial/Continuing Calibrations *
- ICSA/ICSAB Standards *
- Low Level Standards *
- Blanks *
- Surrogate Recoveries
- Laboratory Control Samples *
- Matrix Spike Recoveries *
- Matrix Duplicate RPDs *
- Serial Dilutions *
- Field Duplicates
- Identification/Quantitation *
- Reporting Limits *

* - indicates that qualifications were not required based on this criteria

Overall Evaluation of Data/Potential Usability Issues

A summary of qualifications applied to the sample results are noted below for the fractions validated. Specific details regarding qualification of the data are addressed in the Specific Evaluation section of this narrative. If an issue is not addressed there were no actions required based on unmet quality criteria. When more than one qualifier is associated with a compound/analyte the validator has chosen the qualifier that best indicates possible bias in the results and flagged the data accordingly. However, information regarding all quality control issues is provided in the body of the report and on the qualification summary page. *If an issue is not addressed in this narrative there were no actions required based on unmet quality control criteria.*

PCBs

No critical findings resulting in data rejections were noted. Some major findings resulting in qualification of data as estimated were noted. The majority of the data is reported without qualification.

Several samples were re-extracted outside the recommending holding time. These samples were excluded in favor of the results reported from the original analyses of the samples.

Qualifications were required based on non-compliant surrogate recoveries.

Select Metals Pb & Zn

One sample exhibited high (>50%) moisture content (based on Region II requirements). All reported results in these samples were qualified as estimated J/UJ.

One of the field duplicate pairs exhibited RPDs greater than the 30% RPD criteria from the project specific SAP and qualifications were required.

Specific Evaluation of Data

Data Completeness

The SDG was received complete and intact. Updated MS/MSD results forms that included the client sample ID were requested and received from the laboratory.

Technical Holding Times

According to chain of custody records, sampling was performed on 8/5/14, & 8/6/14 and samples were received at the laboratory 8/7/14. All sample preparation and analysis was performed within Region II and/or method holding time requirements with the following exception.

PCBs

Several samples were re-extracted due to non-compliant surrogate recoveries. Samples VWW06-SD027-0006 RE1, VWW06-SD025-0006 RE1, VWW06-SD024-0006 RE1, and VWW06-SD024P-0006 RE1, which were re-extracted 10 days outside the holding time, are excluded in favor of the results reported from the analyses reported from the initial extractions.

Sample Condition

Select Metals, Pb & Zn

One sample exhibited high moisture content (%solids < 50%) as noted in the following table. All reported results were qualified as estimated J/UJ based on the Region II guidance.

Sample ID	%Solids	Q Flag	Q Code
VWW06-SD027-2430	37.5	J/UJ	OT

Surrogate Recoveries

PCBs

Several samples exhibited non-compliant recoveries as noted in the following table. Results required qualifications as noted. QC limits from the project specific SAP were used to assess the recoveries.

Sample ID	Surrogate	%R	QC Limits	Q Flag	Q Code
VWW06-SD028-4854	TCMX	61.3/65.9	70-125	J-/UJ	SSL
VWW06-SD026-4854	TCMX DCB	67.7 59.5	70-125 60-125		
VWW06-SD024-7278	DCB	40.3/41.6	60-125		
VWW06-SD033-0006	TCMX	64.9/67.1	60-125		
VWW06-SD027-0006	TCMX DCB	53.1/54.6 46.0/52.5	70-125 60-125		
VWW06-SD025-0006	TCMX DCB	58.2/60.1 42.3/47.0	70-125 60-125		
VWW06-SD024-0006	TCMX DCB	59.7/64.0 53.3/60.2	70-125 60-125		
VWW06-SD024P-0006	TCMX DCB	65.3/68.3 53.6/59.4	70-125 60-125		
VWW06-SD024-2430	DCB	51.6/55.9	60-125		

Field Duplicates

Select Metals, Pb & Zn

The field duplicate pair of samples VWW06-SD026-2430 & VWW06-SD026P-2430 exhibited a high RPD (> 30%) for lead (42%) and zinc (74%). The reported results are qualified as estimated J with a qualifier code of FD.

A summary of qualifications required is provided on the following page. Please do not hesitate to contact DataQual ES with any questions regarding this validation report.

Sincerely,

Jacqueline Cleveland

Jacqueline Cleveland
Vice President

Summary of Data Qualifications

PCBs

Sample ID	Compounds	Results	Q Flag	Q Code
VWW06-SD027-0006 RE1, VWW06-SD025-0006 RE1, VWW06-SD024-0006 RE1, VWW06-SD024P-0006 RE1	all compounds	+/-	exclude	RE
VWW06-SD028-4854, VWW06-SD026-4854, VWW06-SD024-7278, VWW06-SD033-0006, VWW06-SD027-0006, VWW06-SD025-0006, VWW06-SD024-0006, VWW06-SD024P-0006, VWW06-SD024-2430	all compounds	+/-	J/UJ	SSL

Select Metals – Pb & Zn

Sample ID	Analyte	Results	Q flag	Q Code
VWW06-SD027-2430	all analytes	+/-	J/UJ	OT
VWW06-SD026-2430, VWW06-SD026P-2430	lead zinc	+	J	FD

Glossary of Qualification Flags and Abbreviations

Qualification Flags (Q-Flags)

U	not detected above the reported sample quantitation limit
J	estimated value
J+	estimated biased high
J-	estimated biased low
UJ	reported quantitation limit is qualified as estimated
N	analyte has been tentatively identified
JN	analyte has been tentatively identified, estimated value
R	result is rejected; the presence or absence of the analyte cannot be verified

Method/Preparation/Field QC Blank Qualification Flags (Q-Flags)

Organic Methods

NA	The sample result for the blank contaminant is greater than the LOD (2X sample LOD for common laboratory contaminants) when the blank value is less than the LOD. The sample result for the blank contaminant is not qualified with any blank qualifiers.
LOD	The sample result for the blank contaminant is less than the LOD (2X sample LOD for common laboratory contaminants) but greater than the MDL when the blank value is less than the LOD. The sample result for the blank contaminant is changed to the LOD and qualified as non-detect U.

Inorganic Methods

ICB/CCB/PB Action:

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD, when the ICB/CCB/PB result is less or greater than the LOD.
R -	Sample result is greater than the LOD and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the LOD.
J+ -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the LOD.
J/UJ -	Sample result is less than 10X LOD when blank result is below the negative LOD.

Glossary of Qualification Flags and Abbreviations, continued

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.

Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the LOD and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the LOD, result is reported as non-detect at the LOD when the FB result is less or greater than the LOD.
R –	Sample result is greater than the LOD and less than the FB value when the FB value is greater than the LOD.
J+ -	Sample result is greater than the FB value but less than 10X the FB value when FB value is greater than the LOD.

General Abbreviations

MDL	method detection limit
IDL	instrument detection limit
LOD/RL	Level of Detection//Reporting Limit
LOQ	Level of Quantitation
+	positive result
-	non-detect result

ANALYSIS DATA SHEET

VWW06-SD033-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-01	File ID:	056R5601.D
Sampled:	08/05/14 09:05	Prepared:	08/11/14 11:54	Analyzed:	08/27/14 01:11
Solids:	51.29	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08021	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.9	21.2	63.7	UJ U SL
12674-11-2	Aroclor-1016		7.97	15.9	31.9	U
11104-28-2	Aroclor-1221		7.97	15.9	31.9	U
11141-16-5	Aroclor-1232		7.97	15.9	31.9	U
53469-21-9	Aroclor-1242		7.97	15.9	31.9	U
12672-29-6	Aroclor-1248		7.97	15.9	31.9	U
11097-69-1	Aroclor-1254		7.97	15.9	31.9	U
11096-82-5	Aroclor-1260		7.97	15.9	31.9	U
37324-23-5	Aroclor-1262		7.97	15.9	31.9	U
11100-14-4	Aroclor-1268		7.97	15.9	31.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.86	20.68	64.9	70 - 125	
Tetrachloro-m-xylene [2C]	31.86	21.38	67.1	70 - 125	
Decachlorobiphenyl	31.86	20.77	65.2	60 - 125	
Decachlorobiphenyl [2C]	31.86	22.69	71.2	60 - 125	

JAC 12/3/14

ANALYSIS DATA SHEET

VWW06-SD033-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-02RE1	File ID:	012F1201.D
Sampled:	08/05/14 09:10	Prepared:	08/19/14 14:45	Analyzed:	08/26/14 14:28
Solids:	60.42	Preparation:	EXT_3546	Dilution:	1
Batch:	4H18026	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.6	18.2	54.5	U
12674-11-2	Aroclor-1016		6.82	13.6	27.3	U
11104-28-2	Aroclor-1221		6.82	13.6	27.3	U
11141-16-5	Aroclor-1232		6.82	13.6	27.3	U
53469-21-9	Aroclor-1242		6.82	13.6	27.3	U
12672-29-6	Aroclor-1248		6.82	13.6	27.3	U
11097-69-1	Aroclor-1254		6.82	13.6	27.3	U
11096-82-5	Aroclor-1260		6.82	13.6	27.3	U
37324-23-5	Aroclor-1262		6.82	13.6	27.3	U
11100-14-4	Aroclor-1268		6.82	13.6	27.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.26	22.69	83.2	70 - 125	
Tetrachloro-m-xylene [2C]	27.26	22.22	81.5	70 - 125	
Decachlorobiphenyl	27.26	21.85	80.1	60 - 125	
Decachlorobiphenyl [2C]	27.26	22.95	84.2	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD033-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-03	File ID:	052F5201.D
Sampled:	08/05/14 09:15	Prepared:	08/11/14 11:54	Analyzed:	08/13/14 01:06
Solids:	65.90	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08021	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry	DL	LOD	LOQ	Q
NA	Total PCBs		12.4	16.5	49.6	U
12674-11-2	Aroclor-1016		6.22	12.4	24.9	U
11104-28-2	Aroclor-1221		6.22	12.4	24.9	U
11141-16-5	Aroclor-1232		6.22	12.4	24.9	U
53469-21-9	Aroclor-1242		6.22	12.4	24.9	U
12672-29-6	Aroclor-1248		6.22	12.4	24.9	U
11097-69-1	Aroclor-1254		6.22	12.4	24.9	U
11096-82-5	Aroclor-1260		6.22	12.4	24.9	U
37324-23-5	Aroclor-1262		6.22	12.4	24.9	U
11100-14-4	Aroclor-1268		6.22	12.4	24.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	24.84	17.17	69.1	70 - 125	*
Tetrachloro-m-xylene [2C]	24.84	18.56	74.7	70 - 125	
Decachlorobiphenyl	24.84	17.87	71.9	60 - 125	
Decachlorobiphenyl [2C]	24.84	18.29	73.6	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD033-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU6	
Matrix:	Solid	Laboratory ID:	1408041-04	File ID:	053F5301.D
Sampled:	08/05/14 09:20	Prepared:	08/11/14 11:54	Analyzed:	08/13/14 01:20
Solids:	72.57	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08021	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.4	15.2	45.5	U
12674-11-2	Aroclor-1016		5.69	11.4	22.8	U
11104-28-2	Aroclor-1221		5.69	11.4	22.8	U
11141-16-5	Aroclor-1232		5.69	11.4	22.8	U
53469-21-9	Aroclor-1242		5.69	11.4	22.8	U
12672-29-6	Aroclor-1248		5.69	11.4	22.8	U
11097-69-1	Aroclor-1254		5.69	11.4	22.8	U
11096-82-5	Aroclor-1260		5.69	11.4	22.8	U
37324-23-5	Aroclor-1262		5.69	11.4	22.8	U
11100-14-4	Aroclor-1268		5.69	11.4	22.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	22.75	17.40	76.5	70 - 125	
Tetrachloro-m-xylene [2C]	22.75	18.69	82.2	70 - 125	
Decachlorobiphenyl	22.75	18.19	80.0	60 - 125	
Decachlorobiphenyl [2C]	22.75	18.66	82.0	60 - 125	

JAC 10/3/14

ANALYSIS DATA SHEET

VWW06-SD028-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-05	File ID:	057R5701.D
Sampled:	08/05/14 09:40	Prepared:	08/11/14 11:54	Analyzed:	08/27/14 01:26
Solids:	59.96	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08021	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.6	18.1	54.3	U
12674-11-2	Aroclor-1016		6.80	13.6	27.2	U
11104-28-2	Aroclor-1221		6.80	13.6	27.2	U
11141-16-5	Aroclor-1232		6.80	13.6	27.2	U
53469-21-9	Aroclor-1242		6.80	13.6	27.2	U
12672-29-6	Aroclor-1248		6.80	13.6	27.2	U
11097-69-1	Aroclor-1254		6.80	13.6	27.2	U
11096-82-5	Aroclor-1260		6.80	13.6	27.2	U
37324-23-5	Aroclor-1262		6.80	13.6	27.2	U
11100-14-4	Aroclor-1268		6.80	13.6	27.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.16	18.69	68.8	70 - 125	*
Tetrachloro-m-xylene [2C]	27.16	19.30	71.0	70 - 125	
Decachlorobiphenyl	27.16	18.84	69.4	60 - 125	
Decachlorobiphenyl [2C]	27.16	20.76	76.4	60 - 125	

CAC 12/23/14

ANALYSIS DATA SHEET

VWW06-SD028-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU6	
Matrix:	Solid	Laboratory ID:	1408041-06RE1	File ID:	013F1301.D
Sampled:	08/05/14 09:45	Prepared:	08/19/14 14:45	Analyzed:	08/26/14 14:43
Solids:	51.16	Preparation:	EXT_3546	Dilution:	1
Batch:	4H18026	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry	DL	LOD	LOQ	Q
NA	Total PCBs		16.2	21.5	64.6	U
12674-11-2	Aroclor-1016		8.09	16.2	32.4	U
11104-28-2	Aroclor-1221		8.09	16.2	32.4	U
11141-16-5	Aroclor-1232		8.09	16.2	32.4	U
53469-21-9	Aroclor-1242		8.09	16.2	32.4	U
12672-29-6	Aroclor-1248		8.09	16.2	32.4	U
11097-69-1	Aroclor-1254		8.09	16.2	32.4	U
11096-82-5	Aroclor-1260		8.09	16.2	32.4	U
37324-23-5	Aroclor-1262		8.09	16.2	32.4	U
11100-14-4	Aroclor-1268		8.09	16.2	32.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	32.32	25.06	77.5	70 - 125	
Tetrachloro-m-xylene [2C]	32.32	25.36	78.5	70 - 125	
Decachlorobiphenyl	32.32	25.31	78.3	60 - 125	
Decachlorobiphenyl [2C]	32.32	26.72	82.7	60 - 125	

JBC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD028P-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-07RE1	File ID:	014F1401.D
Sampled:	08/05/14 09:50	Prepared:	08/19/14 14:45	Analyzed:	08/26/14 14:57
Solids:	52.21	Preparation:	EXT_3546	Dilution:	1
Batch:	4H18026	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.8	21.1	63.3	U
12674-11-2	Aroclor-1016		7.93	15.8	31.8	U
11104-28-2	Aroclor-1221		7.93	15.8	31.8	U
11141-16-5	Aroclor-1232		7.93	15.8	31.8	U
53469-21-9	Aroclor-1242		7.93	15.8	31.8	U
12672-29-6	Aroclor-1248		7.93	15.8	31.8	U
11097-69-1	Aroclor-1254		7.93	15.8	31.8	U
11096-82-5	Aroclor-1260		7.93	15.8	31.8	U
37324-23-5	Aroclor-1262		7.93	15.8	31.8	U
11100-14-4	Aroclor-1268		7.93	15.8	31.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.69	26.32	83.0	70 - 125	
Tetrachloro-m-xylene [2C]	31.69	26.80	84.6	70 - 125	
Decachlorobiphenyl	31.69	26.85	84.7	60 - 125	
Decachlorobiphenyl [2C]	31.69	28.31	89.3	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD028-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-08	File ID:	057F5701.D
Sampled:	08/05/14 09:55	Prepared:	08/11/14 11:54	Analyzed:	08/13/14 02:15
Solids:	67.88	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08021	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.9	15.9	47.6	ICT U SSL
12674-11-2	Aroclor-1016		5.96	11.9	23.9	U
11104-28-2	Aroclor-1221		5.96	11.9	23.9	U
11141-16-5	Aroclor-1232		5.96	11.9	23.9	U
53469-21-9	Aroclor-1242		5.96	11.9	23.9	U
12672-29-6	Aroclor-1248		5.96	11.9	23.9	U
11097-69-1	Aroclor-1254		5.96	11.9	23.9	U
11096-82-5	Aroclor-1260		5.96	11.9	23.9	U
37324-23-5	Aroclor-1262		5.96	11.9	23.9	U
11100-14-4	Aroclor-1268		5.96	11.9	23.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	23.84	14.61	61.3	70 - 125	*
Tetrachloro-m-xylene [2C]	23.84	15.70	65.9	70 - 125	*
Decachlorobiphenyl	23.84	14.48	60.7	60 - 125	
Decachlorobiphenyl [2C]	23.84	14.77	62.0	60 - 125	

SJC 10/3/14

ANALYSIS DATA SHEET

VWW06-SD028-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-09	File ID:	058F5801.D
Sampled:	08/05/14 10:00	Prepared:	08/11/14 11:54	Analyzed:	08/13/14 02:28
Solids:	71.33	Preparation:	EXT 3546	Dilution:	1
Batch:	4H08021	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry	DL	LOD	LOQ	Q
NA	Total PCBs		11.1	14.8	44.3	U
12674-11-2	Aroclor-1016		5.55	11.1	22.2	U
11104-28-2	Aroclor-1221		5.55	11.1	22.2	U
11141-16-5	Aroclor-1232		5.55	11.1	22.2	U
53469-21-9	Aroclor-1242		5.55	11.1	22.2	U
12672-29-6	Aroclor-1248		5.55	11.1	22.2	U
11097-69-1	Aroclor-1254		5.55	11.1	22.2	U
11096-82-5	Aroclor-1260		5.55	11.1	22.2	U
37324-23-5	Aroclor-1262		5.55	11.1	22.2	U
11100-14-4	Aroclor-1268		5.55	11.1	22.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	22.17	16.12	72.7	70 - 125	
Tetrachloro-m-xylene 12Cl	22.17	17.46	78.7	70 - 125	
Decachlorobiphenyl	22.17	17.75	80.1	60 - 125	
Decachlorobiphenyl 12Cl	22.17	18.16	81.9	60 - 125	

SAC 10/31/14

ANALYSIS DATA SHEET

VWW06-SD027-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-10	File ID:	058R5801.D
Sampled:	08/05/14 10:25	Prepared:	08/11/14 11:54	Analyzed:	08/27/14 01:40
Solids:	64.65	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08021	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		12.6	16.9	50.6	U5 U SSL
12674-11-2	Aroclor-1016		6.33	12.6	25.4	U
11104-28-2	Aroclor-1221		6.33	12.6	25.4	U
11141-16-5	Aroclor-1232		6.33	12.6	25.4	U
53469-21-9	Aroclor-1242		6.33	12.6	25.4	U
12672-29-6	Aroclor-1248		6.33	12.6	25.4	U
11097-69-1	Aroclor-1254		88.1	88.1	88.1	U
11096-82-5	Aroclor-1260		6.33	12.6	25.4	U
37324-23-5	Aroclor-1262		6.33	12.6	25.4	U
11100-14-4	Aroclor-1268		6.33	12.6	25.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC. (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	25.31	13.45	53.1	70 - 125	✓
Tetrachloro-m-xylene [2C]	25.31	13.82	54.6	70 - 125	✓
Decachlorobiphenyl	25.31	11.63	46.0	60 - 125	✓
Decachlorobiphenyl [2C]	25.31	13.30	52.5	60 - 125	✓

ANALYSIS DATA SHEET

VWW06-SD027-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-10RE1	File ID:	077F7701.D
Sampled:	08/05/14 10:25	Prepared:	08/29/14 12:17	Analyzed:	09/05/14 14:29
Solids:	64.65	Preparation:	EXT_3546	Dilution:	1
Batch:	4H29007	Sequence: 4I25101	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		12.6	16.8	50.5	H2U
12674-11-2	Aroclor-1016		6.32	12.6	25.3	H2U
11104-28-2	Aroclor-1221		6.32	12.6	25.3	H2U
11141-16-5	Aroclor-1232		6.32	12.6	25.3	H2U
53469-21-9	Aroclor-1242		6.32	12.6	25.3	H2U
12672-29-6	Aroclor-1248		6.32	12.6	25.3	H2U
11097-69-1	Aroclor-1254		6.32	12.6	25.3	H2U
11096-82-5	Aroclor-1260		6.32	12.6	25.3	H2U
37324-23-5	Aroclor-1262		6.32	12.6	25.3	H2U
11100-14-4	Aroclor-1268		6.32	12.6	25.3	H2U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	25.27	22.79	90.2	70 - 125	H2
Tetrachloro-m-xylene [2C]	25.27	23.67	93.7	70 - 125	H2
Decachlorobiphenyl	25.27	20.71	81.9	60 - 125	H2
Decachlorobiphenyl [2C]	25.27	24.24	95.9	60 - 125	H2

