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REMEDIAL INVESTIGATION REPORT FOR SITE 3 NORTHWEST LANDFILL NCBC
GULFPORT MS
11/11/2011
TETRA TECH

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-04-D-0055



Rev. 2
11/11/11

Remedial Investigation Report for Site 3 – Northwest Landfill

Naval Construction Battalion Center Gulfport
Gulfport, Mississippi

Contract Task Order 0041

November 2011



NAS Jacksonville
Jacksonville, Florida 32212-0030



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Project Number 112G00464

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Reference: CLEAN IV Contract Number N62467-04-D-0078
Contract Task Order Number 0041

Subject: Final Remedial Investigation Report, Rev. 2, Site 3 – Northwest Landfill
Naval Construction Battalion Center Gulfport, Mississippi

Dear Mr. Cook:

Tetra Tech NUS, Inc. (Tetra Tech) is pleased to submit the Final Remedial Investigation Report, dated November 11, 2011, Rev. 2, for Site 3 – Northwest Landfill, at the Naval Construction Battalion Center (NCBC) Gulfport, Mississippi.

If you have any questions with regard to this submittal, please feel free to contact me at (904) 730-4669, extension 215, or via e-mail at Gregory.Roof@TetraTech.com.

Sincerely,

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**REMEDIAL INVESTIGATION REPORT
FOR
SITE 3 – NORTHWEST LANDFILL
NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI
COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT**

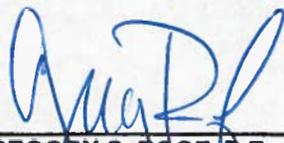
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**CONTRACT NUMBER N62467-04-D-0055
CONTRACT TASK ORDER 0041**

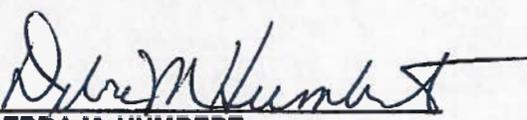
JULY 2011

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PROFESSIONAL CERTIFICATION

Remedial Investigation Report
Site 3 - Northwest Landfill
Naval Construction Battalion Center
Gulfport, Mississippi

This document, *Remedial Investigation Report, Northwest Landfill, Naval Construction Battalion Center (NCBC), Gulfport, Mississippi*, has been prepared under the direction of and reviewed by a Mississippi Registered Professional Engineer. The work and professional opinions rendered in this report were conducted or developed in accordance with State of Mississippi Standard Operating Procedures and commonly accepted procedures consistent with applicable standards of practice at the time the report was prepared. If conditions are determined to exist that differ from those described, the undersigned should be notified to evaluate the effects, if any, of additional information on the assessment described in this report.

This document was prepared for *Site 3 at NCBC Gulfport, Mississippi* and should not be construed to apply to any other site.

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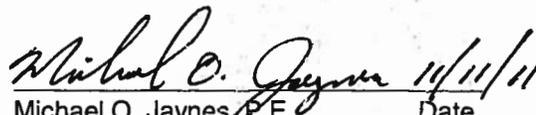

Michael O. Jaynes, P.E. Date
Professional Engineer
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Expires: December 31, 2011

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ACRONYMS AND ABBREVIATIONS

2,4-D	2,4-dichlorophenoxyacetic acid
2,4,5-T	2,4,5-trichlorophenoxyacetic acid
ABB-ES	ABB Environmental Services, Inc.
ACH	air chang per hour
ADAF	age-dependent adjustment factor
APHA	American Public Health Association
ATSDR	Agency for Toxic Substances and Disease Registry
AWQC	Ambient Water Quality Criterion
BCF	bioconcentration factor
BHC	benzene hexachloride
bls	below land surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
BTOC	below top of casing
Cal EPA	California Environmental Protection Agency
CCME	Canadian Council of Ministers of the Environment
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
cm	centimeter
cm ²	cubic centimeter
COC	chemical of concern
COPC	chemical of potential concern
CSF	cancer slope factor
CSM	Conceptual Site Model
CTE	central tendency exposure
CTO	Contract Task Order
CVOC	chlorinated volatile organic compound
DAF	dilution/attenuation factor
DCA	dichloroethane
DCE	dichloroethene
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethylene
DDT	dichlorodiphenyltrichloroethane
DPT	direct-push technology
EA	environmental assessment
Eh	redox potential

ACRONYMS AND ABBREVIATIONS (CONTINUED)