10/13/14

ANALYSIS DATA SHEET

VWW06-SD027-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-11RE1	File ID:	015F1501.D
Sampled:	08/05/14 10:30	Prepared:	08/19/14 14:45	Analyzed:	08/26/14 15:12
Solids:	37.51	Preparation:	EXT 3546	Dilution:	1
Batch:	4H18026	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		21.5	28.7	86.1	U
12674-11-2	Aroclor-1016		10.8	21.5	43.2	U
11104-28-2	Aroclor-1221		10.8	21.5	43.2	U
11141-16-5	Aroclor-1232		10.8	21.5	43.2	U
53469-21-9	Aroclor-1242		10.8	21.5	43.2	U
12672-29-6	Aroclor-1248		10.8	21.5	43.2	U
11097-69-1	Aroclor-1254		10.8	21.5	43.2	U
11096-82-5	Aroclor-1260		10.8	21.5	43.2	U
37324-23-5	Aroclor-1262		10.8	21.5	43.2	U
11100-14-4	Aroclor-1268		10.8	21.5	43.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	43.11	36.90	85.6	70 - 125	
Tetrachloro-m-xylene [2C]	43.11	37.21	86.3	70 - 125	
Decachlorobiphenyl	43.11	37.57	87.2	60 - 125	
Decachlorobiphenyl [2C]	43.11	39.70	92.1	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD027-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-12	File ID:	063F6301.D
Sampled:	08/05/14 10:35	Prepared:	08/11/14 11:54	Analyzed:	08/13/14 03:37
Solids:	62.46	Preparation:	EXT_3546	Dilution:	1

Batch: 4H08021 Sequence: 4H22602 Calibration: 4209006 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.2	17.6	52.8	U
12674-11-2	Aroclor-1016		6.61	13.2	26.5	U
11104-28-2	Aroclor-1221		6.61	13.2	26.5	U
11141-16-5	Aroclor-1232		6.61	13.2	26.5	U
53469-21-9	Aroclor-1242		6.61	13.2	26.5	U
12672-29-6	Aroclor-1248		6.61	13.2	26.5	U
11097-69-1	Aroclor-1254		6.61	13.2	26.5	U
11096-82-5	Aroclor-1260		6.61	13.2	26.5	U
37324-23-5	Aroclor-1262		6.61	13.2	26.5	U
11100-14-4	Aroclor-1268		6.61	13.2	26.5	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.43	17.93	67.8	70 - 125	*
Tetrachloro-m-xylene [2C]	26.43	19.19	72.6	70 - 125	
Decachlorobiphenyl	26.43	19.49	73.7	60 - 125	
Decachlorobiphenyl [2C]	26.43	19.87	75.2	60 - 125	

gjc 10/13/14

ANALYSIS DATA SHEET

VWW06-SD027-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-13	File ID:	067F6701.D
Sampled:	08/05/14 10:40	Prepared:	08/11/14 11:54	Analyzed:	08/13/14 04:32
Solids:	68.73	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08021	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.7	15.6	46.7	U
12674-11-2	Aroclor-1016		5.85	11.7	23.4	U
11104-28-2	Aroclor-1221		5.85	11.7	23.4	U
11141-16-5	Aroclor-1232		5.85	11.7	23.4	U
53469-21-9	Aroclor-1242		5.85	11.7	23.4	U
12672-29-6	Aroclor-1248		5.85	11.7	23.4	U
11097-69-1	Aroclor-1254		5.85	11.7	23.4	U
11096-82-5	Aroclor-1260		5.85	11.7	23.4	U
37324-23-5	Aroclor-1262		5.85	11.7	23.4	U
11100-14-4	Aroclor-1268		5.85	11.7	23.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	23.38	17.53	75.0	70 - 125	
Tetrachloro-m-xylene [2C]	23.38	18.97	81.1	70 - 125	
Decachlorobiphenyl	23.38	14.83	63.4	60 - 125	
Decachlorobiphenyl [2C]	23.38	15.32	65.5	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD026-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-14	File ID:	059R5901.D
Sampled:	08/05/14 12:05	Prepared:	08/11/14 11:54	Analyzed:	08/27/14 01:55
Solids:	73.65	Preparation:	EXT 3546	Dilution:	1
Batch:	4H08021	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.1	14.8	44.4	U
12674-11-2	Aroclor-1016		5.55	11.1	22.2	U
11104-28-2	Aroclor-1221		5.55	11.1	22.2	U
11141-16-5	Aroclor-1232		5.55	11.1	22.2	U
53469-21-9	Aroclor-1242		5.55	11.1	22.2	U
12672-29-6	Aroclor-1248		5.55	11.1	22.2	U
11097-69-1	Aroclor-1254		21.3	21.3	22.2	C9U
11096-82-5	Aroclor-1260		5.55	11.1	22.2	U
37324-23-5	Aroclor-1262		5.55	11.1	22.2	U
11100-14-4	Aroclor-1268		5.55	11.1	22.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	22.20	16.28	73.4	70 - 125	
Tetrachloro-m-xylene [2C]	22.20	16.60	74.8	70 - 125	
Decachlorobiphenyl	22.20	16.82	75.8	60 - 125	
Decachlorobiphenyl [2C]	22.20	18.38	82.8	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD026-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-15RE1	File ID:	018F1S01.D
Sampled:	08/05/14 12:10	Prepared:	08/19/14 14:45	Analyzed:	08/26/14 15:56
Solids:	50.12	Preparation:	EXT_3546	Dilution:	1
Batch:	4H18026	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		16.3	21.7	65.1	U
12674-11-2	Aroclor-1016		8.16	16.3	32.7	U
11104-28-2	Aroclor-1221		8.16	16.3	32.7	U
11141-16-5	Aroclor-1232		8.16	16.3	32.7	U
53469-21-9	Aroclor-1242		8.16	16.3	32.7	U
12672-29-6	Aroclor-1248		8.16	16.3	32.7	U
11097-69-1	Aroclor-1254		8.16	16.3	32.7	U
11096-82-5	Aroclor-1260		8.16	16.3	32.7	U
37324-23-5	Aroclor-1262		8.16	16.3	32.7	U
11100-14-4	Aroclor-1268		8.16	16.3	32.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	32.60	28.14	86.3	70 - 125	
Tetrachloro-m-xylene [2C]	32.60	29.00	89.0	70 - 125	
Decachlorobiphenyl	32.60	27.42	84.1	60 - 125	
Decachlorobiphenyl [2C]	32.60	29.04	89.1	60 - 125	

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ANALYSIS DATA SHEET

VWW06-SD026P-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-16RE1	File ID:	019F1901.D
Sampled:	08/05/14 12:15	Prepared:	08/19/14 14:45	Analyzed:	08/26/14 16:11
Solids:	50.79	Preparation:	EXT_3546	Dilution:	1
Batch:	4H18026	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		15.9	21.1	63.4	U
12674-11-2	Aroclor-1016		7.95	15.9	31.8	U
11104-28-2	Aroclor-1221		7.95	15.9	31.8	U
11141-16-5	Aroclor-1232		7.95	15.9	31.8	U
53469-21-9	Aroclor-1242		7.95	15.9	31.8	U
12672-29-6	Aroclor-1248		7.95	15.9	31.8	U
11097-69-1	Aroclor-1254		7.95	15.9	31.8	U
11096-82-5	Aroclor-1260		7.95	15.9	31.8	U
37324-23-5	Aroclor-1262		7.95	15.9	31.8	U
11100-14-4	Aroclor-1268		7.95	15.9	31.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.76	29.45	92.8	70 - 125	
Tetrachloro-m-xylene [2C]	31.76	27.98	88.1	70 - 125	
Decachlorobiphenyl	31.76	27.56	86.8	60 - 125	
Decachlorobiphenyl [2C]	31.76	29.12	91.7	60 - 125	

SJC 10/31/14

ANALYSIS DATA SHEET

VWW06-SD026-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-17	File ID:	071F7101.D
Sampled:	08/05/14 12:20	Prepared:	08/11/14 11:54	Analyzed:	08/13/14 05:27
Solids:	61.56	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08021	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		13.3	17.7	53.1	UT U SSL
12674-11-2	Aroclor-1016		6.64	13.3	26.6	U
11104-28-2	Aroclor-1221		6.64	13.3	26.6	U
11141-16-5	Aroclor-1232		6.64	13.3	26.6	U
53469-21-9	Aroclor-1242		6.64	13.3	26.6	U
12672-29-6	Aroclor-1248		6.64	13.3	26.6	U
11097-69-1	Aroclor-1254		6.64	13.3	26.6	U
11096-82-5	Aroclor-1260		6.64	13.3	26.6	U
37324-23-5	Aroclor-1262		6.64	13.3	26.6	U
11100-14-4	Aroclor-1268		6.64	13.3	26.6	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	26.56	17.99	67.7	70 - 125	
Tetrachloro-m-xylene [2C]	26.56	19.56	73.7	70 - 125	
Decachlorobiphenyl	26.56	15.80	59.5	60 - 125	
Decachlorobiphenyl [2C]	26.56	16.05	60.4	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD026-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-18	File ID:	072F7201.D
Sampled:	08/05/14 12:25	Prepared:	08/11/14 11:54	Analyzed:	08/13/14 05:40
Solids:	58.46	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08021	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry	DL	LOD	LOQ	Q
NA	Total PCBs		13.5	18.0	54.1	U
12674-11-2	Aroclor-1016		6.78	13.5	27.2	U
11104-28-2	Aroclor-1221		6.78	13.5	27.2	U
11141-16-5	Aroclor-1232		6.78	13.5	27.2	U
53469-21-9	Aroclor-1242		6.78	13.5	27.2	U
12672-29-6	Aroclor-1248		6.78	13.5	27.2	U
11097-69-1	Aroclor-1254		6.78	13.5	27.2	U
11096-82-5	Aroclor-1260		6.78	13.5	27.2	U
37324-23-5	Aroclor-1262		6.78	13.5	27.2	U
11100-14-4	Aroclor-1268		6.78	13.5	27.2	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	27.10	18.61	68.7	70 - 125	
Tetrachloro-m-xylene [2C]	27.10	20.02	73.9	70 - 125	
Decachlorobiphenyl	27.10	18.37	67.8	60 - 125	
Decachlorobiphenyl [2C]	27.10	18.65	68.8	60 - 125	

ANALYSIS DATA SHEET

VWW06-SD025-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-19	File ID:	060R6001.D
Sampled:	08/05/14 12:50	Prepared:	08/11/14 11:54	Analyzed:	08/27/14 02:09
Solids:	78.37	Preparation:	EXT_3546	Dilution:	1
Batch:	4H408021	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		10.4	13.8	41.4	~~U~~
12674-11-2	Aroclor-1016		5.19	10.4	20.8	U
11104-28-2	Aroclor-1221		5.19	10.4	20.8	U
11141-16-5	Aroclor-1232		5.19	10.4	20.8	U
53469-21-9	Aroclor-1242		5.19	10.4	20.8	U
12672-29-6	Aroclor-1248		5.19	10.4	20.8	U
11097-69-1	Aroclor-1254		5.19	10.4	20.8	U
11096-82-5	Aroclor-1260		5.19	10.4	20.8	U
37324-23-5	Aroclor-1262		5.19	10.4	20.8	U
11100-14-4	Aroclor-1268		5.19	10.4	20.8	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	20.73	12.07	58.2	70 - 125	*
Tetrachloro-m-xylene [2C]	20.73	12.45	60.1	70 - 125	*
Decachlorobiphenyl	20.73	8.765	42.3	60 - 125	*
Decachlorobiphenyl [2C]	20.73	9.746	47.0	60 - 125	*

ANALYSIS DATA SHEET

VWW06-SD025-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-19RE1	File ID:	063F6301.D
Sampled:	08/05/14 12:50	Prepared:	08/29/14 12:17	Analyzed:	09/05/14 04:12
Solids:	78.37	Preparation:	EXT_3546	Dilution:	1
Batch:	4H29007	Sequence: 4I25101	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs	30.4	10.6	14.1	42.2	H2J
12674-11-2	Aroclor-1016		5.29	10.6	21.2	H2U
11104-28-2	Aroclor-1221		5.29	10.6	21.2	H2U
11141-16-5	Aroclor-1232		5.29	10.6	21.2	H2U
53469-21-9	Aroclor-1242 [2C]	30.4	5.29	10.6	21.2	H2
12672-29-6	Aroclor-1248		5.29	10.6	21.2	H2U
11097-69-1	Aroclor-1254 [2C]		5.29	10.6	21.2	H2NU
11096-82-5	Aroclor-1260		5.29	10.6	21.2	H2U
37324-23-5	Aroclor-1262		5.29	10.6	21.2	H2U
11100-14-4	Aroclor-1268		5.29	10.6	21.2	H2U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	21.13	17.92	84.8	70 - 125	H2
Tetrachloro-m-xylene [2C]	21.13	17.83	84.4	70 - 125	H2
Decachlorobiphenyl	21.13	16.02	75.8	60 - 125	H2
Decachlorobiphenyl [2C]	21.13	18.33	86.8	60 - 125	H2

ANALYSIS DATA SHEET

VWW06-SD025-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-20REI	File ID:	020F2001.D
Sampled:	08/05/14 12:55	Prepared:	08/19/14 14:45	Analyzed:	08/26/14 16:25
Solids:	52.25	Preparation:	EXT_3546	Dilution:	1
Batch:	4H18026	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry	DL	LOD	LOQ	Q
NA	Total PCBs		15.8	21.1	63.2	U
12674-11-2	Aroclor-1016		7.92	15.8	31.7	U
11104-28-2	Aroclor-1221		7.92	15.8	31.7	U
11141-16-5	Aroclor-1232		7.92	15.8	31.7	U
53469-21-9	Aroclor-1242		7.92	15.8	31.7	U
12672-29-6	Aroclor-1248		7.92	15.8	31.7	U
11097-69-1	Aroclor-1254		7.92	15.8	31.7	U
11096-82-5	Aroclor-1260		7.92	15.8	31.7	U
37324-23-5	Aroclor-1262		7.92	15.8	31.7	U
11100-14-4	Aroclor-1268		7.92	15.8	31.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	31.65	24.17	76.4	70 - 125	
Tetrachloro-m-xylene [2C]	31.65	24.19	76.4	70 - 125	
Decachlorobiphenyl	31.65	23.10	73.0	60 - 125	
Decachlorobiphenyl [2C]	31.65	24.34	76.9	60 - 125	

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ANALYSIS DATA SHEET

VWW06-SD025-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-21	File ID:	079F7901.D
Sampled:	08/05/14 13:00	Prepared:	08/11/14 17:13	Analyzed:	08/13/14 07:16
Solids:	57.78	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08023	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.2	18.9	56.6	U
12674-11-2	Aroclor-1016		7.09	14.2	28.4	U
11104-28-2	Aroclor-1221		7.09	14.2	28.4	U
11141-16-5	Aroclor-1232		7.09	14.2	28.4	U
53469-21-9	Aroclor-1242		7.09	14.2	28.4	U
12672-29-6	Aroclor-1248		7.09	14.2	28.4	U
11097-69-1	Aroclor-1254		7.09	14.2	28.4	U
11096-82-5	Aroclor-1260		7.09	14.2	28.4	U
37324-23-5	Aroclor-1262		7.09	14.2	28.4	U
11100-14-4	Aroclor-1268		7.09	14.2	28.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	28.35	18.86	66.5	70 - 125	*
Tetrachloro-m-xylene [2C]	28.35	20.25	71.4	70 - 125	
Decachlorobiphenyl	28.35	19.70	69.5	60 - 125	
Decachlorobiphenyl [2C]	28.35	19.95	70.3	60 - 125	

QC 10/3/14

ANALYSIS DATA SHEET

VWW06-SD025-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-22	File ID:	080F8001.D
Sampled:	08/05/14 13:05	Prepared:	08/11/14 17:13	Analyzed:	08/13/14 07:30
Solids:	71.78	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08023	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.0	14.6	43.9	U
12674-11-2	Aroclor-1016		5.49	11.0	22.0	U
11104-28-2	Aroclor-1221		5.49	11.0	22.0	U
11141-16-5	Aroclor-1232		5.49	11.0	22.0	U
53469-21-9	Aroclor-1242		5.49	11.0	22.0	U
12672-29-6	Aroclor-1248		5.49	11.0	22.0	U
11097-69-1	Aroclor-1254		5.49	11.0	22.0	U
11096-82-5	Aroclor-1260		5.49	11.0	22.0	U
37324-23-5	Aroclor-1262		5.49	11.0	22.0	U
11100-14-4	Aroclor-1268		5.49	11.0	22.0	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	21.96	16.57	75.4	70 - 125	
Tetrachloro-m-xylene [2C]	21.96	17.87	81.4	70 - 125	
Decachlorobiphenyl	21.96	17.83	81.2	60 - 125	
Decachlorobiphenyl [2C]	21.96	17.98	81.9	60 - 125	

SDC-
10-13-14

ANALYSIS DATA SHEET

VWW06-SD024-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-23	File ID:	065F6501.D
Sampled:	08/05/14 13:25	Prepared:	08/11/14 17:13	Analyzed:	08/27/14 03:22
Solids:	55.41	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08023	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.8	19.8	59.3	WJ ~~U~~ ~~ESL~~
12674-11-2	Aroclor-1016		7.42	14.8	29.7	U
11104-28-2	Aroclor-1221		7.42	14.8	29.7	U
11141-16-5	Aroclor-1232		7.42	14.8	29.7	U
53469-21-9	Aroclor-1242		7.42	14.8	29.7	U
12672-29-6	Aroclor-1248		7.42	14.8	29.7	U
11097-69-1	Aroclor-1254		7.42	14.8	29.7	U
11096-82-5	Aroclor-1260		7.42	14.8	29.7	U
37324-23-5	Aroclor-1262		7.42	14.8	29.7	U
11100-14-4	Aroclor-1268		7.42	14.8	29.7	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.66	17.70	59.7	70 - 125	
Tetrachloro-m-xylene [2C]	29.66	18.97	64.0	70 - 125	
Decachlorobiphenyl	29.66	15.80	53.3	60 - 125	
Decachlorobiphenyl [2C]	29.66	17.85	60.2	60 - 125	

JLC 10/31/14

ANALYSIS DATA SHEET

VWW06-SD024-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-23RE1	File ID:	071F7101.D
Sampled:	08/05/14 13:25	Prepared:	08/29/14 12:17	Analyzed:	09/05/14 06:09
Solids:	55.41	Preparation:	EXT_3546	Dilution:	1
Batch:	4H29007	Sequence: 4I25101	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.7	19.5	58.6	H2U
12674-11-2	Aroclor-1016		7.34	14.7	29.4	H2U
11104-28-2	Aroclor-1221		7.34	14.7	29.4	H2U
11141-16-5	Aroclor-1232		7.34	14.7	29.4	H2U
53469-21-9	Aroclor-1242		7.34	14.7	29.4	H2U
12672-29-6	Aroclor-1248		7.34	14.7	29.4	H2U
11097-69-1	Aroclor-1254		7.34	14.7	29.4	H2U
11096-82-5	Aroclor-1260		7.34	14.7	29.4	H2U
37324-23-5	Aroclor-1262		7.34	14.7	29.4	H2U
11100-14-4	Aroclor-1268		7.34	14.7	29.4	H2U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.33	26.08	88.9	70 - 125	H2
Tetrachloro-m-xylene [2C]	29.33	26.12	89.0	70 - 125	H2
Decachlorobiphenyl	29.33	20.54	70.0	60 - 125	H2
Decachlorobiphenyl [2C]	29.33	23.37	79.7	60 - 125	H2

JKC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD024P-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-24	File ID:	068F6801.D
Sampled:	08/05/14 12:30	Prepared:	08/11/14 17:13	Analyzed:	08/27/14 04:06
Solids:	55.83	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08023	Sequence: 4H23912	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.4	19.2	57.5	UJ <SQL
12674-11-2	Aroclor-1016		7.20	14.4	28.9	U
11104-28-2	Aroclor-1221		7.20	14.4	28.9	U
11141-16-5	Aroclor-1232		7.20	14.4	28.9	U
53469-21-9	Aroclor-1242		7.20	14.4	28.9	U
12672-29-6	Aroclor-1248		7.20	14.4	28.9	U
11097-69-1	Aroclor-1254		7.20	14.4	28.9	U
11096-82-5	Aroclor-1260		7.20	14.4	28.9	U
37324-23-5	Aroclor-1262		7.20	14.4	28.9	U
11100-14-4	Aroclor-1268		7.20	14.4	28.9	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	28.80	18.80	65.3	70 - 125	✓
Tetrachloro-m-xylene [2C]	28.80	19.66	68.3	70 - 125	✓
Decachlorobiphenyl	28.80	15.43	53.6	60 - 125	✓
Decachlorobiphenyl [2C]	28.80	17.11	59.4	60 - 125	✓

GJC 10/31/14

ANALYSIS DATA SHEET

VWW06-SD024P-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-24RE1	File ID:	072F7201.D
Sampled:	08/05/14 13:30	Prepared:	08/29/14 12:17	Analyzed:	09/05/14 06:23
Solids:	55.83	Preparation:	EXT_3546	Dilution:	1
Batch:	4H29007	Sequence: 4I25101	Calibration:	4232001	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		14.2	18.9	56.8	exclude H2U 36
12674-11-2	Aroclor-1016		7.11	14.2	28.5	H2U
11104-28-2	Aroclor-1221		7.11	14.2	28.5	H2U
11141-16-5	Aroclor-1232		7.11	14.2	28.5	H2U
53469-21-9	Aroclor-1242 [2C]		7.11	14.2	28.5	H2U
12672-29-6	Aroclor-1248		7.11	14.2	28.5	H2U
11097-69-1	Aroclor-1254 [2C]		7.11	14.2	28.5	H2U
11096-82-5	Aroclor-1260		7.11	14.2	28.5	H2U
37324-23-5	Aroclor-1262		7.11	14.2	28.5	H2U
11100-14-4	Aroclor-1268		7.11	14.2	28.5	H2U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	28.43	23.63	83.1	70 - 125	H2
Tetrachloro-m-xylene [2C]	28.43	24.27	85.4	70 - 125	H2
Decachlorobiphenyl	28.43	20.72	72.9	60 - 125	H2
Decachlorobiphenyl [2C]	28.43	23.60	83.0	60 - 125	H2

JSC 10/3/14

ANALYSIS DATA SHEET

VWW06-SD024-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-25	File ID:	069F6901.D
Sampled:	08/05/14 13:35	Prepared:	08/11/14 17:13	Analyzed:	08/27/14 04:21
Solids:	50.03	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08023	Sequence: 4H23912	Calibration:	423200J	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		16.1	21.5	64.4	UJ U SSL
12674-11-2	Aroclor-1016		8.06	16.1	32.3	U
11104-28-2	Aroclor-1221		8.06	16.1	32.3	U
11141-16-5	Aroclor-1232		8.06	16.1	32.3	U
53469-21-9	Aroclor-1242		8.06	16.1	32.3	U
12672-29-6	Aroclor-1248		8.06	16.1	32.3	U
11097-69-1	Aroclor-1254		8.06	16.1	32.3	U
11096-82-5	Aroclor-1260		8.06	16.1	32.3	U
37324-23-5	Aroclor-1262		8.06	16.1	32.3	U
11100-14-4	Aroclor-1268		8.06	16.1	32.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	32.22	23.00	71.4	70 - 125	
Tetrachloro-m-xylene [2C]	32.22	23.86	74.0	70 - 125	
Decachlorobiphenyl	32.22	16.62	51.6	60 - 125	✓
Decachlorobiphenyl [2C]	32.22	18.01	55.9	60 - 125	✓

JLC
10/31/14

ANALYSIS DATA SHEET

VWW06-SD024-4854

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Solid	Laboratory ID:	1408041-26	File ID:	089F8901.D
Sampled:	08/05/14 13:40	Prepared:	08/11/14 17:13	Analyzed:	08/13/14 09:33
Solids:	67.92	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08023	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		11.7	15.6	46.7	U
12674-11-2	Aroclor-1016		5.85	11.7	23.4	U
11104-28-2	Aroclor-1221		5.85	11.7	23.4	U
11141-16-5	Aroclor-1232		5.85	11.7	23.4	U
53469-21-9	Aroclor-1242		5.85	11.7	23.4	U
12672-29-6	Aroclor-1248		5.85	11.7	23.4	U
11097-69-1	Aroclor-1254		5.85	11.7	23.4	U
11096-82-5	Aroclor-1260		5.85	11.7	23.4	U
37324-23-5	Aroclor-1262		5.85	11.7	23.4	U
11100-14-4	Aroclor-1268		5.85	11.7	23.4	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	23.39	16.91	72.3	70 - 125	
Tetrachloro-m-xylene [2C]	23.39	18.17	77.7	70 - 125	
Decachlorobiphenyl	23.39	17.35	74.2	60 - 125	
Decachlorobiphenyl [2C]	23.39	17.75	75.9	60 - 125	

QC 10/13/14

ANALYSIS DATA SHEET

VWW06-SD024-7278

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU6	
Matrix:	Solid	Laboratory ID:	1408041-27	File ID:	090F9001.D
Sampled:	08/05/14 13:45	Prepared:	08/11/14 17:13	Analyzed:	08/13/14 09:47
Solids:	68.83	Preparation:	EXT_3546	Dilution:	1
Batch:	4H08023	Sequence: 4H22602	Calibration:	4209006	Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
NA	Total PCBs		12.0	16.0	48.1	LJ U SDL
12674-11-2	Aroclor-1016		6.02	12.0	24.1	U
11104-28-2	Aroclor-1221		6.02	12.0	24.1	U
11141-16-5	Aroclor-1232		6.02	12.0	24.1	U
53469-21-9	Aroclor-1242		6.02	12.0	24.1	U
12672-29-6	Aroclor-1248		6.02	12.0	24.1	U
11097-69-1	Aroclor-1254		6.02	12.0	24.1	U
11096-82-5	Aroclor-1260		6.02	12.0	24.1	U
37324-23-5	Aroclor-1262		6.02	12.0	24.1	U
11100-14-4	Aroclor-1268		6.02	12.0	24.1	U

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	24.05	16.90	70.2	70 - 125	
Tetrachloro-m-xylene [2C]	24.05	17.70	73.6	70 - 125	
Decachlorobiphenyl	24.05	9.694	40.3	60 - 125	✓
Decachlorobiphenyl [2C]	24.05	9.999	41.6	60 - 125	✓

MC
10/13/14

ANALYSIS DATA SHEET

VWW06-EB01-080614

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:	Water	Laboratory ID:	1408041-28	File ID:	041R4101.D
Sampled:	08/06/14 11:30	Prepared:	08/08/14 17:51	Analyzed:	08/11/14 19:53
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 4H07026 Sequence: 4H22502 Calibration: 4209006 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
NA	Total PCBs		0.111	0.231	0.463	U
12674-11-2	Aroclor-1016		0.111	0.231	0.463	U
11104-28-2	Aroclor-1221		0.111	0.231	0.463	U
11141-16-5	Aroclor-1232		0.111	0.231	0.463	U
53469-21-9	Aroclor-1242		0.111	0.231	0.463	U
12672-29-6	Aroclor-1248		0.111	0.231	0.463	U
11097-69-1	Aroclor-1254		0.111	0.231	0.463	U
11096-82-5	Aroclor-1260		0.111	0.231	0.463	U
37324-23-5	Aroclor-1262		0.111	0.231	0.463	U
11100-14-4	Aroclor-1268		0.111	0.231	0.463	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	0.4630	0.3179	68.7	25 - 140	
Tetrachloro-m-xylene [2C]	0.4630	0.3344	72.2	25 - 140	
Decachlorobiphenyl	0.4630	0.2938	63.5	40 - 135	
Decachlorobiphenyl [2C]	0.4630	0.3068	66.3	40 - 135	

10/13/14

ANALYSIS DATA SHEET

VWW06-SD025-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vicinues CTO 113 SWMU6	
Matrix:		Laboratory ID:	41108021-MS2	File ID:	061F6101.D
Sampled:		Prepared:		Analyzed:	08/27/14 02:24
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 41108021 Sequence: 41123912 Calibration: 4232001 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	QL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		5.20	10.4	20.8	U
11104-28-2	Aroclor-1221		5.20	10.4	20.8	U
11141-16-5	Aroclor-1232		5.20	10.4	20.8	U
53469-21-9	Aroclor-1242		5.20	10.4	20.8	U
12672-29-6	Aroclor-1248		5.20	10.4	20.8	U
11097-69-1	Aroclor-1254	**262.4**	5.20	10.4	20.8	P
11096-82-5	Aroclor-1260		5.20	10.4	20.8	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	20.80	13.21	63.5	70 - 125	
Decachlorobiphenyl	20.80	13.27	63.8	60 - 125	

JAC
102814

041

ANALYSIS DATA SHEET

VWW06-SD025-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H08021-MS2	File ID:	961R6101.D
Sampled:		Prepared:		Analyzed:	08/27/14 02:24
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H08021 Sequence: 4H23912 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		5.20	10.4	20.8	U
11104-28-2	Aroclor-1221 [2C]		5.20	10.4	20.8	U
11141-16-5	Aroclor-1232 [2C]		5.20	10.4	20.8	U
53469-21-9	Aroclor-1242 [2C]		5.20	10.4	20.8	U
12672-29-6	Aroclor-1248 [2C]		5.20	10.4	20.8	U
11097-69-1	Aroclor-1254 [2C]	415.4	5.20	10.4	20.8	P
11096-82-5	Aroclor-1260 [2C]		5.20	10.4	20.8	UX

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	20.80	13.67	65.7	70 - 125	
Decachlorobiphenyl [2C]	20.80	14.79	71.1	60 - 125	

JAC
102814

042

ANALYSIS DATA SHEET

VWW06-SD025-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU6	
Matrix:		Laboratory ID:	4H08021-MSD2	File ID:	062F6301.D
Sampled:		Prepared:		Analyzed:	08/27/14 02:39
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H08021 Sequence: 4H23913 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		5.29	10.6	21.2	U
11104-28-2	Aroclor-1221		5.29	10.6	21.2	U
11141-16-5	Aroclor-1232		5.29	10.6	21.2	U
53469-21-9	Aroclor-1242		5.29	10.6	21.2	U
12672-29-6	Aroclor-1248		5.29	10.6	21.2	U
11097-69-1	Aroclor-1254	**295.4**	5.29	10.6	21.2	P
11096-82-5	Aroclor-1260		5.29	10.6	21.2	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	21.15	15.68	74.1	70 - 125	
Decachlorobiphenyl	21.15	14.29	67.6	60 - 125	

JAC
102814

043

ANALYSIS DATA SHEET

VWW06-SD025-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H08021-MSD2	File ID:	062R6201.D
Sampled:		Prepared:		Analyzed:	08/27/14 02:39
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H08021 Sequence: 4H23912 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		5.29	10.6	21.2	U
11104-28-2	Aroclor-1221 [2C]		5.29	10.6	21.2	U
11141-16-5	Aroclor-1232 [2C]		5.29	10.6	21.2	U
53469-21-9	Aroclor-1242 [2C]		5.29	10.6	21.2	U
12672-29-6	Aroclor-1248 [2C]		5.29	10.6	21.2	U
11097-69-1	Aroclor-1254 [2C]	449.7	5.29	10.6	21.2	P
11096-82-5	Aroclor-1260 [2C]		5.29	10.6	21.2	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	21.15	16.14	76.3	70 - 125	
Decachlorobiphenyl [2C]	21.15	16.14	76.3	60 - 125	

gac
102814

044

ANALYSIS DATA SHEET

VWW06-SD024-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H08023-MS1	File ID:	066F6601.D
Sampled:		Prepared:		Analyzed:	08/27/14 03:37
Solids:		Preparation:	EXT 3546	Dilution:	

Batch: 4H08023 Sequence: 4H23912 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		7.44	14.9	29.8	U
11104-28-2	Aroclor-1221		7.44	14.9	29.8	U
11141-16-5	Aroclor-1232		7.44	14.9	29.8	U
53469-21-9	Aroclor-1242		7.44	14.9	29.8	U
12672-29-6	Aroclor-1248		7.44	14.9	29.8	U
11097-69-1	Aroclor-1254	308.1	7.44	14.9	29.8	
11096-82-5	Aroclor-1260		7.44	14.9	29.8	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.74	19.67	66.1	70 - 125	
Decachlorobiphenyl	29.74	8.112	27.3	60 - 125	

GJC
102814

045

ANALYSIS DATA SHEET

VWW06-SD024-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU6	
Matrix:		Laboratory ID:	41408023-MS1	File ID:	066R6601.D
Sampled:		Prepared:		Analyzed:	08/27/14 03:37
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H08023 Sequence: 4H23912 Calibration: 4232001 Instrument: GB-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		7.44	14.9	29.8	U
11104-28-2	Aroclor-1221 [2C]		7.44	14.9	29.8	U
11141-16-5	Aroclor-1232 [2C]		7.44	14.9	29.8	U
53469-21-9	Aroclor-1242 [2C]		7.44	14.9	29.8	U
12672-29-6	Aroclor-1248 [2C]		7.44	14.9	29.8	U
11097-69-1	Aroclor-1254 [2C]	315.5	7.44	14.9	29.8	
11096-82-5	Aroclor-1260 [2C]		7.44	14.9	29.8	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	29.74	20.71	69.6	70 - 125	
Decachlorobiphenyl [2C]	29.74	8.850	29.8	60 - 125	

JAC
102814

046

ANALYSIS DATA SHEET

VWW06-SD024-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	4H08023-MSD1	File ID:	0675670LD
Sampled:		Prepared:		Analyzed:	08/27/14 03:51
Solids:		Preparation:	EXT_3546	Dilution:	
Batch:	4H08023	Sequence:	4H23912	Calibration:	4232001

Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016		7.46	14.9	29.9	U
11104-28-2	Aroclor-1221		7.46	14.9	29.9	U
11141-16-5	Aroclor-1232		7.46	14.9	29.9	U
53469-21-9	Aroclor-1242		7.46	14.9	29.9	U
12672-29-6	Aroclor-1248		7.46	14.9	29.9	U
11097-69-1	Aroclor-1254	338.8	7.46	14.9	29.9	
11096-82-5	Aroclor-1260		7.46	14.9	29.9	U

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	29.82	18.52	62.1	70 - 125	
Decachlorobiphenyl	29.82	15.15	50.8	60 - 125	

JAC
10/28/14

047

ANALYSIS DATA SHEET

VWW06-SD024-0006

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	41108023-MSD1	File ID:	067R6701.D
Sampled:		Prepared:		Analyzed:	08/27/14 03:51
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 41108023 Sequence: 41123912 Calibration: 4232001 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]		7.46	14.9	29.9	U
11104-28-2	Aroclor-1221 [2C]		7.46	14.9	29.9	U
11141-16-5	Aroclor-1232 [2C]		7.46	14.9	29.9	U
53469-21-9	Aroclor-1242 [2C]		7.46	14.9	29.9	U
12672-29-6	Aroclor-1248 [2C]		7.46	14.9	29.9	U
11097-69-1	Aroclor-1254 [2C]	367.5	7.46	14.9	29.9	
11096-82-5	Aroclor-1260 [2C]		7.46	14.9	29.9	UX

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	29.82	19.21	64.4	70 - 125	
Decachlorobiphenyl [2C]	29.82	16.43	55.1	60 - 125	

JAC
10/28/14

ANALYSIS DATA SHEET

VWW06-SD027-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU16	
Matrix:		Laboratory ID:	4H18026-MS1	File ID:	016F1601.D
Sampled:		Prepared:		Analyzed:	08/26/14 15:27
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H18026 Sequence: 4H23912 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016	275.8	11.0	21.9	43.9	
11104-28-2	Aroclor-1221		11.0	21.9	43.9	U
11141-16-5	Aroclor-1232		11.0	21.9	43.9	U
53469-21-9	Aroclor-1242		11.0	21.9	43.9	U
12672-29-6	Aroclor-1248		11.0	21.9	43.9	U
11097-69-1	Aroclor-1254		11.0	21.9	43.9	U
11096-82-5	Aroclor-1260	210.2	11.0	21.9	43.9	

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	43.84	34.95	79.7	70 - 125	
Decachlorobiphenyl	43.84	37.90	86.4	60 - 125	

JAC
10/28/14

049

ANALYSIS DATA SHEET

VWW06-SD027-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWM116	
Matrix:		Laboratory ID:	4H18026-MS1	File ID:	016R1601.D
Sampled:		Prepared:		Analyzed:	08/26/14 15:27
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 4H18026 Sequence: 4H23912 Calibration: 4232001 Instrument: GC-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]	287.4	11.0	21.9	43.9	
11104-28-2	Aroclor-1221 [2C]		11.0	21.9	43.9	U
11141-16-5	Aroclor-1232 [2C]		11.0	21.9	43.9	U
53469-21-9	Aroclor-1242 [2C]		11.0	21.9	43.9	U
12672-29-6	Aroclor-1248 [2C]		11.0	21.9	43.9	U
11097-69-1	Aroclor-1254 [2C]		11.0	21.9	43.9	U
11096-82-5	Aroclor-1260 [2C]	264.1	11.0	21.9	43.9	

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	43.84	35.57	81.1	70 - 125	
Decachlorobiphenyl [2C]	43.84	39.76	90.7	60 - 125	

SAC
10/28/14

050

ANALYSIS DATA SHEET

VWW06-SD027-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWM016	
Matrix:		Laboratory ID:	41118026-MS01	File ID:	01701701.D
Sampled:		Prepared:		Analyzed:	08/26/14 15:41
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 41118026 Sequence: 41123912 Calibration: 4232001 Instrument: GL-ECD3

CAS NO.	COMPOUND	ONC (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016	333.2	11.1	22.1	44.3	
11104-28-2	Aroclor-1221		11.1	22.1	44.3	U
11141-16-5	Aroclor-1232		11.1	22.1	44.3	U
53469-21-9	Aroclor-1242		11.1	22.1	44.3	U
12672-29-6	Aroclor-1248		11.1	22.1	44.3	U
11097-69-1	Aroclor-1254		11.1	22.1	44.3	U
11096-82-5	Aroclor-1260	248.3	11.1	22.1	44.3	

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene	44.22	39.03	88.3	70 - 125	
Decachlorobiphenyl	44.22	41.18	93.1	60 - 125	

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051

ANALYSIS DATA SHEET

VWW06-SD027-2430

Laboratory:	Empirical Laboratories, LLC		SDG:	1408041	
Client:	CH2M Hill, Inc.		Project:	NTR Vieques CTO 113 SWMU 6	
Matrix:		Laboratory ID:	41118026-MSD1	File ID:	017R1701.D
Sampled:		Prepared:		Analyzed:	08/26/14 15:41
Solids:		Preparation:	EXT_3546	Dilution:	

Batch: 41118026 Sequence: 41123912 Calibration: 4232001 Instrument: GL-ECD3

CAS NO.	COMPOUND	CONC. (ug/Kg dry)	DL	LOD	LOQ	Q
12674-11-2	Aroclor-1016 [2C]	**331.2**	11.1	22.1	44.3	
11104-28-2	Aroclor-1221 [2C]		11.1	22.1	44.3	U
11141-16-5	Aroclor-1232 [2C]		11.1	22.1	44.3	U
53469-21-9	Aroclor-1242 [2C]		11.1	22.1	44.3	U
12672-29-6	Aroclor-1248 [2C]		11.1	22.1	44.3	U
11097-69-1	Aroclor-1254 [2C]		11.1	22.1	44.3	U
11096-82-5	Aroclor-1260 [2C]	**312.9**	11.1	22.1	44.3	

Total Target Analytes Reported: 14

SYSTEM MONITORING COMPOUND	ADDED (ug/Kg dry)	CONC (ug/Kg dry)	% REC	QC LIMITS	Q
Tetrachloro-m-xylene [2C]	44.22	39.41	89.1	70 - 125	
Decachlorobiphenyl [2C]	44.22	43.57	98.5	60 - 125	

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ANALYSIS DATA SHEET

VWW06-SD033-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 09:05
% Solids: 51.29

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-01
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	307	1.11	2.23	3.71	2		SW6010C	4H26025	09/02/14 13:11
7440-66-6	Zinc	545	3.71	7.43	14.9	2		SW6010C	4H26025	09/02/14 13:11

10/14/14

ANALYSIS DATA SHEET

VWW06-SD033-2430

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408041-02
Sampled:	08/05/14 09:10	Received:	08/07/14 08:50
% Solids:	60.42		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.91	0.983	1.97	3.28	2	DJ	SW6010C	4H26025	09/02/14 13:13
7440-66-6	Zinc	6.74	3.28	6.56	13.1	2	DJ	SW6010C	4H26025	09/02/14 13:13

ANALYSIS DATA SHEET

VWW06-SD033-4854

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408041-03
Sampled:	08/05/14 09:15	Received:	08/07/14 08:50
% Solids:	65.90		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.42	0.875	1.75	2.92	2	DJ	SW6010C	4H26025	09/02/14 13:20
7440-66-6	Zinc	10.6	2.92	5.84	11.7	2	BJN	SW6010C	4H26025	09/02/14 13:20