EPC	exposure point concentration
ESV	Ecological Screening Value
°F	degree Fahrenheit
FS	Feasibility Study
GVC	Groundwater Volatilization Criteria
HEAST	Annual Health Effects Assessment Summary Tables
HHRA	Human Health Risk Assessment
HI	hazard index
HLA	Harding Lawson Associates
HO	herbicide orange
HQ	hazard quotient
HSA	hollow stem auger
HSDB	Hazardous Substances Data Bank
IAS	Initial Assessment Study
IEUBK	Integrated Exposure Uptake Biokinetic
ILCR	Incremental Lifetime Cancer Risk
IRIS	Integrated Risk Information system
K_d	distribution coefficient
kg	kilogram
K_{oc}	organic carbon partition coefficient
K_{ow}	octanol/water partition coefficient
L/day	liter per day
LOAEL	lowest observed adverse effect level
$\mu\text{g}/\text{dL}$	microgram per deciliter
μg	microgram
$\mu\text{g}/\text{kg}$	microgram per kilogram
$\mu\text{g}/\text{L}$	microgram per liter
MCEQ	Mississippi Commission on Environmental Quality
MCL	Maximum Contaminant Level
MDEQ	Mississippi Department of Environmental Quality
mg	milligram
mg/kg	milligram per kilogram
mg/L	milligram per liter
MHSPE	Ministry of Housing, Spatial Planning, and Environment
MI	mobility index

ACRONYMS AND ABBREVIATIONS (CONTINUED)

MW	molecular weight
NACIP	Navy Assessment and Control of Installation Pollutants
NCBC	Naval Construction Battalion Center
NCEA	National Center for Environmental Assessment
NCF	Naval Construction Force
NFESC	Naval Facilities Engineering Service Center
NOAA	National Oceanic and Atmospheric Administration
NOAEL	no observed adverse effect level
ORNL	Oak Ridge National Laboratory
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PEC	probable effect concentration
ppq	part per quadrillion
PPRTV	Provisional Peer Reviewed Toxicity Value
PRG	Preliminary Remediation goal
PVC	polyvinyl chloride
RAGS	Risk Assessment Guidance for Superfund
RBC	risk-based concentration
RfC	reference concentration
RfD	reference dose
RGO	remedial goal option
RI	remedial investigation
RME	reasonable maximum exposure
SMDP	scientific/management decision point
SQL	sample quantitation limit
SSL	Soil Screening Level
SVOC	semivolatile organic compound
SWL	static water level
TAL	target analyte list
TCB	trichlorobenzene
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TCE	trichloroethene

ACRONYMS AND ABBREVIATIONS (CONTINUED)

TCL	target compound list
TEC	threshold effect concentration
TEF	toxicity equivalence factor
TEL	threshold effect level
Tetra Tech	Tetra Tech NUS, Inc.
TPH	total petroleum hydrocarbon
TRG	target remediation goal
UCL	upper confidence limit
UNEP	United Nations Environment Programme
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
VDEQ	Virginia Department of Environmental Quality
VF	volatilization factor
VOC	volatile organic compound

EXECUTIVE SUMMARY

The primary objective of this remedial investigation (RI) was to provide data to evaluate current environmental conditions and guide the selection of a remedy that is protective of human health and the environment for any contamination present at Site 3. To achieve this primary objective, samples from various media were collected and analyzed during this RI for the following:

- Determine the extent of the waste disposal area.
- Identify the types of materials disposed of in the landfill and the potential chemicals of concern.
- Determine the extent and sources of mobile contaminants in soil and groundwater.
- Assess the potential impact to media including surface water and sediment in Canal No. 1 and the surficial aquifer.

Site Description

Site 3 is an approximately 3.5-acre former landfill located in the northwestern section of Naval Construction Battalion Center (NCBC) Gulfport. The landfill area is located northeast of the intersection of 8th Street and Colby Avenue and is currently used as a portion of the 16th fairway and 18th tee box at the Pine Bayou Golf Course. The eastern boundary of the landfill is adjacent to Canal No. 1. A small pond is located north of the 16th fairway (Golf Course Pond), and a second larger pond is located south of 8th Street and serves as a water source for golf course irrigation. Canal No. 1 at Site 3 is approximately 30 feet wide and varies in depth from 2 to 4 feet. Storm water runoff from Site 3 flows into various tributary ditches that feed into Canal No. 1. Surface water in Canal No. 1 flows to the north and eventually leaves NCBC Gulfport at Outfall 1, located at 28th Street.

Site History

The Site 3 landfill was in operation from 1948 to 1966. During this time, nearly all of the solid waste and some of the liquid/chemical waste generated at NCBC Gulfport, an estimated 30,000 tons of solid waste (including some additional liquid wastes), were disposed of in this landfill. The landfill was a trench-and-fill operation with daily burning of wastes. A fire-fighting training pit was also suspected to have been located at the site and frequently used from the mid-1950s to 1966. An estimated 130,000 gallons of waste liquids were suspected to have been burned at the fire-fighting training pit (Envirodyne Engineers, 1985). Contamination was first reported in the area designated as Site 3 during the investigation conducted for the Groundwater Monitoring Report in 1995 (Harding Lawson Associates, 1999).

Previous Investigations

These investigations included monitoring well installation, geophysical surveying, and soil, surface water, sediment, and groundwater sampling, but did not completely determine the nature and extent of contamination at the site.

Verification Report – 1987

Following a geophysics survey, three monitoring wells were installed at Site 3. Groundwater samples were collected from the wells, and co-located surface water and sediment samples were collected in the drainage ditch adjacent to 8th Street. Results indicated no significant chemical contamination; however, only one groundwater sample location was downgradient of the waste disposal area identified in the geophysical survey.

Base-wide Groundwater, Surface Water, and Sediment Sampling Program – 1995

The three existing wells were sampled and co-located surface water and sediment samples were collected from Canal No 1 near the 28th Street culvert. Concentrations of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and pesticides detected in groundwater were less than their associated Maximum Contaminant Levels (MCLs). Lead and thallium concentrations exceeded their respective MCLs. Surface water and sediment sample results were less than screening values.

Groundwater Monitoring Report – 1999

Two new groundwater monitoring wells were installed at Site 3 to assess downgradient conditions. Groundwater samples from the wells were analyzed for VOCs, SVOCs, pesticide/polychlorinated biphenyls (PCBs), chlorinated herbicides, and dioxins/furans.

Dioxin concentrations in the new downgradient Site 3 wells were low. Pesticides were detected at levels less than their MCLs. No other contaminants were detected. The results suggested that no significant levels of contamination were migrating off-site via groundwater.

E.1 FIELD INVESTIGATION

Site 3 RI field activities included the following:

- Geophysical investigation (July 2006)
- Soil-gas survey (July to October 2006)
- Direct-push technology (DPT) groundwater screening (October 2006)
- Surface water and sediment sampling (October 2006)
- Monitoring well installation and sampling (June, July, August, and September 2007)

- Subsurface soil sampling (August 2007)
- Surface soil sampling (August 2007)
- Aquifer characterization (August and October 2007)

The screening criteria used to evaluate the nature and extent of contamination in environmental media at Site 3 included the Mississippi Department of Environmental Quality (MDEQ) Tier 1 target remediation goals (TRGs) and United States Environmental Protection Agency (USEPA) human health and ecological criteria. The potential impacts of contaminants identified at Site 3 to human and ecological receptors were evaluated in the Human Health Risk Assessment (HHRA) and the screening-level Ecological Risk Assessment.

E.2 SITE HYDROLOGY

The depth to groundwater at Site 3 ranges from about 1 to 7 feet and is controlled primarily by surface topography and proximity to Canal No. 1. Groundwater flow direction in the shallow and deep groundwater intervals is generally to the east, towards Canal No. 1. The estimated average groundwater velocity for the shallow zone at the site was calculated at 0.24 foot per day, and the estimated average groundwater velocity for the deep zone at the site was calculated at 0.06 foot per day. Vertical gradients were observed in adjacent pairs of shallow and deep monitoring wells, with upward gradients observed in most of the well pairs. Two surface water bodies located near the waste disposal area, Golf Course Pond and North Pond, are hydrogeologically upgradient although North Pond does receive some surface water runoff from the northwestern corner of the site.

E.3 SOIL ASSESSMENT

The release of contaminants at Site 3 most likely resulted from landfill operations. The detection of chlorinated VOCs (CVOCs) and metals in subsurface soil at Site 3 supports the reported disposal of these materials at the site. Contamination detected in surface soil appears to have resulted from typical golf course maintenance activities and the addition of soil from an unknown source during golf course construction.