JLC 10/1/14

ANALYSIS DATA SHEET

VWW06-SD033-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 09:20
% Solids: 72.57

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-04
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.27	0.787	1.57	2.62	2	DJ	SW6010C	4H26025	09/02/14 13:24
7440-66-6	Zinc	9.36	2.62	5.23	10.3	2	DJX	SW6010C	4H26025	09/02/14 13:24

ANALYSIS DATA SHEET

VWW06-SD028-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 09:40
% Solids: 59.96

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-05
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	357	0.953	1.91	3.18	2	B	SW6010C	4H26025	09/02/14 13:29
7440-66-6	Zinc	409	3.18	6.35	12.7	2	BJ	SW6010C	4H26025	09/02/14 13:29

JC 10/1/14

ANALYSIS DATA SHEET

VWW06-SD028-2430

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408041-06
Sampled:	08/05/14 09:45	Received:	08/07/14 08:50
% Solids:	51.16		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	4.11	1.14	2.28	3.80	2	J	SW6010C	4H26025	09/02/14 13:33
7440-66-6	Zinc	7.89	3.80	7.59	15.2	2	BJ	SW6010C	4H26025	09/02/14 13:33

SDC 10/1/14

ANALYSIS DATA SHEET

VWW06-SD028P-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 09:50
% Solids: 52.21

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-07
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	4.15	1.15	2.30	3.83	2	B	SW6010C	4H26025	09/02/14 13:38
7440-66-6	Zinc	8.13	3.83	7.66	15.3	2	B	SW6010C	4H26025	09/02/14 13:38

JBC 10/1/14

ANALYSIS DATA SHEET

VWW06-SD028-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 09:55
% Solids: 67.88

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-08
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.68	0.921	1.84	3.07	2	J0	SW6010C	4H26025	09/02/14 13:42
7440-66-6	Zinc	4.42	3.07	6.14	12.3	2	J0	SW6010C	4H26025	09/02/14 13:42

ANALYSIS DATA SHEET

VWW06-SD028-7278

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408041-09
Sampled:	08/05/14 10:00	Received:	08/07/14 08:50
% Solids:	71.33		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.52	0.809	1.62	2.70	2	DJ	SW6010C	4H26025	09/02/14 13:47
7440-66-6	Zinc	6.48	2.70	5.39	10.8	2	DJ	SW6010C	4H26025	09/02/14 13:47

JAC 10/8/14

ANALYSIS DATA SHEET

VWW06-SD027-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 10:25
% Solids: 64.65

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-10
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	455	0.919	1.84	3.06	2	B	SW6010C	4H26025	09/02/14 14:27
7440-66-6	Zinc	439	3.06	5.15	12.3	2	BV	SW6010C	4H26025	09/02/14 14:27

SJC 11/4/14

061A

ANALYSIS DATA SHEET

VWW06-SD027-2430

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408041-11
Sampled:	08/05/14 10:30	Received:	08/07/14 08:50
% Solids:	37.51		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	3.49	0.808	1.62	2.69	1	J BT	SW6010C	4H26025	09/02/14 13:52
7440-66-6	Zinc	5.64	5.39	10.8	21.5	2	J BJN BT	SW6010C	4H26025	09/02/14 21:14

JBC 9/10/14

062

ANALYSIS DATA SHEET

VWW06-SD027-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 10:35
% Solids: 62.46

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-12
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.82	0.970	1.94	3.23	2	BJ	SW6010C	4H26025	09/02/14 14:31
7440-66-6	Zinc	13.6	3.23	6.47	12.9	2	BJ	SW6010C	4H26025	09/02/14 14:31

SMC 11/14/14

ANALYSIS DATA SHEET

VWW06-SD027-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 10:40
% Solids: 68.73

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-13
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	2.07	0.909	1.82	3.03	2	BJ	SW6010C	4H26025	09/02/14 14:36
7440-66-6	Zinc	8.51	3.03	6.06	12.1	2	BJN	SW6010C	4H26025	09/02/14 14:36

ANALYSIS DATA SHEET

VWW06-SD026-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 12:05
% Solids: 73.65

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-14
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	363	0.840	1.68	2.80	2	D	SW6010C	4H26025	09/02/14 14:40
7440-66-6	Zinc	892	2.80	5.60	11.2	2	DN	SW6010C	4H26025	09/02/14 14:40

JLC 11/14

063A

ANALYSIS DATA SHEET

VWW06-SD026-2430

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408041-15
Sampled:	08/05/14 12:10	Received:	08/07/14 08:50
% Solids:	50.12		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	22.7	1.23	2.47	4.11	2	J FD	SW6010C	4H26025	09/02/14 14:45
7440-66-6	Zinc	47.7	4.11	8.23	16.5	2	J FD	SW6010C	4H26025	09/02/14 14:45

JAC 10/11/14

ANALYSIS DATA SHEET

VWW06-SD026P-2430

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408041-16
Sampled:	08/05/14 12:15	Received:	08/07/14 08:50
% Solids:	50.79		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	14.8	1.23	2.46	4.10	2	J [illegible]	SW6010C	4H26025	09/02/14 14:49
7440-66-6	Zinc	104	4.10	8.20	16.4	2	J [illegible]	SW6010C	4H26025	09/02/14 14:49

ANALYSIS DATA SHEET

VWW06-SD026-4854

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408041-17
Sampled:	08/05/14 12:20	Received:	08/07/14 08:50
% Solids:	61.56		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.42	0.965	1.93	5.22	2	DJ	SW6010C	4H26025	09/02/14 14:54
7440-66-6	Zinc	3.33	3.22	6.43	12.9	2	DJ	SW6010C	4H26025	09/02/14 14:54

JAG 10/1/14

ANALYSIS DATA SHEET

VWW06-SD026-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 12:25
% Solids: 58.46

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-18
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.60	0.996	1.99	3.32	2	DJ	SW6010C	4H26025	09/02/14 14:58
7440-66-6	Zinc	13.7	3.32	8.64	13.7	2	DJ	SW6010C	4H26025	09/02/14 14:58

ANALYSIS DATA SHEET

VWW06-SD025-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 12:50
% Solids: 78.37

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-19
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	300	0.375	0.751	1.25	1		SW6010C	4H26025	09/02/14 15:03
7440-66-6	Zinc	509	1.25	2.50	5.00	1	N	SW6010C	4H26025	09/02/14 15:03

JMC 10/1/14

ANALYSIS DATA SHEET

VWW06-SD025-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 12:55
% Solids: 52.25

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-20
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.95	1.17	2.34	3.91	2	J	SW6010C	#H26025	09/02/14 15:26
7440-66-6	Zinc		3.91	7.81	15.6	2	ND	SW6010C	4H26025	09/02/14 15:26

JAC 10/14/14

ANALYSIS DATA SHEET

VWW06-SD025-4854

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 13:00
% Solids: 57.78

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-21
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.42	0.998	2.00	3.33	2	DJ	SW6010C	4H26024	09/02/14 15:53
7440-66-6	Zinc	6.13	3.33	6.66	13.3	2	DJ	SW6010C	4H26024	09/02/14 15:53

SJC 10/1/14

ANALYSIS DATA SHEET

VWW06-SD025-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 13:05
% Solids: 71.78

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-22
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.04	0.828	1.66	2.76	2	DJ	SW6010C	4H26024	09/02/14 15:57
7440-66-6	Zinc	8.73	2.76	5.52	11.0	2	DJ	SW6010C	4H26024	09/02/14 15:57

SDC 10/1/14

071

ANALYSIS DATA SHEET

VWW06-SD024-0006

Laboratory: Empirical Laboratories LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 13:25
% Solids: 55.41

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-23
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	160	1.04	2.08	3.47	2	D	SW6010C	4H26024	09/02/14 16:02
7440-66-6	Zinc	200	3.47	6.94	13.9	2	D	SW6010C	4H26024	09/02/14 16:02

ANALYSIS DATA SHEET

VWW06-SD024P-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 13:30
% Solids: 55.83

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-24
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	194	1.09	2.17	3.62	2	D	SW6010C	4H26024	09/02/14 16:06
7440-66-6	Zinc	226	3.62	7.24	14.5	2	D	SW6010C	4H26024	09/02/14 16:06

AC 10/1/14

ANALYSIS DATA SHEET

VWW06-SD024-2430

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408041-25
Sampled:	08/05/14 13:35	Received:	08/07/14 08:50
% Solids:	50.03		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.87	1.26	2.52	4.21	2	DJ	SW6010C	4H26024	09/02/14 16:11
7440-66-6	Zinc		4.21	8.42	16.8	2	U	SW6010C	4H26024	09/02/14 16:11

JAC 10/1/14

ANALYSIS DATA SHEET

VWW06-SD024-4854

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid	Laboratory ID:	1408041-26
Sampled:	08/05/14 13:40	Received:	08/07/14 08:50
% Solids:	67.92		

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.25	0.883	1.77	2.94	2	DJ	SW6010C	4H26024	09/02/14 16:15
7440-66-6	Zinc	8.51	2.94	5.89	11.8	2	DJ	SW6010C	4H26024	09/02/14 16:15

JLC 10/1/14

ANALYSIS DATA SHEET

VWW06-SD024-7278

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
Sampled: 08/05/14 13:45
% Solids: 68.83

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 1408041-27
Received: 08/07/14 08:50

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	1.67	0.881	1.76	2.94	2	J	SW6010C	4H26024	09/02/14 16:20
7440-66-6	Zinc	10.0	2.94	5.87	11.7	2	J	SW6010C	4H26024	09/02/14 16:20

AC 10/11/14

ANALYSIS DATA SHEET

VWW06-EB01-080614

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Water	Laboratory ID:	1408041-28
Sampled:	08/06/14 11:30	Received:	08/07/14 08:50

CAS NO.	Analyte	Conc. (ug/L)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead		1.50	3.00	5.00	1	U	SW6010C	4H11011	08/18/14 15:04
7440-66-6	Zinc		5.00	10.0	20.0	1	U	SW6010C	4H11011	08/18/14 15:04

SJC
10/1/14

ANALYSIS DATA SHEET

VWW06-SD027-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
% Solids: 37.51

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 41126025-DUP1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	4.829	4.04	8.08	13.3	5	J	SW6010C	41126025	09/02/14 14:10

JLC
10/28/14

ANALYSIS DATA SHEET

VWW06-SD025-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M HILL Inc
Matrix: Soils
% Solids: 78.37

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 4H26025-DUP2

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	301.0	1.88	3.75	6.25	5	J	SW6010C	4H26025	09/02/14 15:22
7440-66-6	Zinc	493.4	6.25	12.5	25.0	5	J	SW6010C	4H26025	09/02/14 15:22

QC
10/28/14

079

ANALYSIS DATA SHEET

VWW06-SD027-2430

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
% Solids: 37.51

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 41126025-DUP3

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7440-66-6	Zinc	ND	26.9	53.9	108	10	U	SW6010C	41126025	09/02/14 21:18

QC 102814

080

ANALYSIS DATA SHEET

VWW06-SD027-2430

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 37.51

SDG: 1408041

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 41126025-MS1

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	149.2	0.833	1.67	2.78	1		SW6010C	3126025	09/02/14 13:56
7440-66-6	Zinc	323.9	2.78	5.53	11.1	1		SW6010C	4H26025	09/02/14 13:56

JLC 10/22/14

081

ANALYSIS DATA SHEET

VWW06-SD025-0006

Laboratory: Empirical Laboratories, LLC
Client: CH2M Hill, Inc.
Matrix: Solid
% Solids: 78.37

SDG: 1408041
Project: NTR Vieques CTO 113 SWMU 6
Laboratory ID: 4H26025-MS2

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	486.1	0.391	0.781	1.30	1		SW6010C	4H26025	09/02/14 15:08
7440-66-6	Zinc	848.7	1.30	2.60	5.21	1		SW6010C	4H26025	09/02/14 15:08

082

ANALYSIS DATA SHEET

WWW06-SD027-2430

Laboratory: Empirical Laboratories, LLC

Client: CH2M Hill, Inc.

Matrix: Solid

% Solids: 37.51

SDG: 1408041

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 4H26025-MS01

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	145.6	0.833	1.67	2.78	1		SW6010C	4H26025	09/02/14 14:01
7440-66-6	Zinc	315.3	2.78	3.55	11.1	1		SW6010C	4H26025	09/02/14 14:01

JAC
10/28/14

083

ANALYSIS DATA SHEET

VWW06-SD025-0006

Laboratory: Empirical Laboratories, LLC

Client: CH2M HILL Inc

Matrix: Solid

% Solids: 78.37

SDG: 1408041

Project: NTR Vieques CTO 113 SWMU 6

Laboratory ID: 41126025-MSD2

CAS NO.	Analyte	Conc. (mg/Kg dry)	DL	LOD	LOQ	D.F.	Q	Method	Batch	Analyzed
7439-92-1	Lead	444.2	0.375	0.751	1.25	1		SW6010C	41126025	09/02/14 15:12
7440-66-6	Zinc	797.9	1.25	2.50	5.00	1		SW6010C	41126025	09/02/14 15:17

JAC 102514

084

Sample Delivery Group Case Narrative

Receipt Information:

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

Changes to the Revision:

Revision 01: The package was revised to replace the "matrix spike", "matrix spike duplicate", and "duplicate" on the Analysis Data Sheets with the client ID of the parent sample at the request of the client.

Analytical Information:

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. Sample preparation and dilution information is provided within the final results report and at the beginning of each form set. The following information is provided specific to individual methods:

SW8082B:

Note – Samples 1408041-02, -06, -07, -11, -15, -16, and -20 were re-extracted due to surrogate exceedences as 1408041-02RE1, -06RE1, -07RE1, -11RE1, -15RE1, -16RE1, and -20RE1. Only the re-analyses are included in the report. Sample 1408041-14 is qualified with a C9 for Aroclor-1254 to indicate that the DL and LOD were raised due to sample matrix.

The following were extracted after the method recommended holding time of 14 days:
1408041-10RE1, -19RE1, -23RE1, and -24RE1 were extracted 24 days after sampling; note – the samples were re-extracted due to surrogate exceedences

The following surrogates exceeded criteria:
Tetrachloro-m-xylene with a negative bias on both columns in 1408041-01, -08, -10, -19, -23, -24, 4H08021-MS2, 4H08023-MS1, and –MSD1 and on column 1 in 1408041-03, -05, -12, -17, -18, and -21
Decachlorobiphenyl with a negative bias on both columns in 1408041-10, -19, -24, -25, -27, 4H08023-MS1, and –MSD1 and on column 1 in 1408041-17 and -23
Note – Samples 1408041-10, -19, -23, and -24 were re-extracted since 3 surrogates exceeded criteria

with a negative bias. Both are included in the report. Samples with less than 3 surrogates exceeding criteria were not re-extracted.

The following matrix spikes exceeded criteria:
4H18026-MS1/MSD1 (1408041-11RE1) with a negative bias on column 1 for Aroclor-1260
4H29007-MS1/MSD1 (1408041-19RE1) with a negative bias on column 2 for Aroclor-1254 and exceeded relative percent difference criteria on both columns for Aroclor-1254
Note – The associated batch spikes are within criteria.

The following continuing calibration verifications exceeded criteria:
4H23912-CCVI with a positive bias on column 2 for Aroclor-1260; note – no positive results were detected in the associated samples

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

SW6010C:
The following matrix spikes exceeded criteria:
4H26025-MS1/MSD1 (1408041-19) with a positive bias for Zinc and exceeded criteria for Lead; note – the parent sample concentration for Lead is greater than 4 times the amount spiked and the associated batch spike is within criteria
No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

086

1, 78041

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 ♦ Nashville, TN 37228 ♦ 615-345-1115 ♦ (fax) 615-846-5426

1 of 3

18922

Send Results to:

Name Juliana Dean
Company CH2M HILL
Address 5701 Cleveland Str Suite 360
City Virginia Beach
State, Zip VA 23462
Phone 757-671-6232
Fax
E-mail juliana.dean@ch2m.com

Project No./Name: 404422.FI.SW S6

Send Invoice to:

Name Same
Company
Address
City
State, Zip
Phone
Fax
E-mail

Sampler's (Signature):

Analysis Requirements: Metals 6010C; PCB 8082A

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres.
01	08/05/14 0905	VWW06-SD033-0006	SD	✓	✓		2	
02	08/05/14 0910	VWW06-SD033-2430	SD	✓	✓		2	
03	08/05/14 0915	VWW06-SD033-4854	SD	✓	✓		2	
04	08/05/14 0920	VWW06-SD033-7278	SD	✓	✓		2	
05	08/05/14 0940	VWW06-SD028-0006	SD	✓	✓		2	
06	08/05/14 0945	VWW06-SD028-2430	SD	✓	✓		2	
07	08/05/14 0950	VWW06-SD028P-2430	SD	✓	✓		2	
08	08/05/14 0955	VWW06-SD028-4854	SD	✓	✓		2	
09	08/05/14 1000	VWW06-SD028-7278	SD	✓	✓		2	
10	08/05/14 1025	VWW06-SD027-0006	SD	✓	✓		2	
11	08/05/14 1030	VWW06-SD027-2430	SD	✓	✓		2	
↓	08/05/14 1030	VWW06-SD027-2430-MS	SD	✓	✓		2	

	Date/Time	Received By: (Signature)
Sample Kit Prep'd by: (Signature)		
Relinquished by: (Signature)	8/6/14 12m	Received By: (Signature)
Relinquished by: (Signature)		Received By: (Signature)
Received for Laboratory by: (Signature)	8/7/14 0850	Temperature 1.2, 2.3

REMARKS:

Details:
Page ___ of ___
Cooler No ___ of ___
Date Shipped
Shipped By
Turnaround

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

1408041

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 ♦ Nashville, TN 37228 ♦ 615-345-1115 ♦ (fax) 615-846-5426

197115

Send Results to:	Send Invoice to:
Name Juliana Dean	Name Same
Company CH2M HILL	Company
Address 5701 Cleveland St Suite 200	Address
City Virginia Beach	City
State, Zip VA 23462	State, Zip
Phone 757-671-6232	Phone
Fax	Fax
E-mail juliana.dean@ch2m.com	E-mail
Project No./Name: 404422.FI.SW.56	Sampler's (Signature):

Analysis Requirements: Metals 6010C; PCB 8082A

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres.
11	08/05/14 1030	VWW06-SD027-2430-SD	SD	✓	✓		2	
12	08/05/14 1035	VWW06-SD027-4854	SD	✓	✓		2	
13	08/05/14 1040	VWW06-SD027-7278	SD	✓	✓		2	
14	08/05/14 1205	VWW06-SD026-0006	SD	✓	✓		2	
15	08/05/14 1210	VWW06-SD026-2430	SD	✓	✓		2	
16	08/05/14 1215	VWW06-SD026P-2430	SD	✓	✓		2	
17	08/05/14 1220	VWW06-SD026-4854	SD	✓	✓		2	
18	08/05/14 1225	VWW06-SD026-7278	SD	✓	✓		2	
19	08/05/14 1250	VWW06-SD025-0006	SD	✓	✓		2	
↓	08/05/14 1250	VWW06-SD025-0006-MS	SD	✓	✓		2	
↓	08/05/14 1250	VWW06-SD025-0006-SD	SD	✓	✓		2	
20	08/05/14 1255	VWW06-SD025-2430	SD	✓	✓		2	

Sample Kit Prep'd by: (Signature)	Date/Time	Received By: (Signature)
Relinquished by: (Signature)	Date/Time 8/6/14 1200	Received By: (Signature)
Relinquished by: (Signature)	Date/Time	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time 8/7/14 0850	Temperature 1.2, 2.3

REMARKS:

Details:

Page ____ of ____

Cooler No. ____ of ____

Date Shipped ____

Shipped By ____

Turnaround ____

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

1408041

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 • Nashville, TN 37228 • 615-345-1115 • (fax) 615-846-5426

19745

3 of 3

Send Results to:

Name Juliana Dean
Company CH2M HILL
Address 5701 Cleveland Str. Suite 200
City Virginia Beach
State, Zip VA 23462
Phone 757-671-6232
Fax
E-mail juliana.dean@ch2m.com

Send Invoice to:

Name Same
Company
Address
City
State, Zip
Phone
Fax
E-mail

Analysis Requirements:

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #:

CAR #:

Project No./Name: 404422-FI.SW.S6

Sampler's (Signature):

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	Metals 6010C	PCB 8082A	Comments	No. of Bottles	Lab Use Only Containers/Pres.
21	08/05/14 1300	VWW06-SD025-4854	SD	✓	✓		2	
22	08/05/14 1305	VWW06-SD025-7278	SD	✓	✓		2	
23	08/05/14 1325	VWW06-SD024-0006	SD	✓	✓		2	
24	08/05/14 1330	VWW06-SD024P-0006	SD	✓	✓		2	
25	08/05/14 1335	VWW06-SD024-2430	SD	✓	✓		2	
26	08/05/14 1340	VWW06-SD024-4854	SD	✓	✓		2	
JG 27 3	08/05/14 1345	VWW06-SD024-7278	SD	✓	✓		2	
28	8/6/14 1130	VWW06-EB01-080614	WI	✓	✓		3	

Sample Kit Prep'd by: (Signature)	Date/Time	Received By: (Signature)
Relinquished by: (Signature)	Date/Time 8/6/14 1200	Received By: (Signature)
Relinquished by: (Signature)	Date/Time	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time 8/7/14 0850	Temperature 1.2, 2.5

REMARKS:

Details:
Page ___ of ___
Cooler No. ___ of ___
Date Shipped
Shipped By
Turnaround

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 08/07/14 0850 Workorder# 1408041

1. Tracking # 9677 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: 1.5 °C - correction factor (-0.3) = 1.2 °C

3. If item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO (NA)

4. Were custody seals on outside of cooler? (YES) NO NA

   If yes, how many and where: 2, front + back

5. Were the seals intact, signed, and dated correctly? (YES) NO NA

6. Were custody papers inside cooler? (YES) NO NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) JTG 8/7/14

7. Were custody seals on containers: YES (NO) and intact YES NO (NA)

   Were these signed and dated correctly? YES NO (NA)

8. Packing material used? (Bubblewrap) (Plastic bag) Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: (Ice) Ice-pack Ice (direct contact) Dry Ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES) NO NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES) NO NA

12. Did all container labels and tags agree with custody papers? (YES) NO NA

13. a. Were VOA vials received? YES (NO) NA

    b. Was there any observable headspace present in any VOA vial? YES NO (NA)

14. Was there a Trip Blank in this cooler? YES (NO) NA If multiple coolers, sequence # 1

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) JTG 8/7/14

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? (YES) NO (NA) JTG

    b. Did the bottle labels indicate that the correct preservatives were used (YES) NO NA

16. Was residual chlorine present? YES NO (NA)

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) JTG 8/7/14

17. Were custody papers properly filled out (ink, signed, etc)? (YES) NO NA

18. Did you sign the custody papers in the appropriate place? (YES) NO NA

19. Were correct containers used for the analysis requested? (YES) NO NA

20. Was sufficient amount of sample sent in each container? (YES) NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial/date) JTG 8/7/14

I certify that I attached a label with the unique LIMS number to each container (initial/date) JTG 8/7/14

I certify that I have performed a second check of the LIMS information against the COC to confirm accuracy (initial/date)

21. Were there Non-Conformance issues at login? YES (NO) Was a NCR generated? YES (NO) #

Additional Details:

II. EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

Cooler Received/Opened On: 08/07/14 0850 Workorder# 1408041

1. Tracking # 7062 (last 4 digits, FedEx)

   Courier: FedEx

2. Temperature of rep. sample or temp blank when opened: 2.6 °C + *correction factor (-0.3)* = 2.3 °C

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO (NA)

4. Were custody seals on outside of cooler? (YES) NO NA

   If yes, how many and where: 2. front + back

5. Were the seals intact, signed, and dated correctly? (YES) NO NA

6. Were custody papers inside cooler? (YES) NO NA

I certify that I opened the cooler and answered questions 1-6 (initial/date) JTW 8/7/14

7. Were custody seals on containers: YES (NO) and intact. YES NO (NA)

   Were these signed and dated correctly? YES NO (NA)

8. Packing material used? (Bubblewrap) Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: (Ice) Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? (YES) NO NA

11. Were all container labels complete (#, date, signed, pres., etc)? (YES) NO NA

12. Did all container labels and tags agree with custody papers? (YES) NO NA

13. a. Were VOA vials received? YES (NO) NA

    b. Was there any observable headspace present in any VOA vial? YES NO (NA)

14. Was there a Trip Blank in this cooler? YES (NO) NA If multiple coolers, sequence # 2

I certify that I unloaded the cooler and answered questions 7-14 (initial/date) JTW 8/7/14

15. a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES NO (NA)

    b. Did the bottle labels indicate that the correct preservatives were used YES NO (NA)

16. Was residual chlorine present? YES NO (NA)

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial/date) JTW 8/7/14

17. Were custody papers properly filled out (ink, signed, etc)? (YES) NO NA

18. Did you sign the custody papers in the appropriate place? (YES) NO NA

19. Were correct containers used for the analysis requested? (YES) NO NA

20. Was sufficient amount of sample sent in each container? (YES) NO NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial/date) JTW 8/7/14

I certify that I attached a label with the unique LIMS number to each container (initial/date) JTW 8/7/14

I certify that I have performed a second check of the LIMS information against the COC to confirm accuracy (initial/date)

21. Were there Non-Conformance issues at login? YES (NO) Was a NCR generated? YES (NO) #

Additional Details:

Holding Times

Sampling Date: 8/5-8/6
Received Date: 8/7/14
Extraction Date: 8/8, 8/11, 8/19 & 8/29 – PCBs
Analysis Dates: 8/11-8/13, 8/18, 8/26-8/27 – PCBs

The samples in this SDG were validated according to the recommendations in the Region II SOP NO. HW-37 Rev 3, 5/2013 and the QC limits published in the project specific SAP.

Receipt paperwork was in order. Cooler temperatures were acceptable. A seven-day holding time was used for the water samples and a fourteen-day holding time was used for the soil samples. The analysis holding time of 40 days was used. Based on this, all extraction and analysis holding times were met with the exception of several samples that were re-extracted due to non-compliant surrogate recoveries. For this reason, samples VWW06-SD027-0006RE1, VWW06-SD025-0006 RE1, VWW06-SD024-0006RE1, and VWW06-SD024P-0006RE1, which were re-extracted 13 days outside the holding time, are excluded in favor of the results reported from the analyses reported from the initial extractions.

Several samples were re-extracted due to non-complaint surrogate recoveries. The laboratory did not report the original extraction results for these samples. An explanation was requested as to why the original extraction results were not reported also.

All samples exhibited percent solids values >30% so no qualifications were required.

Calibrations

8082 PCB: Initial calibrations were performed according to the method with a six-point curve for AR1016, AR1242, AR1254, & AR1260 as the representative PCBs. Response factors were calculated. %RSDs were within QC limits. All ICV criteria were met (avg. %Ds were met). Continuing calibration standards were analyzed appropriately (for 1016, 1242 & 1260). All CCVs exhibited acceptable %Ds (avg. %Ds were met) with the exception of the AR1260 %D on 2C for the standard analyzed 8/27/14 at 5:04. There were no samples associated with this calibration standard so no qualifications were required. Column resolution was acceptable. Standard retention times were stable throughout the analytical sequences. The correct analytical sequences were run. Raw data and calculations were verified.

Blank Summary

Blank qualification guidelines:

- No action is taken if a compound is found in the blank but not in the sample.
- Any compound detected in the sample, and the associated blank, must be qualified by reporting the result in the sample as non-detect at the LOD when the sample concentration is less than LOD.
- Sample weight, volume or dilution factor must be taken into consideration when applying the qualification criteria.
- Apply the same data validation guidelines to any associated rinse and field blanks and all associated samples.
- Qualification/Action codes:
  - No Action - The sample result is greater than the LOD and greater than five times (5X) the blank value.
  - U at LOD- The sample result is less than the LOD when the blank contamination level is less than the LOD.

Professional judgment is applied when blank concentrations are >LOD. Results may be flagged as U at the reported concentration or rejected. No contamination that resulted in qualification of the data was noted in the associated method or instrument blanks or the submitted field QC blanks.

Blank ID	Compound	Concentration	Action Level	Q Flag
no contamination was noted				

Surrogate Recoveries

Surrogate recoveries did not meet criteria in many of the samples in this SDG. Samples VWW06-SD028-4854, VWW06-SD026-4854, VWW06-SD024-7278, VWW06-SD033-0006, VWW06-SD027-0006, VWW06-SD025-0006, VWW06-SD024-0006, and VWW06-SD024P-2430 are qualified as estimated J-/UJ due to low surrogate recoveries.

Matrix Spike/Matrix Spike Duplicates

The MS/MSD samples analyzed for this SDG were acceptable for all recoveries and RPDs in the original runs. The re-extraction runs (performed due to non-compliant surrogate recoveries) were not all acceptable but no qualifications were required.

Laboratory Control Samples

The LCS samples exhibited acceptable recoveries and RPDs. No qualifications were required.

Field Duplicate Sample Summary

There were three field duplicate pairs in this SDG. No qualifications were necessary in one of the field duplicate pairs. See the worksheet following this page for details.

Sample Result Verification

Reported sample results were verified. Raw data and calculations were verified.

Reviewer: Jacqueline Cleveland Date: 10/28/14

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD028-2430
Duplicate Sample ID: VWW06-SD028P-2430

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: no positive results reported in either sample

Sample ID: VWW06-SD026-2430
Duplicate Sample ID: VWW06-SD026P-2430

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: no positive results reported in either sample

Sample ID: VWW06-SD024-0006
Duplicate Sample ID: VWW06-SD024P-0006

Soil: RPD>30%

Compound	Sample Conc.	Dup. Sample Conc.	%RPD
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!
			#DIV/0!

COMMENTS: no positive results reported in either sample

Initial Calibration Date: 7/24-25-14, Instrument GL-ECD3

RRF and %RSD Calculations:

Compound Name: Cal3 at 750/75, Std. 14G0434, AR1660 peak 2 in level 3
Lab Value: 2054.3000

Area of Compound	1540725
Conc. of Compound	750
Calculated CF	2054.300

Compound Name: AR1260 Peak 2
Lab Value: 6.4

CF of STD 1	1883.529
CF of STD 2	1962.644
CF of STD 3	2054.300
CF of STD 4	2133.612
CF of STD 5	2036.520
CF of STD 6	2259.440
CF of STD 7	
CF of STD 8	
Calculated % RSD	6.39

Continuing Calibration File ID: 8/11/14, @ 2058, FILE id 0461460l.d

RRF and %D Calculations:

Compound Name: AR1260, peak 1
Lab Value: 4389.0440

Area of Compound	4389044
Conc. of Compound	1000
Calculated CF	4389.044

Compound Name: AR1260, peak 1
Lab Value: 2.0

Average CF	4303.434
CF of CCV	4389.044
Calculated % D	-2.0

SAMPLE CALCULATION - SDG 1408016

Sample ID: VWW06-SD025-0006
Standard ID: ICAL 7/24-25/14
Compound: AR1242
Concentration: 30.4 ug/Kg (average of 3 peaks)
Calculation shows Peak 1: 11.97495ug/Kg

	Water (ug/L)	Soil (ug/Kg)
Area of Compound		21860
CF of Compound		766.2194
Final Volume		5
Dilution Factor		1
Split Factor		1
Injection Volume		1
Weight of Sample	na	15.2
Initial Volume of Sample		NA
Conversion Factor		1
Percent Solids Factor		0.7837
Concentration	#DIV/0!	11.97495

Peak #	Concentration
1	11.974
2	33.6
3	7.425
4	
5	67.9133
Total	**30.228075**

CONTINUING CALIBRATION CHECK

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Instrument ID:	GC-ECD3	Calibration:	4232001
Lab File ID:	072F7201.D	Calibration Date:	08/18/14 00:00
Sequence:	4H23912	Injection Date:	08/27/14
Lab Sample ID:	4H23912-CCV1	Injection Time:	05:04

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT		
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
Aroclor-1016 (1)	A	1000	1136	2113.843	2401.896		13.6	20	
Aroclor-1016 (2)	A	1000	1006	734.3489	739.072		0.6	20	
Aroclor-1016 (3)	A	1000	1074	804.0584	863.295		7.4	20	
Aroclor-1016 (4)	A	1000	1030	942.6706	971.124		3.0	20	
Aroclor-1016 (5)	A	1000	1081	892.6094	965.174		8.1	20	
Aroclor-1016 (1) [2C]	A	1000	1153	891.5959	1027.873		15.3	20	
Aroclor-1016 (2) [2C]	A	1000	1099	479.3189	526.96		9.9	20	
Aroclor-1016 (3) [2C]	A	1000	1134	696.9597	790.025		13.4	20	
Aroclor-1016 (4) [2C]	A	1000	1133	381.4449	432.163		13.3	20	
Aroclor-1016 (5) [2C]	A	1000	1168	410.0374	479.038		16.8	20	
Aroclor-1260 (1)	A	1000	1127	4406.541	4965.87		12.7	20	
Aroclor-1260 (2)	A	1000	1081	2044.193	2209.02		8.1	20	
Aroclor-1260 (3)	A	1000	1090	2512.111	2739.234		9.0	20	
Aroclor-1260 (4)	A	1000	1108	1838.649	2037.26		10.8	20	
Aroclor-1260 (5)	A	1000	1111	1104.49	1227.553		11.1	20	
Aroclor-1260 (1) [2C]	A	1000	1260	1857.154	2340.063		26.0	20	*
Aroclor-1260 (2) [2C]	A	1000	1203	922.5893	1109.544		20.3	20	*
Aroclor-1260 (3) [2C]	A	1000	1233	1110.654	1369.149		23.3	20	*
Aroclor-1260 (4) [2C]	A	1000	1233	1225.317	1511.154		23.3	20	*
Aroclor-1260 (5) [2C]	A	1000	1236	847.6097	1047.759		23.6	20	*
Tetrachloro-m-xylene	A	100.0	107.5	45199.6	48591.74		7.5	20	
Tetrachloro-m-xylene [2C]	A	100.0	108.9	19963.08	21747.77		8.9	20	
Decachlorobiphenyl	A	100.0	106.6	34018.41	36264.65		6.6	20	
Decachlorobiphenyl [2C]	A	100.0	110.4	15208.67	16784.3		10.4	20	

NG

AVG. 23.3 - no samples associated

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H22602	Instrument:	GL-ECD3
		Calibration:	4209006

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (4H22602-CCV1) ug/L				Lab File ID: 003F0301.D		Analyzed: 08/12/14 13:56		
Tetrachloro-m-xylene	100.0	89.7	80 - 120	2.372	2.372	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	91.4	80 - 120	2.824	2.824	0.0000	+/-0.030	
Decachlorobiphenyl	100.0	86.8	80 - 120	7.109	7.109	0.0000	+/-0.030	
Decachlorobiphenyl [2C]	100.0	87.3	80 - 120	7.869	7.869	0.0000	+/-0.030	
Calibration Check (4H22602-CCVF) ug/L				Lab File ID: 051F5101.D		Analyzed: 08/13/14 00:53		
Tetrachloro-m-xylene	100.0	86.3	80 - 120	2.374	2.372	0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	90.6	80 - 120	2.824	2.824	0.0000	+/-0.030	
Decachlorobiphenyl	100.0	94.5	80 - 120	7.107	7.109	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	100.0	95.8	80 - 120	7.867	7.869	-0.0020	+/-0.030	
VWW06-SD033-4854 (1408041-03) ug/Kg dry				Lab File ID: 052F5201.D		Analyzed: 08/13/14 01:06		
Tetrachloro-m-xylene	24.84	69.1	70 - 125	2.372	2.372	0.0000	+/-0.030	*
Tetrachloro-m-xylene [2C]	24.84	74.7	70 - 125	2.824	2.824	0.0000	+/-0.030	
Decachlorobiphenyl	24.84	71.9	60 - 125	7.107	7.109	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	24.84	73.6	60 - 125	7.867	7.869	-0.0020	+/-0.030	
VWW06-SD033-7278 (1408041-04) ug/Kg dry				Lab File ID: 053F5301.D		Analyzed: 08/13/14 01:20		
Tetrachloro-m-xylene	22.75	76.5	70 - 125	2.373	2.372	0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	22.75	82.2	70 - 125	2.823	2.824	-0.0010	+/-0.030	
Decachlorobiphenyl	22.75	80.0	60 - 125	7.106	7.109	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	22.75	82.0	60 - 125	7.867	7.869	-0.0020	+/-0.030	
VWW06-SD028-4854 (1408041-08) ug/Kg dry				Lab File ID: 057F5701.D		Analyzed: 08/13/14 02:15		
Tetrachloro-m-xylene	23.84	61.3	70 - 125	2.373	2.372	0.0010	+/-0.030	*
Tetrachloro-m-xylene [2C]	23.84	65.9	70 - 125	2.823	2.824	-0.0010	+/-0.030	*
Decachlorobiphenyl	23.84	60.7	60 - 125	7.106	7.109	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	23.84	62.0	60 - 125	7.866	7.869	-0.0030	+/-0.030	
VWW06-SD028-7278 (1408041-09) ug/Kg dry				Lab File ID: 058F5801.D		Analyzed: 08/13/14 02:28		
Tetrachloro-m-xylene	22.17	72.7	70 - 125	2.373	2.372	0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	22.17	78.7	70 - 125	2.823	2.824	-0.0010	+/-0.030	
Decachlorobiphenyl	22.17	80.1	60 - 125	7.106	7.109	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	22.17	81.9	60 - 125	7.868	7.869	-0.0010	+/-0.030	
VWW06-SD027-4854 (1408041-12) ug/Kg dry				Lab File ID: 063F6301.D		Analyzed: 08/13/14 03:37		
Tetrachloro-m-xylene	26.43	67.8	70 - 125	2.372	2.372	0.0000	+/-0.030	*
Tetrachloro-m-xylene [2C]	26.43	72.6	70 - 125	2.824	2.824	0.0000	+/-0.030	
Decachlorobiphenyl	26.43	73.7	60 - 125	7.105	7.109	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	26.43	75.2	60 - 125	7.867	7.869	-0.0020	+/-0.030	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H22602	Instrument:	GL-ECD3
		Calibration:	4209006

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (4H22602-CCV1) ug/L				Lab File ID: 066F6601.D		Analyzed: 08/13/14 04:18		
Tetrachloro-m-xylene	100.0	93.0	80 - 120	2.373	2.372	0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	97.9	80 - 120	2.824	2.824	0.0000	+/-0.030	
Decachlorobiphenyl	100.0	95.7	80 - 120	7.107	7.109	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	100.0	97.1	80 - 120	7.867	7.869	-0.0020	+/-0.030	
VWW06-SD027-7278 (1408041-13) ug/Kg dry				Lab File ID: 067F6701.D		Analyzed: 08/13/14 04:32		
Tetrachloro-m-xylene	23.38	75.0	70 - 125	2.371	2.372	-0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	23.38	81.1	70 - 125	2.823	2.824	-0.0010	+/-0.030	
Decachlorobiphenyl	23.38	63.4	60 - 125	7.105	7.109	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	23.38	65.5	60 - 125	7.867	7.869	-0.0020	+/-0.030	
VWW06-SD026-4854 (1408041-17) ug/Kg dry				Lab File ID: 071F7101.D		Analyzed: 08/13/14 05:27		
Tetrachloro-m-xylene	26.56	67.7	70 - 125	2.372	2.372	0.0000	+/-0.030	*
Tetrachloro-m-xylene [2C]	26.56	73.7	70 - 125	2.824	2.824	0.0000	+/-0.030	
Decachlorobiphenyl	26.56	59.5	60 - 125	7.106	7.109	-0.0030	+/-0.030	*
Decachlorobiphenyl [2C]	26.56	60.4	60 - 125	7.866	7.869	-0.0030	+/-0.030	
VWW06-SD026-7278 (1408041-18) ug/Kg dry				Lab File ID: 072F7201.D		Analyzed: 08/13/14 05:40		
Tetrachloro-m-xylene	27.10	68.7	70 - 125	2.372	2.372	0.0000	+/-0.030	*
Tetrachloro-m-xylene [2C]	27.10	75.9	70 - 125	2.824	2.824	0.0000	+/-0.030	
Decachlorobiphenyl	27.10	67.8	60 - 125	7.105	7.109	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	27.10	68.8	60 - 125	7.866	7.869	-0.0030	+/-0.030	
VWW06-SD025-4854 (1408041-21) ug/Kg dry				Lab File ID: 079F7901.D		Analyzed: 08/13/14 07:16		
Tetrachloro-m-xylene	28.35	66.5	70 - 125	2.373	2.372	0.0010	+/-0.030	*
Tetrachloro-m-xylene [2C]	28.35	71.4	70 - 125	2.823	2.824	-0.0010	+/-0.030	
Decachlorobiphenyl	28.35	69.5	60 - 125	7.106	7.109	-0.0030	+/-0.030	
Decachlorobiphenyl [2C]	28.35	70.3	60 - 125	7.866	7.869	-0.0030	+/-0.030	
VWW06-SD025-7278 (1408041-22) ug/Kg dry				Lab File ID: 080F8001.D		Analyzed: 08/13/14 07:30		
Tetrachloro-m-xylene	21.96	75.4	70 - 125	2.372	2.372	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	21.96	81.4	70 - 125	2.823	2.824	-0.0010	+/-0.030	
Decachlorobiphenyl	21.96	81.2	60 - 125	7.107	7.109	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	21.96	81.9	60 - 125	7.866	7.869	-0.0030	+/-0.030	
Calibration Check (4H22602-CCVL) ug/L				Lab File ID: 083F8301.D		Analyzed: 08/13/14 08:11		
Tetrachloro-m-xylene	100.0	95.5	80 - 120	2.372	2.372	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	101	80 - 120	2.824	2.824	0.0000	+/-0.030	
Decachlorobiphenyl	100.0	98.4	80 - 120	7.105	7.109	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	100.0	99.8	80 - 120	7.865	7.869	-0.0040	+/-0.030	

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SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H22602	Instrument:	GL-ECD3
		Calibration:	4209006

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
VWW06-SD024-4854 (1408041-26) ug/Kg dry				Lab File ID: 089F8901.D		Analyzed: 08/13/14 09:33		
Tetrachloro-m-xylene	23.39	72.3	70 - 125	2.373	2.372	0.0010	+/-0.030	
Tetrachloro-m-xylene [2C]	23.39	77.7	70 - 125	2.823	2.824	-0.0010	+/-0.030	
Decachlorobiphenyl	23.39	74.2	60 - 125	7.104	7.109	-0.0050	+/-0.030	
Decachlorobiphenyl [2C]	23.39	75.9	60 - 125	7.864	7.869	-0.0050	+/-0.030	
VWW06-SD024-7278 (1408041-27) ug/Kg dry				Lab File ID: 090F9001.D		Analyzed: 08/13/14 09:47		
Tetrachloro-m-xylene	24.05	70.2	70 - 125	2.372	2.372	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	24.05	73.6	70 - 125	2.823	2.824	-0.0010	+/-0.030	
Decachlorobiphenyl	24.05	40.3	60 - 125	7.106	7.109	-0.0030	+/-0.030	*
Decachlorobiphenyl [2C]	24.05	41.6	60 - 125	7.864	7.869	-0.0050	+/-0.030	*
Calibration Check (4H22602-CCVO) ug/L				Lab File ID: 093F9301.D		Analyzed: 08/13/14 10:28		
Tetrachloro-m-xylene	100.0	98.1	80 - 120	2.372	2.372	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	104	80 - 120	2.824	2.824	0.0000	+/-0.030	
Decachlorobiphenyl	100.0	98.1	80 - 120	7.105	7.109	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	100.0	99.7	80 - 120	7.865	7.869	-0.0040	+/-0.030	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H23912	Instrument:	GL-ECD3
		Calibration:	4232001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Blank (4H08021-BLK1) ug/Kg wet				Lab File ID: 054F5401.D		Analyzed: 08/27/14 00:42		
Tetrachloro-m-xylene	16.67	91.5	70 - 125	2.811	2.814	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	16.67	94.2	70 - 125	3.278	3.281	-0.0030	+/-0.030	
Decachlorobiphenyl	16.67	101	60 - 125	7.583	7.584	-0.0010	+/-0.030	
Decachlorobiphenyl [2C]	16.67	107	60 - 125	8.33	8.33	0.0000	+/-0.030	
LCS (4H08021-BS1) ug/Kg wet				Lab File ID: 055F5501.D		Analyzed: 08/27/14 00:56		
Tetrachloro-m-xylene	16.67	84.7	70 - 125	2.811	2.814	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	16.67	87.4	70 - 125	3.278	3.281	-0.0030	+/-0.030	
Decachlorobiphenyl	16.67	89.3	60 - 125	7.583	7.584	-0.0010	+/-0.030	
Decachlorobiphenyl [2C]	16.67	95.0	60 - 125	8.328	8.33	-0.0020	+/-0.030	
VWW06-SD033-0006 (1408041-01) ug/Kg dry				Lab File ID: 056F5601.D		Analyzed: 08/27/14 01:11		
Tetrachloro-m-xylene	31.86	64.9	70 - 125	2.811	2.814	-0.0030	+/-0.030	*
Tetrachloro-m-xylene [2C]	31.86	67.1	70 - 125	3.278	3.281	-0.0030	+/-0.030	*
Decachlorobiphenyl	31.86	65.2	60 - 125	7.583	7.584	-0.0010	+/-0.030	
Decachlorobiphenyl [2C]	31.86	71.2	60 - 125	8.328	8.33	-0.0020	+/-0.030	
VWW06-SD028-0006 (1408041-05) ug/Kg dry				Lab File ID: 057F5701.D		Analyzed: 08/27/14 01:26		
Tetrachloro-m-xylene	27.16	68.8	70 - 125	2.811	2.814	-0.0030	+/-0.030	*
Tetrachloro-m-xylene [2C]	27.16	71.0	70 - 125	3.278	3.281	-0.0030	+/-0.030	
Decachlorobiphenyl	27.16	69.4	60 - 125	7.582	7.584	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	27.16	76.4	60 - 125	8.329	8.33	-0.0010	+/-0.030	
VWW06-SD027-0006 (1408041-10) ug/Kg dry				Lab File ID: 058F5801.D		Analyzed: 08/27/14 01:40		
Tetrachloro-m-xylene	25.31	53.1	70 - 125	2.811	2.814	-0.0030	+/-0.030	*
Tetrachloro-m-xylene [2C]	25.31	54.6	70 - 125	3.278	3.281	-0.0030	+/-0.030	*
Decachlorobiphenyl	25.31	46.0	60 - 125	7.584	7.584	0.0000	+/-0.030	*
Decachlorobiphenyl [2C]	25.31	52.5	60 - 125	8.328	8.33	-0.0020	+/-0.030	*
VWW06-SD026-0006 (1408041-14) ug/Kg dry				Lab File ID: 059F5901.D		Analyzed: 08/27/14 01:55		
Tetrachloro-m-xylene	22.20	73.4	70 - 125	2.811	2.814	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	22.20	74.8	70 - 125	3.278	3.281	-0.0030	+/-0.030	
Decachlorobiphenyl	22.20	75.8	60 - 125	7.584	7.584	0.0000	+/-0.030	
Decachlorobiphenyl [2C]	22.20	82.8	60 - 125	8.329	8.33	-0.0010	+/-0.030	
VWW06-SD025-0006 (1408041-19) ug/Kg dry				Lab File ID: 060F6001.D		Analyzed: 08/27/14 02:09		
Tetrachloro-m-xylene	20.73	58.2	70 - 125	2.811	2.814	-0.0030	+/-0.030	*
Tetrachloro-m-xylene [2C]	20.73	60.1	70 - 125	3.278	3.281	-0.0030	+/-0.030	*
Decachlorobiphenyl	20.73	42.3	60 - 125	7.583	7.584	-0.0010	+/-0.030	*
Decachlorobiphenyl [2C]	20.73	47.0	60 - 125	8.329	8.33	-0.0010	+/-0.030	*

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H23912	Instrument:	GL-ECD3
		Calibration:	4232001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Matrix Spike (4H08021-MS2) ug/Kg dry				Lab File ID: 061F6101.D		Analyzed: 08/27/14 02:24		
Tetrachloro-m-xylene	20.80	63.5	70 - 125	2.811	2.814	-0.0030	+/-0.030	*
Tetrachloro-m-xylene [2C]	20.80	65.7	70 - 125	3.277	3.281	-0.0040	+/-0.030	*
Decachlorobiphenyl	20.80	63.8	60 - 125	7.584	7.584	0.0000	+/-0.030	
Decachlorobiphenyl [2C]	20.80	71.1	60 - 125	8.329	8.33	-0.0010	+/-0.030	
Matrix Spike Dup (4H08021-MSD2) ug/Kg dry				Lab File ID: 062F6201.D		Analyzed: 08/27/14 02:39		
Tetrachloro-m-xylene	21.15	74.1	70 - 125	2.812	2.814	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	21.15	76.3	70 - 125	3.279	3.281	-0.0020	+/-0.030	
Decachlorobiphenyl	21.15	67.6	60 - 125	7.583	7.584	-0.0010	+/-0.030	
Decachlorobiphenyl [2C]	21.15	76.3	60 - 125	8.329	8.33	-0.0010	+/-0.030	
Blank (4H08023-BLK1) ug/Kg wet				Lab File ID: 063F6301.D		Analyzed: 08/27/14 02:53		
Tetrachloro-m-xylene	16.67	80.6	70 - 125	2.812	2.814	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	16.67	83.2	70 - 125	3.279	3.281	-0.0020	+/-0.030	
Decachlorobiphenyl	16.67	92.1	60 - 125	7.582	7.584	-0.0020	+/-0.030	
Decachlorobiphenyl [2C]	16.67	99.7	60 - 125	8.327	8.33	-0.0030	+/-0.030	
LCS (4H08023-BS1) ug/Kg wet				Lab File ID: 064F6401.D		Analyzed: 08/27/14 03:08		
Tetrachloro-m-xylene	16.67	82.6	70 - 125	2.81	2.814	-0.0040	+/-0.030	
Tetrachloro-m-xylene [2C]	16.67	85.2	70 - 125	3.277	3.281	-0.0040	+/-0.030	
Decachlorobiphenyl	16.67	85.5	60 - 125	7.583	7.584	-0.0010	+/-0.030	
Decachlorobiphenyl [2C]	16.67	91.1	60 - 125	8.328	8.33	-0.0020	+/-0.030	
VWW06-SD024-0006 (1408041-23) ug/Kg dry				Lab File ID: 065F6501.D		Analyzed: 08/27/14 03:22		
Tetrachloro-m-xylene	29.66	59.7	70 - 125	2.81	2.814	-0.0040	+/-0.030	*
Tetrachloro-m-xylene [2C]	29.66	64.0	70 - 125	3.278	3.281	-0.0030	+/-0.030	*
Decachlorobiphenyl	29.66	53.3	60 - 125	7.583	7.584	-0.0010	+/-0.030	*
Decachlorobiphenyl [2C]	29.66	60.2	60 - 125	8.328	8.33	-0.0020	+/-0.030	OK
Matrix Spike (4H08023-MS1) ug/Kg dry				Lab File ID: 066F6601.D		Analyzed: 08/27/14 03:37		
Tetrachloro-m-xylene	29.74	66.1	70 - 125	2.811	2.814	-0.0030	+/-0.030	*
Tetrachloro-m-xylene [2C]	29.74	69.6	70 - 125	3.278	3.281	-0.0030	+/-0.030	*
Decachlorobiphenyl	29.74	27.3	60 - 125	7.583	7.584	-0.0010	+/-0.030	*
Decachlorobiphenyl [2C]	29.74	29.8	60 - 125	8.328	8.33	-0.0020	+/-0.030	*
Matrix Spike Dup (4H08023-MSD1) ug/Kg dry				Lab File ID: 067F6701.D		Analyzed: 08/27/14 03:51		
Tetrachloro-m-xylene	29.82	62.1	70 - 125	2.81	2.814	-0.0040	+/-0.030	*
Tetrachloro-m-xylene [2C]	29.82	64.4	70 - 125	3.277	3.281	-0.0040	+/-0.030	*
Decachlorobiphenyl	29.82	50.8	60 - 125	7.583	7.584	-0.0010	+/-0.030	*
Decachlorobiphenyl [2C]	29.82	55.1	60 - 125	8.328	8.33	-0.0020	+/-0.030	*

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4H23912	Instrument:	GL-ECD3
		Calibration:	4232001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
VWW06-SD024P-0006 (1408041-24) ug/Kg dry				Lab File ID: 068F6801.D		Analyzed: 08/27/14 04:06		
Tetrachloro-m-xylene	28.80	65.3	70 - 125	2.811	2.814	-0.0030	+/-0.030	*
Tetrachloro-m-xylene [2C]	28.80	68.3	70 - 125	3.278	3.281	-0.0030	+/-0.030	*
Decachlorobiphenyl	28.80	53.6	60 - 125	7.583	7.584	-0.0010	+/-0.030	*
Decachlorobiphenyl [2C]	28.80	59.4	60 - 125	8.328	8.33	-0.0020	+/-0.030	*
VWW06-SD024-2430 (1408041-25) ug/Kg dry				Lab File ID: 069F6901.D		Analyzed: 08/27/14 04:21		
Tetrachloro-m-xylene	32.22	71.4	70 - 125	2.811	2.814	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	32.22	74.0	70 - 125	3.278	3.281	-0.0030	+/-0.030	
Decachlorobiphenyl	32.22	51.6	60 - 125	7.583	7.584	-0.0010	+/-0.030	*
Decachlorobiphenyl [2C]	32.22	55.9	60 - 125	8.328	8.33	-0.0020	+/-0.030	*
Calibration Check (4H23912-CCV1) ug/L				Lab File ID: 072F7201.D		Analyzed: 08/27/14 05:04		
Tetrachloro-m-xylene	100.0	108	80 - 120	2.812	2.814	-0.0020	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	109	80 - 120	3.279	3.281	-0.0020	+/-0.030	
Decachlorobiphenyl	100.0	107	80 - 120	7.583	7.584	-0.0010	+/-0.030	
Decachlorobiphenyl [2C]	100.0	110	80 - 120	8.329	8.33	-0.0010	+/-0.030	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

SW8082A

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Sequence:	4I25101	Instrument:	GL-ECD3
		Calibration:	4232001

Surrogate Compound	Spike Level	% Recovery	Recovery Limits	RT	CCV RT	RT Diff	RT Diff Limit	Q
Calibration Check (4I25101-CCVG) ug/L				Lab File ID: 066F6601.D		Analyzed: 09/05/14 04:56		
Tetrachloro-m-xylene	100.0	97.6	80 - 120	3.151	3.155	-0.0040	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	101	80 - 120	3.673	3.675	-0.0020	+/-0.030	
Decachlorobiphenyl	100.0	90.5	80 - 120	8.118	8.119	-0.0010	+/-0.030	
Decachlorobiphenyl [2C]	100.0	99.8	80 - 120	9.031	9.03	0.0010	+/-0.030	
VWW06-SD024-0006 (1408041-23RE1) ug/Kg dry				Lab File ID: 071F7101.D		Analyzed: 09/05/14 06:09		
Tetrachloro-m-xylene	29.33	88.9	70 - 125	3.152	3.155	-0.0030	+/-0.030	
Tetrachloro-m-xylene [2C]	29.33	89.0	70 - 125	3.67	3.675	-0.0050	+/-0.030	
Decachlorobiphenyl	29.33	70.0	60 - 125	8.115	8.119	-0.0040	+/-0.030	
Decachlorobiphenyl [2C]	29.33	79.7	60 - 125	9.03	9.03	0.0000	+/-0.030	
VWW06-SD024P-0006 (1408041-24RE1) ug/Kg dry				Lab File ID: 072F7201.D		Analyzed: 09/05/14 06:23		
Tetrachloro-m-xylene	28.43	83.1	70 - 125	3.15	3.155	-0.0050	+/-0.030	
Tetrachloro-m-xylene [2C]	28.43	85.4	70 - 125	3.67	3.675	-0.0050	+/-0.030	
Decachlorobiphenyl	28.43	72.9	60 - 125	8.113	8.119	-0.0060	+/-0.030	
Decachlorobiphenyl [2C]	28.43	83.0	60 - 125	9.028	9.03	-0.0020	+/-0.030	
VWW06-SD027-0006 (1408041-10RE1) ug/Kg dry				Lab File ID: 077F7701.D		Analyzed: 09/05/14 14:29		
Tetrachloro-m-xylene	25.27	90.2	70 - 125	3.192	3.155	0.0370	+/-0.030	*
Tetrachloro-m-xylene [2C]	25.27	93.7	70 - 125	3.712	3.675	0.0370	+/-0.030	*
Decachlorobiphenyl	25.27	81.9	60 - 125	8.142	8.119	0.0230	+/-0.030	
Decachlorobiphenyl [2C]	25.27	95.9	60 - 125	9.046	9.03	0.0160	+/-0.030	
Calibration Check (4I25101-CCVQ) ug/L				Lab File ID: 080F8001.D		Analyzed: 09/05/14 15:12		
Tetrachloro-m-xylene	100.0	101	80 - 120	3.155	3.155	0.0000	+/-0.030	
Tetrachloro-m-xylene [2C]	100.0	107	80 - 120	3.677	3.675	0.0020	+/-0.030	
Decachlorobiphenyl	100.0	94.9	80 - 120	8.119	8.119	0.0000	+/-0.030	
Decachlorobiphenyl [2C]	100.0	107	80 - 120	9.03	9.03	0.0000	+/-0.030	

* chromatogram was checked for potential impact based on RT shift

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8082A

VWW06-SD025-0006

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid		
Batch:	4H29007		
% Solids:	78.37		

Source Sample Name: 1408041-19RE1

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.	
Aroclor-1254	418.1	ND	230.6	55.2		50 - 150	
Aroclor-1254 [2C]	418.1	ND	201.7	48.2	*	50 - 150	NQ

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.	
Aroclor-1254	412.4	338.2	82.0	37.9	*	30	50 - 150	NQ
Aroclor-1254 [2C]	412.4	502.1	122	85.4	*	30	50 - 150	

Recoveries & RPD OK in original run.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW8082A

VWW06-SD027-2430

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project:	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid		
Batch:	4H18026		
% Solids:	37.51		

Source Sample Name: 1408041-11RE1

ANALYTE	SPIKE ADDED (ug/Kg dry)	SAMPLE CONCENTRATION (ug/Kg dry)	MS CONCENTRATION (ug/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Aroclor-1016	439.8	ND	275.8	62.7		40 - 140
Aroclor-1016 [2C]	439.8	ND	287.4	65.3		40 - 140
Aroclor-1260	438.4	ND	210.2	47.9	*	60 - 130
Aroclor-1260 [2C]	438.4	ND	264.1	60.2		60 - 130

NA

ANALYTE	SPIKE ADDED (ug/Kg dry)	MSD CONCENTRATION (ug/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Aroclor-1016	443.6	333.2	75.1	18.9		30	40 - 140
Aroclor-1016 [2C]	443.6	331.2	74.7	14.2		30	40 - 140
Aroclor-1260	442.2	248.3	56.2	16.7	*	30	60 - 130
Aroclor-1260 [2C]	442.2	312.9	70.8	16.9		30	60 - 130

NA

No Qualifications - Recoveries were OK in the original runs

This SDG contains 28 solid matrix samples and 1 QC blank samples analyzed for select metals using SW-846 methods 6010C. Region II validation guidelines were applied (updated 12/20/12) and these worksheets are submitted along with marked up pages from the data package and annotated form 1s and EDD files.

HOLDING TIMES

Sampling Date: 8/5-8/6
Received Date: 8/7/14
Prep. Dates: 8/11, 8/28, 8/29
Analysis Dates: 8/18, 9/2

All preparation & analysis holding time requirements were met. Cooler temps were acceptable and receipt paperwork was in order. One sample exhibited a %solids value <50%. All results in sample VW006-SD027-2430 (37.5%) are flagged as estimated J/UJ.

CALIBRATIONS

All initial calibration criteria were met for the methods noted above. All ICV, CCV and low calibration standard criteria were met or associated samples were reanalyzed against acceptable QC standards. PQL standard criteria were met. ICSA/ICSAB results were within method criteria for all analytes. Raw data was verified.

BLANK SUMMARY

Blank qualification guidelines:

- No action is taken if an analyte is found in the blank but not in the sample.
- Sample weight, volume or dilution factor must be taken into consideration when applying the criteria.
- See blank type specific validation guidelines noted below (taken from the Region II SOP for CLP metals and adapted to this project).
- Qualification/Action codes:

Note: non-detect results are reported to the LOD so the LOD is the RL for this project.

ICB/CCB/PB Action:

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL, result is reported as non-detect at the reporting limit, when the ICB/CCB/PB result is less than the RL.
R -	Sample result is greater than the RL and less than the ICB/CCB/PB value when the ICB/CCB/PB value is greater than the RL.
J -	Sample result is greater than the ICB/CCB/PB value but less than 10X the ICB/CCB/PB value when ICB/CCB/PB value is greater than the RL.
J/UJ -	Sample result is less than 10X RL when blank result is below the negative RL.

Field QC Blank action:

Note – Use field blanks to qualify data only if field blank results are greater than prep blank results.
Do not use rinsate blank associated with soils to qualify water samples and vice versa.

No Action -	The sample result is greater than the RL and greater than ten times (10X) the blank value.
U -	The sample result is greater than or equal to the MDL but less than or equal to the RL when the field blank result is greater than the RL - result is reported as non-detect at the reporting limit.
R -	Sample result is greater than the RL and less than the field blank value when the field blank result is greater than the RL.
J -	Sample result is greater than the field blank value but less than 10X the field blank value when field blank result is greater than the RL.

Blank Contamination and Qualification Summaries

Blank ID	Analyte	Concentration	Action Level	Q Flag
no contamination was noted in the associated blanks				

See validation report for specific samples and qualifications. Only those analytes requiring action are listed here. Negative contamination in a prep blank or CCB, if less than the analyte CRDL, is qualified based on professional judgement. Field QC blank associations are determined using tracking provided by the client. Flags are applied to samples based on these associations. **The concentration noted for the CCBs is the highest concentration in all the**

associated CCBs. However, when qualifying samples for CCB contamination, associated samples are those just prior to or just following a CCB. Therefore, not all analytes in all samples are flagged for CCB contamination.

MATRIX SPIKE/DUPLICATE SUMMARY

Qualifications were made based on the 12/12 revision of the Region II guidance SOPs which flags only the native sample for spike and spike dup recovery and RPD issues. The submitted PDS spikes were also considered in the evaluation of the spike data.

The MS/MSD pairs of samples VWW06-SD025-0006 exhibited acceptable recoveries that were out due to abundance. All other spike recoveries and RPDs were acceptable. All associated LCS recoveries were acceptable also. No qualifications were required

SERIAL DILUTIONS

The laboratory submitted acceptable serial dilution analyses. No qualifications were required.

SAMPLE RESULT VERIFICATION

Specific Comments:

All sample results were reported within the calibration/linear range of the instruments. Dilutions were performed. The raw data and calculations were verified. Field duplicates were assessed – see the following page for results and qualifications if needed.

Reviewer Jacqueline Cleveland **Date:** 10/28/14

FIELD DUPLICATE SAMPLE SUMMARY

Sample ID: VWW06-SD028-2430
Duplicate Sample ID: VWW06-SD028P-2430

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	4.11	4.15	1
zinc	7.89	8.13	3

COMMENTS: No qualifications were required
*30% RPD limit for all analytes >5X LOD - results in both samples flagged J

Sample ID: VWW06-SD026-2430
Duplicate Sample ID: VWW06-SD026P-2430

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD	
lead	22.7	14.8	42	*
zinc	47.7	104	74	*

COMMENTS: Flag both analytes as estimated J in the field duplicate pair
*30% RPD limit for all analytes >5X LOD - results in both samples flagged J

Sample ID: VWW06-SD024-0006
Duplicate Sample ID: VWW06-SD024P-0006

Analyte	Sample Conc.	Dup. Sample Conc.	%RPD
lead	160	194	19
zinc	200	226	12

COMMENTS: No qualifications were required
*30% RPD limit for all analytes >5X LOD - results in both samples flagged J

CH2MHILL VIEQUES SWMU6 CTO-113

SDG 1408041

Reporting Limit Calcs

ICP - AES	
SAMPLE ID	VWW06-SD033-0006
ANALYTE	zinc
Form 1 LOD or LOQ Value (mg/Kg)	7.43
Analyte LOD or LOQ	2
SAMPLE SIZE (g)	1.05
DILUTION FACTOR	2
DRYNESS FACTOR	0.5129
Corrected LOD or LOQ (mg/Kg)	7.427

CH2M HILL VIEQUES CTO-113

METALS CALCULATIONS

SDG 1408041

ICP - AES	
SAMPLE ID	VWW06-SD028-4854
ANALYTE	zinc
Lab Value CONCENTRATION (ug/Kg)	4.42
AMOUNT FROM RAW DATA (ug/L)	7.2067
SAMPLE SIZE (g)	0.96
FINAL VOLUME (L)	0.2
DILUTION FACTOR	2
DRYNESS FACTOR	0.6788
CONVERSION FACTOR (g TO Kg)	1
CALCULATED CONCENTRATION (ug/Kg)	4.42

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

SW6010C

VWW06-SD025-0006

Laboratory:	Empirical Laboratories, LLC	SDG:	1408041
Client:	CH2M Hill, Inc.	Project	NTR Vieques CTO 113 SWMU 6
Matrix:	Solid		
Batch:	4H26025		
% Solids:	78.37		

Source Sample Name: 1408041-19

ANALYTE	SPIKE ADDED (mg/Kg dry)	SAMPLE CONCENTRATION (mg/Kg dry)	MS CONCENTRATION (mg/Kg dry)	MS % REC.	Q	QC LIMITS REC.
Lead	65.10	300.1	486.1	286	4x	80 - 120
Zinc	130.2	509.4	848.7	261	N	80 - 120

ANALYTE	SPIKE ADDED (mg/Kg dry)	MSD CONCENTRATION (mg/Kg dry)	MSD % REC. #	% RPD	Q	QC LIMITS RPD	QC LIMITS REC.
Lead	62.55	444.2	230	9.00	4x	20	80 - 120
Zinc	125.1	797.9	231	6.18	4x	20	80 - 120

No Quals - out due to abundance

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Appendix E
Data Quality Evaluation

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Acronyms and Abbreviations

DoD	Department of Defense
DQE	Data Quality Evaluation
DQO	data quality objective
EPA	Environmental Protection Agency
LCS	laboratory control sample
LOD	limit of detection
LOQ	limit of quantitation
mg/kg	milligrams per kilogram
MS	matrix spike
MSD	matrix spike duplicate
PCB	polychlorinated biphenyls
PRG	Project Remediation Goal
QC	quality control
SAP	Sampling and Analysis Plan
SL	screening level
SOP	Standard Operating Procedure
SSL	soil screening level
SWMU	Solid Waste Management Unit
TCE	trichloroethene
UFP	Uniform Federal Policy
ug/kg	microgram/kilogram

SECTION 1

Data Quality Assessment

This Data Quality Evaluation (DQE) assesses the effect of the overall analytical process on the “availability” of the analytical data. “Availability” in this context refers to whether results can be used by the project team based on their analytical soundness. If a result is analytically sound, it is available for use for evaluating the potential releases, nature and extent of contamination, and estimating potentially associated human health and ecological risks. However, a particular result or group of results may not be “usable” for these purposes if other conditions apply. For example, if there were a hypothetical site where a trichloroethene (TCE) spill had occurred and the TCE data for many or all of the samples were rejected, the data may not be usable for making site-specific determinations even if all the non-TCE data were analytically sound and available for use by the project team. In order to avoid confusion of terms, this data quality evaluation differentiates the “availability” of results from “usability” of results. “Available” results are analytically sound and available for use by the project team to make decisions, even if they are not usable for a particular purpose.

The three major categories of data evaluation are laboratory performance, field collection performance (i.e. blank contamination), and matrix interferences. Evaluation of laboratory performance is a check for compliance with the method requirements; in other words, a check of whether the laboratory analyzed the samples within the limits of the analytical method. Additionally, a third-party validator (DataQual Environmental Services, LLC) conducted a review of the laboratory data to assess whether the analytical methods were within required control limits at the time of analysis. Evaluation of potential matrix interferences involves the review of several areas of results, including surrogate spike recoveries, matrix spike recoveries, and duplicate sample results. Evaluation of field collection performance, such as blank contamination and field duplicates, involves the review of field quality control (QC) and the determination of their effect on the sample results.

The data evaluation and validation is a multi-tiered approach. The process begins with an internal laboratory review, continues with a review by a third-party data validator, and ends with an overall review by the Navy contractor project chemistry team. The process provides a medium for essential communication between the laboratory, validator, and project team, and allows for data quality to be thoroughly evaluated.

This document presents the results of the data quality evaluation performed on the data set corresponding to Vieques West Solid Waste Management Unit (SWMU) 6 (site), discrete sediment (matrix), and July 28 - August 6, 2014 (date range).

1.1 Laboratory Internal Quality Control Review

Prior to releasing the analytical data, the laboratory (Empirical Laboratories, LLC) reviewed both the sample and QC data to verify sample identity, instrument calibration, limit of quantitation (LOQ), dilution factors, numerical computations, accuracy of transcriptions, and chemical interpretations. In addition, the QC data were tabulated and the results reviewed to ascertain whether they were within the contract-required or laboratory-defined limits for accuracy and precision. Any non-conforming data were discussed in the data package cover letter and case narrative. The case narrative was then reviewed by the data validator and incorporated into the data validation report. If necessary, the exceedances were verified and qualifiers were applied based on this information.

1.2 Data Validation

A third-party data validator reviewed all data packages using the validation criteria outlined in the site-specific Uniform Federal Policy (UFP)-Sampling and Analysis Plan (SAP) Worksheets #34-36 (CH2M HILL, June 2014). For the most part, these Worksheets reference the appropriate Region II Standard Operating Procedure (SOP) if such an SOP exists for that analysis method. Then, UFP-SAP limits are used in place of those referenced in the SOP. If a Region II SOP does not exist for the analysis method, then the data are validated against the limits in

the UFP-SAP. Guidance and qualifiers are taken from related Region II SOPs and guidance is taken from National Functional Guidelines. The following protocol was used for validation:

- For PEST/PCB via SW-846 8082A:
  - UFP-SAP limits for field QC samples, accuracy/precision, calibrations, and laboratory QC samples
  - Data qualifiers from “Polychlorinated Biphenyl (PCB) Aroclor Data Validation (SOP HW-37, Rev. 3)” (May, 2013)
  - Guidance from United States Environmental Protection Agency (EPA) “USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review” (EPA-540-R-08-01, June 2008) as needed
- For METAL via SW-846 6010C:
  - UFP-SAP limits for field QC samples, accuracy/precision, calibrations, and laboratory QC samples
  - Data qualifiers from “ICP-AES Data Validation (SOP HW-2a, Rev. 15)” (January, 2012)
  - Guidance from "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review” (EPA 540-R-10-011, January 2010) as needed

As stated above, the data validation process was separate from the laboratory’s internal review. The process was specifically focused on the effects of the laboratory’s performance and sample matrix on the analytical results. Areas of review consisted of holding time compliance, surrogate recovery accuracy, matrix spiked sample precision and accuracy, blank contamination, initial and continuing calibration accuracy and precision, laboratory control sample accuracy, internal standard response and retention time accuracy, instrument tune criteria accuracy, and duplicate sample precision (laboratory replicates and field duplicates).

Multiple analyses are most-often the result of concentrations exceeding the calibration range or QC results outside of control limits. When multiple analyses were performed, the “best result” was selected for purposes of this data quality evaluation. Among multiple valid and/or invalid results, the “best result” is:

1. The non-rejected result
2. The result from the appropriate concentration range (dilution factor)
3. The detect when one or more result is detected and one or more result is nondetect
4. The greater of detects, and
5. The lesser of nondetects (U-Values)

Qualification of data is not an unusual occurrence. To define a laboratory QC exceedance and when a laboratory QC exceedance occurs, the laboratory refers to its in-house SOPs. The SOPs are based on United States Department of Defense (DOD) requirements, the requested analytical method, and accumulated laboratory experience. When a laboratory QC exceedance occurs, the situation may be acceptable or it may require further action by the laboratory, such as application of a laboratory qualifier or re-extraction and/or reanalysis of the sample. The data validator uses a separate set of QC criteria, based on guidance from the EPA region that applies to the samples. A laboratory QC exceedance may not constitute a data validation exceedance and a data validation exceedance may not constitute a laboratory QC exceedance. Data validation criteria exceedances may result in the qualification of or rejection of data, as deemed appropriate by the data validator.

The data validator examines each data point and determines any effects that QC exceedances have had. Most often, these effects dictate that the result or limit of detection (LOD) should be considered estimated, but is still available for use. The J-qualification, UJ-qualification, and U-qualification of results are common occurrences and have no adverse effect on the availability of that result to the project team for making decisions. J-qualified results are available, at the reported concentration, for use as detects as long as they are considered “estimated” by the project team. Human health risk assessment guidance suggests that these qualifiers “indicate uncertainty in the reported concentration of the chemical, but not in its assigned identity. Therefore, these data can be used just as positive data with no qualifiers or codes.” In addition, the same risk assessment

guidance (EPA, 1989) suggests that one should use “J-qualified concentrations the same way as positive data that do not have this qualifier.” U-qualified and UJ-qualified results are available, at the reported LOD or level, for use as nondetects as long as they are considered “nondetect,” “not detected at significantly greater than that in an associated blank” or “nondetect, estimated LOD,” as appropriate.

In extreme cases, a result is rejected and deemed to be unusable. “Unusable” in this instance is defined as a result that is not analytically sound and is not generally considered available for use by the project team. In some cases, the project team may still decide to use a rejected result. An example of this occurrence would be if a result is rejected because it is biased extremely high, yet it is still below the screening level (SL). A conservative decision may be made to consider this result a non-exceedance, even if its concentration was rejected. For that reason, it is important to examine why a result was rejected. For the most part, however, rejected results are not usable, and the R-qualifier is the only qualifier that has an adverse effect on the availability of data.

In large data sets, rejected results are often inconsequential because there are sufficient non-rejected data available to the project team. If there are enough non-rejected data or the project team is able to infer results from adjacent sampling locations or there is other site-specific information that can provide additional lines of evidence, it may not be necessary to know the concentrations of some rejected constituents. It may also not be necessary to prove a constituent’s absence if there are sufficient additional lines of evidence.

1.3 Primary Data Validation Qualifiers

The following data validation qualifiers were applied to one or more analytical results:

- **U** - Not detected. Sample was analyzed for this parameter, but it was not detected at greater than the reported LOD. The data validator may also apply this qualifier to indicate that a concentration was not detected at significantly greater than that in an associated blank. Thus, this qualifier does not necessarily indicate a quality control exceedance.
- **UJ** – Not detected, LOD estimated. Sample was analyzed for this parameter, but it was not detected above the reported LOD. The LOD for this parameter is estimated due to a quality control exceedance.
- **J** - Concentration estimated. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample (estimated). Often, a J-qualifier is applied simply because the result was less than the limit of quantitation and thus does not necessarily indicate a quality control exceedance.
- **J^-** - Potential low bias. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample (estimated). Furthermore, the result is affected by a potential low bias, and thus the concentration may be higher.
- **J^+** - Potential high bias. The parameter was positively identified and the associated numerical value is the approximate concentration of the parameter in the sample (estimated). Furthermore, the result is affected by a potential high bias, and thus the concentration may be lower.
- **NJ** - Qualitative identification questionable due to poor resolution. The parameter was presumptively identified and the associated numerical value is the approximate concentration of the parameter in the sample.
- **[No qualifier present] -** Detected. Qualification was not warranted.

Note that, for this particular data set (Vieques West SWMU 6 discrete sediment samples collected between July 28 and August 6, 2014), no results were R-qualified as “rejected” and no detects were U-qualified due to blank contamination. The U-qualifier does not indicate a quality control exceedance.

1.4 Impact of Data Quality on Project Data Quality Objectives and Data Usability

The laboratories analyzed the samples in accordance with EPA SW-846 methods. The data packages were reviewed by a data validator taking guidance from USEPA Region II Validation procedures.

The laboratory utilized various qualifiers to represent “below reporting limit,” “nondetect,” and “detected.” Any other extraneous laboratory qualifiers were superseded by data validation qualifiers. The data validator utilized J-qualifiers, J^+-qualifiers, J^--qualifiers, UJ-qualifiers, U-qualifiers, and NJ-qualifiers to represent “estimated,” “biased high,” “biased low,” “nondetect, estimated LOD,” “nondetect or not detected at significantly greater than that in an associated blank,” and “tentatively identified” respectively. The only time the data validator would change a result’s detect status was when J-qualifiers change to U-qualifiers (detect to nondetect) as a result of blank contamination. That did not occur for this data set.

The J- and UJ-qualifiers indicate that some results are estimated. These qualifiers indicate that data are available for use as detects, and nondetects, respectively. These qualifiers do not necessarily indicate a problem that adversely affects the availability of data. For example, J-qualifiers are often applied simply because results are below the quantitation limit. J+ and J- qualifiers also indicate “estimated” detections but also indicate the direction of the bias.

1.5 Comparison of Nondetects to Screening Levels

When evaluating the data and making decisions, the project team compares detected sample results to SLs in order to determine exceedances. For this project, the SLs are as follows:

- Project Remediation Goals (PRGs) as documented in the UFP-SAP Work Plan.

The lead sediment data consisted of 140 detections ranging from 0.84 to 731 milligrams per kilogram (mg/kg) (the PRG is 218mg/kg). There was one nondetect at 2.32mg/kg.

The zinc sediment data consisted of 131 detections ranging from 2.98 to 1110mg/kg (the PRG is 410mg/kg). There were ten nondetects ranging from 6.5 to 8.42mg/kg.

Because it is assumed that Aroclor-1242, Aroclor-1254, and Aroclor-1260 are present at the site, these analytes (one half the reporting limit) contribute to Total Aroclors even when nondetect in a sample. Therefore, Total Aroclors is detected in each sample, and detections ranged from 15.6 to 405.5 microgram/kilogram (ug/kg) (the PRG is 1000ug/kg). When at least one Aroclor was detected in a sample, Total Aroclors ranged from 30.8 to 405.5ug/kg. When no Aroclors were detected in a sample, Total Aroclors ranged from 15.6 to 56.65ug/kg.

All nondetect results were at less than the PRG.

It should also be noted that of the individual Aroclors (1016 through 1268), only Aroclor-1242, Aroclor-1254, and Aroclor-1260 were detected. Detections ranged from 16.1 to 286ug/kg. Nondetects ranged from 10.4 to 123ug/kg. For Aroclor-1254, the highest nondetect was 123ug/kg, supporting a potential PRG of 200ug/kg for Aroclor-1254.

SECTION 2

Vieques West SWMU 6 Sediment

The purpose of this data quality evaluation is to summarize the findings of the data validation and any effects on the availability of the sediment data within Vieques West SWMU 6, as well as to provide an assessment of data usability. Sediment samples were collected by CH2M HILL, Inc. between July 28 and August 6, 2014.

2.1 Sediment Metals

Lead and Zinc were analyzed via SW-846 6010C. The validation process resulted in the following qualifiers for results in the metals fraction:

Matrix	Analysis Group	Validator Qualifier	Reason Code	Count	Percent
Sediment	METALs	J	[none]	174	61.70%
Sediment	METALs	[none]	[none]	50	17.73%
Sediment	METALs	J	OT	35	12.41%
Sediment	METALs	U	[none]	11	3.901%
Sediment	METALs	J	FD	10	3.546%
Sediment	METALs	J^+	MSH	2	0.7092%
				282	100.0%

100.00% not R-flagged and available for use

The “OT” reason code indicates that a J-qualifier was applied due to percent solids exceeding 50%. The “FD” reason code indicates that a J-qualifier was applied due to field duplicate relative percent difference exceeding the upper control limit. The “MSH” reason code indicates the J^+-qualifier was applied due to matrix spike recovery exceeding the upper control limit. Both METALs results affected by a potential high bias were less than the corresponding PRG.

2.2 Sediment Aroclors

SOM01-list Aroclors were analyzed via SW-846 8082A. The validation process resulted in the following qualifiers for results in the Aroclors fraction:

Matrix	Analysis Group	Validator Qualifier	Reason Code	Count	Percent
Sediment	PEST/PCBs	U	[none]	1042	73.90%
Sediment	PEST/PCBs	UJ	SSL	294	20.85%
Sediment	PEST/PCBs	J	2C	18	1.276%
Sediment	PEST/PCBs	UJ	HT	16	1.135%
Sediment	PEST/PCBs	UJ	OT	10	0.7092%
Sediment	PEST/PCBs	[none]	[none]	9	0.6383%
Sediment	PEST/PCBs	J	[none]	9	0.6383%
Sediment	PEST/PCBs	J-	SSL	6	0.4255%
Sediment	PEST/PCBs	J	HT	4	0.2837%
Sediment	PEST/PCBs	NJ	2C	2	0.1418%
				1410	100.0%

100.00% not R-flagged and available for use

The soil screening level (SSL) qualifier indicates that a J⁻-qualifier or UJ-qualifier was applied due to spiked surrogate recovery less than the lower control limit. The “2C” reason code indicates that a J-qualifier or NJ-qualifier was applied due to dual-column relative percent difference exceeding the upper control limit. The “HT” qualifier indicates that a J-qualifier or UJ-qualifier was applied due to holding time exceedances. The “OT” reason code indicates that a J-qualifier or UJ-qualifier was applied due to percent solids exceeding 30%.

Of the six PEST/PCBs results affected by a potential low bias, only three have a PRG. Although these detections are estimated, potentially biased low (and thus the actual concentration may be higher) and are less than the PRG, it should be noted that the detections range from 2.8% of the PRG to 10.8% of the PRG (they are not close to the PRG).

SECTION 3

PARCC Considerations

3.1 Precision

Precision is defined as the agreement between duplicate results and was characterized by comparing duplicate matrix spike recoveries, laboratory replicates, and field duplicate sample results. For this data set, precision was also assessed by examining dual-column reproducibility (percent difference between instrument columns). There is no actual significant negative impact on precision because no data points were deemed unusable (rejected) due to precision exceedances. Minor precision exceedances were noted. Ten detections were J-qualified as “estimated” due to field duplicate relative percent difference exceeding the control limit. Because they are noted via the field duplicate, these are likely the result of matrix heterogeneity and not associated with analytical non-conformances. Eighteen detections were J-qualified as “estimated” and two detections were NJ-qualified as “tentatively identified” due to dual-column reproducibility. These minor precision exceedances do not affect the overall reliability of the results because the affected (qualified but not rejected) results are available for use by the project team.

3.2 Accuracy

Accuracy is a measure of the agreement between an experimental determination and the true value of the parameter being measured. For organic analyses, each sample was spiked with surrogate compounds; and for organic and inorganic analyses, a matrix spike (MS)/matrix spike duplicate (MSD) and laboratory control sample (LCS) were spiked with a known parameter concentration before preparation. Internal standards also provide a measure of accuracy. Internal standards, surrogates, and MS/MSD provide a measure of the matrix effects on the analytical accuracy. LCS demonstrates accuracy of the method and the laboratory’s ability to meet the method criteria. Accuracy is also assessed by calibration recoveries. Minor accuracy exceedances were noted. Two results were J^+-qualified as “biased high” due to matrix spike recovery at greater than the upper control limit. Although this may indicate a potential high bias, the exceedance is not severe enough to warrant rejection and thus there is no negative impact on the availability of data. A total of 294 nondetect results were UJ-qualified as “nondetect, estimated reporting limit” and six results were J^--qualified as “biased low” due to spiked surrogate recovery at less than the lower control limit. This is likely a result of matrix effects because the surrogate QC is sample-specific and confirmed by reanalysis. Although this may indicate a potential low bias, the exceedance is not severe enough to warrant rejection, and thus this does not affect the availability or reliability of the data. Although these minor accuracy exceedances warrant qualification, they do not affect the overall reliability of the results because the affected (qualified but not rejected) results are available for use by the project team.

3.3 Representativeness

Representativeness is a qualitative measure of the degree to which sample data accurately and precisely represent a characteristic environmental condition (in this case, nature, and extent of contamination). Representativeness is a subjective parameter and is used to evaluate the efficacy of the sample planning design. In terms of data quality, representativeness was assured because the sampling team followed approved standard operating procedures for sample collection and handling, and the laboratory followed approved standard operating procedures for sample handling, preparation, and analysis.

3.4 Completeness

For purposes of this DQE, completeness is defined as the percentage of measurements that are judged to be valid; validity being defined by the data quality objectives (DQOs). Therefore, completeness is calculated as the

number of analytically-sound results that are available for use compared to the total number of measurements made. “Polychlorinated Biphenyl (PCB) Aroclor Data Validation (SOP HW-37, Rev. 3)” (May, 2013); “USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review” (EPA-540-R-08-01, June 2008); “ICP-AES Data Validation (SOP HW-2a, Rev. 15)” (January, 2012); and "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review” (EPA 540-R-10-011, January 2010) designate all results except those R-qualified as “rejected” to be available for use as analytically-sound results. The R-qualifier is the only qualifier that negatively affects a data point’s availability. Completeness is provided, above, for each combination of matrix and analysis group.

No results were R-qualified as “rejected.” 76.54% of results (1295 of 1692) are available for use as reported by the laboratory. The remaining 23.46% of results (397 of 1692) are available for use as qualified by the data validator. The results are 100% available, and the overall completeness goal of 95% was met for this data set.

3.5 Comparability

Comparability is a qualitative measure designed to express the confidence with which one data set may be compared to another. Factors that affect comparability are sample collection and handling techniques, sample matrix, and analytical methods. In this case, because approved standard operating procedures were used for sample collection and handling, a common sample matrix was evaluated (sediment) and EPA SW-846 methods were utilized, the data user may express confidence in the fact that this data set is comparable to others of acceptable data quality. In addition, comparability is controlled by the other PARCC parameters because data sets can be compared with confidence only when precision and accuracy are known. Except in the case of rejected data (there were no rejected data in this set), precision and accuracy were demonstrated to be acceptable, and the data user may be confident that this data set is comparable to others of high data quality.

SECTION 4

References

CH2M HILL. 2014. *Contaminated Sediment Delineation to Support Feasibility Study Alternative Evaluation Sampling and Analysis Plan, Solid Waste Management Unit (SWMU) 6, Atlantic Fleet Weapons Training Area-Vieques, Former Naval Ammunition Support Detachment, Vieques, Puerto Rico.* June.

U.S. Environmental Protection Agency (EPA). 1989. *Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual.*

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U.S. Environmental Protection Agency (EPA). 2012. *ICP-AES Data Validation (SOP HW-2a, Rev. 15).* January.

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Appendix F
Ecological Screening – Sample-Specific Data

Appendix F

PRG Exceedances - SWMU 6 Surface Sediment - Post-Removal Conditions

Former Naval Ammunition Support Detachment, Vieques, Puerto Rico

Chemical	Sediment PRG	VWW06-SD003	VWW06-SD004	VWW06-SD005	VWW06-SD006		VWW06-SD007	VWW06-SD008	VWW06-SD009	VWW06-SD010	VWW06-SD024		VWW06-SD025
		VWW06-SD003-0211	VWW06-SD004-0211	VWW06-SD005-0211	VWW06-SD006-0211	VWW06-SD006P-0211	VWW06-SD007-0211	VWW06-SD008-0211	VWW06-SD009-0211	VWW06-SD010-0211	VWW06-SD024-0006	VWW06-SD024P-0006	VWW06-SD025-0006
		02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	02/04/11	08/05/14	08/05/14	08/05/14
Inorganics (MG/KG)													
Lead	218	442	185	157 J	93 J	79.3 J	11.8 J	6.8 J	612 J	134 J	160	194	300
Zinc	410	440	262	237 J	206 J	162 J	25.4 J	11 J	849 J	164 J	200	226	509

Notes:
Grey highlighting indicates value greater than PRG
Bold indicates detections

Chemical	Sediment PRG	VWW06-SD026	VWW06-SD027	VWW06-SD028	VWW06-SD029	VWW06-SD030	VWW06-SD031	VWW06-SD032	VWW06-SD033	VWW06-SD034	VWW06-SD035		VWW06-SD036
		VWW06-SD026-0006	VWW06-SD027-0006	VWW06-SD028-0006	VWW06-SD029-0006	VWW06-SD030-0006	VWW06-SD031-0006	VWW06-SD032-0006	VWW06-SD033-0006	VWW06-SD034-0006	VWW06-SD035-0006	VWW06-SD035P-0006	VWW06-SD036-0006
		08/05/14	08/05/14	08/05/14	08/04/14	08/04/14	08/04/14	08/04/14	08/05/14	08/01/14	08/01/14	08/01/14	08/01/14
Inorganics (MG/KG)													
Lead	218	363	455	357	161	164 J	205 J	273 J	307	104 J	84.6 J	118 J	167 J
Zinc	410	892	439	409	178	231 J	446 J	383 J	545	175 J	274 J	462 J	188 J

Notes:
Grey highlighting indicates value greater than PRG
Bold indicates detections

Chemical	Sediment PRG	VWW06-SD037	VWW06-SD038	VWW06-SD039	VWW06-SD040	VWW06-SD041	VWW06-SD042	VWW06-SD043	VWW06-SD044	VWW06-SD045	VWW06-SD046	VWW06-SD047	VWW06-SD048
		VWW06-SD037-0006	VWW06-SD038-0006	VWW06-SD039-0006	VWW06-SD040-0006	VWW06-SD041-0006	VWW06-SD042-0006	VWW06-SD043-0006	VWW06-SD044-0006	VWW06-SD045-0006	VWW06-SD046-0006	VWW06-SD047-0006	VWW06-SD048-0006
		07/31/14	07/31/14	07/31/14	07/30/14	07/30/14	07/30/14	07/30/14	07/31/14	07/31/14	07/29/14	07/29/14	07/29/14
Inorganics (MG/KG)													
Lead	218	191 J	1.88 J	289 J	79.6	111	131 J	420 J	182	731 J	145	83.3	183 J
Zinc	410	264 J	10.7 J	478 J	112	126	187 J	548 J	283	1,110 J	335	125	318 J

Notes:
Grey highlighting indicates value greater than PRG
Bold indicates detections

Chemical	Sediment PRG	VWW06-SD049	VWW06-SD050		VWW06-SD051	VWW06-SD052	VWW06-SD053	VWW06-SD054	VWW06-SD055
		VWW06-SD049-0006	VWW06-SD050-0006	VWW06-SD050P-0006	VWW06-SD051-0006	VWW06-SD052-0006	VWW06-SD053-0006	VWW06-SD054-0006	VWW06-SD055-0006
		07/29/14	07/29/14	07/29/14	07/28/14	07/28/14	07/28/14	07/28/14	07/30/14
Inorganics (MG/KG)									
Lead	218	211	290 J	213 J	74.6	73.4	240	142 J+	96.6
Zinc	410	294	535 J	422	113	283	377	247 J+	234

Notes:
Grey highlighting indicates value greater than PRG
Bold indicates detections

Appendix G
Ecological Setting Site Photo-Documentation

Photo 1 - SWMU 6 lagoon – January 2010 (panorama). Recently planted mangrove restoration area at far right (eastern end).

Photo 2 - Area of recently planted red mangrove propagules at eastern end of lagoon (January 2010).

Photo 3 - SWMU 6 Lagoon – October 2013 (panorama). Mangrove restoration area at far right (eastern shoreline).

Photo 4 - Successful mangrove establishment (December 2014), same location as historic Photo #2 at eastern shoreline of lagoon.

Photo 5 - View of mangrove restoration area near northern end of lagoon (January 2010); northern connection with a lobe of Laguna Kiani in background.

Photo 6 – Significant growth of planted red mangroves as of December 2014, same view as Photo #5 at northern end of lagoon.

Photo 7 - View of western shoreline of lagoon (January 2010), where no mangroves were historically planted.

Photo 8 – Naturally recruited mangroves (red, white, and black mangroves) along the western shoreline of the lagoon (December 2014).

Photo 9 - Naturally recruited patch of turtle grass (Thalassia testudinum) within the northern end of the lagoon, near outlet to lobe of Kiani Lagoon.

Photo 10 - Naturally recruited colony of feather algae (Caulerpa sertularioides) within the northern end of the lagoon, near outlet to lobe of Kiani Lagoon.

Photo 11 – Speckled Worm Eel (Myrophis punctatus)

Photo 12 – Checkered Puffer (Sphoeroides testudineus)

<u>Photo 13</u> – Bigeye Mojarra (Eucinostomus havana)

<u>Photo 14</u> – Crested Goby (*Lophogobius cyprinoides*)

Photo 15 – Bay Whiff (Citharichthys spilopterus)

Photo 16 – White Mullet (*Mugil curema*)

Photo 17 – An example qualitative dip net sample showing various snails, mussels, clams, and algae.

Photo 18 – Wedge clam (*Tellina* sp.)

Photo 19 – Purplish Tagelus (*Tagelus divisus*); a mussel species

Photo 20 – Virgin Nerites (*Neritina virginea*); colors extremely variable

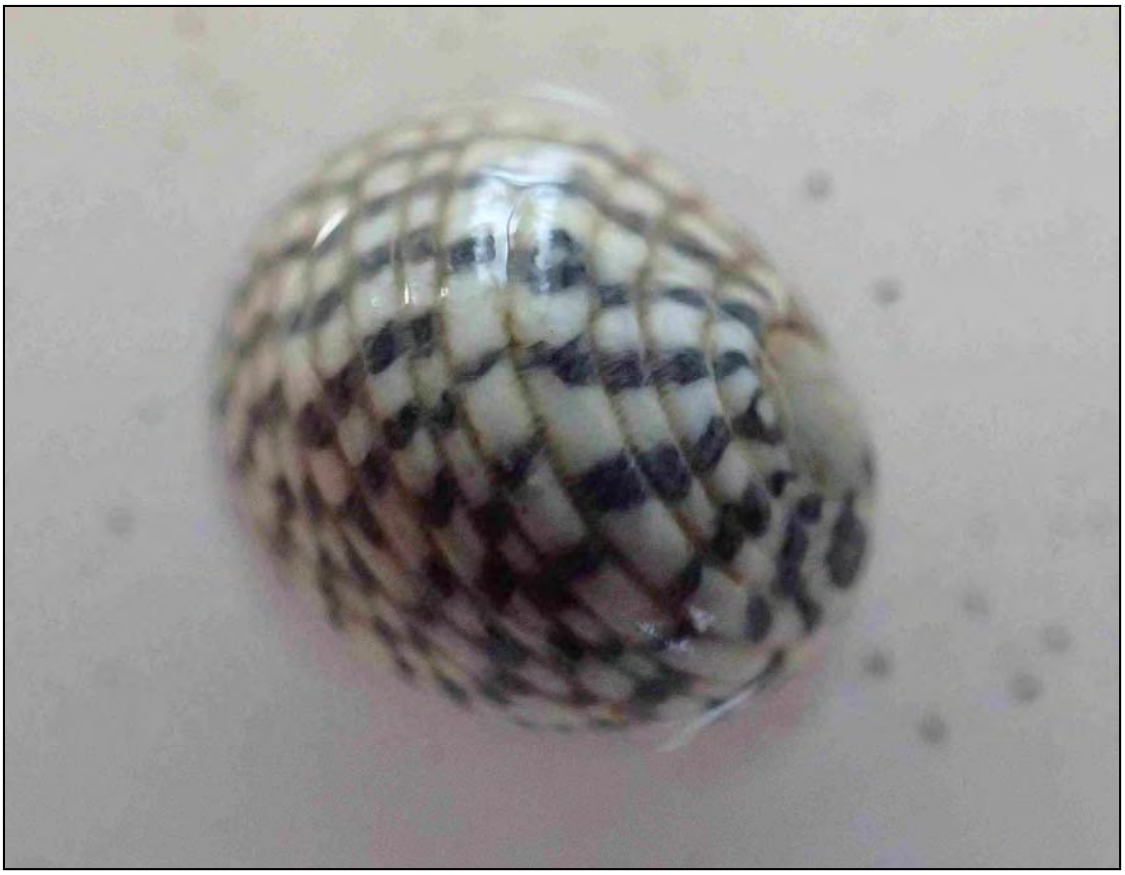

Photo 21 – Tessellate Nerite (*Nerita tessellate*)

Photo 22 – Bubble shell (*Haminoea* sp.)

Photo 23 – Amphipod species

Photo 24 – Caribbean Mud Fiddler Crab (*Uca rapax*) – common year-round

Photo 25 – Blue Crab (*Callinectes sapidus*)

Photo 26 – Brown Shrimp (*Farfantepenaeus aztecus*)

Photo 27 – Dense population of upside-down jellyfish (*Cassiopea xamachana*) throughout the lagoon, year-round.

Photo 28 - Close-up view of upside-down jellyfish (*C. xamachana*).

Photo 29 – Wilson's Plover (*Charadrius wilsonia*)

Photo 30 – Least Sandpiper (*Calidris minutilla*)

Photo 31 – Greater Yellowlegs (*Tringa melanoleuca*)

Photo 32 – Black-bellied Plover (*Pluvialis squatarola*)

Appendix H
Final Responses to Regulatory Agency Comments

Final Responses to EPA Comments on the Remedial Investigation Report Addendum, Solid Waste Management Unit (SWMU) 6 Atlantic Fleet Weapons Training Area – Vieques Former Naval Ammunition Support Detachment, Vieques, Puerto Rico

4. **Evaluation of Potential Risk to Benthic Organisms, 1st paragraph, Page 2:** The text discusses ecologically-based PRGs developed for lead and zinc, but the text does not indicate how the PRGs were calculated or derived. Revise the text to clarify how the PRGs were developed and which receptor groups they are designed to protect.

   Navy Response: The PRGs for lead and zinc were developed as part of the FS (CH2M HILL, 2013). This information will be summarized in the RI Report Addendum.

All of our comments were incorporated into the Draft RI Report Addendum for SWMU 6 with the **exception of the response to 'specific comment' # 4 (above)**. In the second paragraph of the **Introduction**, the discussion regarding the development of PRGs does not clearly indicate why cadmium and copper are not a concern. A sentence should be added between the third and fourth sentences so that the development of PRGs for only PCBs, lead and zinc is clearly understood.

Navy Response: In the second paragraph of Section 1 (Introduction), the fourth sentence has been revised, new sixth and seventh sentences have been added, and the original sixth sentence has been revised such that the paragraph now reads:

> "The SWMU 6 Remedial Investigation . . . . . to benthic organisms (CH2M HILL, 2013). As discussed in Section 5.4 of the FS (CH2M HILL, 2013), sediment preliminary remediation goals (PRGs) were developed for Aroclor-1254, lead, and zinc. Based on discussions held at the May 2013 Technical Subcommittee meeting, the PCB-related COC was concurred be total PCBs (i.e., sum of aroclors) rather than just aroclor-1254, and 1 mg/kg was concurred on as the corresponding PRG for protection of human health (CH2M HILL, 2014). For protection of benthic organisms, Effects Range-Median (ER-M) values, which represent the 50th percentile of the ranked effects data used to develop the ER-L, were selected to identify sediment PRGs because of: (1) the level of conservatism of the Effects Range-Low (ER-L) values, (2) the ecological Remedial Action Objective (RAO) stated in Section 5.2 of the FS, and (3) the past use of ER-M values as remediation criteria at other CERCLA sites. Because the ER-M values for cadmium and copper were higher than their maximum detected concentrations in SWMU 6 lagoon sediment, no PRGs for these two inorganics were necessary. Based on the PRGs developed for Aroclor-1254 (1 mg/kg), lead (218 mg/kg), and zinc (410 mg/kg), a contaminated sediment delineation study was subsequently implemented in 2014 to determine the horizontal and vertical extent of these sediment COC concentrations above PRGs. The details . . . . "

Final Response to PREQB Comments on the Remedial Investigation Report Addendum, Solid Waste Management Unit (SWMU) 6 Atlantic Fleet Weapons Training Area – Vieques Former Naval Ammunition Support Detachment, Vieques, Puerto Rico

Page 1-3, 4th Paragraph: The last sentence in this section concludes that no unacceptable risks to the benthic community exist because the mean HQs for lead and zinc are less than 1. Although the mean HQs (but not the 95% UCLs of the mean) are less than 1, that is only one component within the weight-of-evidence that was used to arrive at a finding of no significant risk. The observations detailing a healthy biological community along with PRG exceedances within a relatively small proportion of the lagoon were also considered along with risk management concerns associated with disruption of habitat resulting from site remediation. Please consider revising this concluding sentence to reflect these additional considerations rather than relying on mean HQs.

Navy Response: Because Section 1.2 is comparison of analytical results (summarized in Section 1.1) to ecologically-based sediment PRGs, the concluding sentence is associated with the Section 1.2 evaluation. The health of the lagoon biological community is presented in Section 2. However, the fourth paragraph of Section 1.2 has been modified to refer the reader to additional biological indicators of ecosystem health discussed in Section 2, as follows:

> "Mean HQs for lead and zinc in lagoon surface sediment are less than 1, an important indicator of no unacceptable risk to the benthic community and that no further remedial action is warranted. As discussed in Section 2 below, recent ecological surveys of the SWMU 6 lagoon have documented a healthy, maturing habitat supporting a wide variety of aquatic and semi-aquatic plant and animal species, which additionally supports no further action."

Additionally, the last sentence in Section 2 (SWMU 6 Lagoon Ecosystem Evaluation) has been modified as follows:

> "The healthy, maturing ecosystem characteristics of the SWMU 6 lagoon, together with results of the ecological risk screening showing no unacceptable risk to the benthic community (Section 1.2), demonstrates no additional remedial action is warranted."

Further, the first paragraph of Section 3 (Conclusions) has been modified to address information provided in the comment, as follows:

> "The SWMU 6 sediment delineation investigation, which included the analysis of COCs (total PCBs, lead, and zinc) in 128 surface and subsurface lagoon sediment samples (plus QA/QC samples), showed that total PCBs were below the PRG in all samples. Zinc and lead exceeded PRGs in a low number of samples representing a small portion of the lagoon (approximately 0.07 acre); however, mean concentrations, which are more applicable to evaluating communities of benthic organisms, were below respective PRGs (i.e., neither of the two mean HQs exceeded 1). In addition, a characterization of the SWMU 6 lagoon ecosystem in December 2014 documented a diverse, and in many cases very abundant, community of fish and invertebrates that are typical of mangrove lagoons. Planted and naturally recruited mangroves and seagrass are successfully filling in open habitats created by the 2009 removal action, and the lagoon is providing forage for a variety of birds including many migratory species. Additional intrusive site remedial actions would significantly disrupt the ongoing successional development of this lagoon ecosystem."