Concentrations of VOCs in subsurface soil were less than direct exposure screening criteria and the soil screening levels (SSLs) for the soil-to-air pathway. Vinyl chloride was detected in one subsurface soil sample at a concentration that exceeded the SSL for the soil-to-groundwater pathway. The presence of CVOCs is consistent with waste disposal practices and base operations that have included the use of solvents in degreasing.

Polynuclear aromatic hydrocarbon (PAH) concentrations exceeding screening criteria were limited to three surface soil sample locations. The relatively low concentration of PAHs and lack of site-wide occurrence suggest that the existing soil cover over most of the disposal area prevents direct exposure to landfill material. Detected SVOC concentrations in the subsurface soil samples were less than screening criteria.

Pesticides were detected in Site 3 surface and subsurface soil samples at concentrations less than direct exposure human health criteria. The pesticide concentrations were consistent with the use and/or disposal of small quantities of dichlorodiphenyltrichloroethane (DDT), benzene hexachloride isomers, and dieldrin.

Arsenic was detected in each of the 10 soil samples and was the only metal detected in surface soil samples collected at Site 3 with concentrations exceeding human health direct exposure criteria. The arsenic concentrations were within concentration ranges typical for Mississippi Coastal Flatwoods soil. Concentrations of other metals detected in surface soil at Site 3 did not exceed screening criteria for direct exposures to human receptors, but did exceed SSLs for the soil-to-groundwater migration pathway and/or ecological screening values (ESVs) for ecological receptors.

Arsenic was detected in two subsurface soil samples and was the only metal detected in subsurface soil samples with concentrations exceeding human health direct exposure criteria. Subsurface soil arsenic concentrations were within concentration ranges typical for Mississippi Coastal Flatwoods soil. Concentrations of aluminum and chromium detected at Site 3 did not exceed screening criteria for direct exposures to human receptors, but did exceed SSLs for the soil-to-groundwater migration pathway.

The results of the soil analytical program are consistent with the containment strategy of the presumptive remedy, and the direct observation of the field samples confirmed the waste disposal area defined by the geophysical investigation.

The presumptive remedy strategy for Site 3 includes the installation and maintenance of a soil cover. Strategically covering the existing surface will remove important exposure pathways, including direct exposure to surface soil by ecological receptors, potential leaching of contaminants from soil to groundwater, and erosion and transport of surface soil from the landfill. Direct exposure to subsurface soil will be prevented by institutional controls established to maintain the integrity of the cover.

E.4 GROUNDWATER ASSESSMENT

Groundwater characterization samples collected at Site 3 were analyzed for target compound list, target analyte list, and Appendix IX analytes. Groundwater delineation samples were collected using DPT and analyzed for selected VOCs.

A dissolved CVOC plume was delineated at Site 3. Concentrations of vinyl chloride, cis-1,2-dichloroethene (DCE), trans-1,2-DCE, and trichloroethene (TCE) in groundwater exceeded Tier 1 TRGs. The plume appears to have an area of approximately 90,000 square feet. Comparison of analytical data from shallow and deep well pairs indicate that the CVOC plume is limited to the uppermost sand zone of the shallow surficial aquifer, to a depth of approximately 24 feet, and has not migrated vertically.

Data suggest that the phenomena known as “DCE stall” has occurred in the dissolved CVOC plume at Site 3. DCE stall in groundwater systems results when insufficient electron acceptors or substrates, or adverse environmental conditions prevent further biologically mediated reductive dechlorination of VOCs. The presence of the CVOC plume beyond the boundary of the waste disposal area will require additional treatment in addition to the presumptive remedy containment strategy for the landfill.

An arsenic plume was detected in nine wells in the southern portion of the site. The elevated arsenic concentrations occurred upgradient of the landfill and do not appear to be related to waste disposal activities. Elevated iron concentrations were also observed in the majority of the wells with elevated arsenic concentrations. Aluminum, lead, and vanadium exceedances occurred in one monitoring well located adjacent to North Pond, upgradient of the landfill. Thallium was detected in one groundwater sample from a deep well, the only screening criteria exceedance detected in a deep well.

The interaction between the layers of silt and sandy clay and the contaminants at the site appears to have created a vertical barrier to migration. Although not a true aquaclude, these lower permeable layers restrict the movement of contaminants.

E.5 SURFACE WATER AND SEDIMENT ASSESSMENT

Bis(2-ethylhexyl) phthalate was detected in the surface water sample from Golf Course Pond at a concentration greater than the screening criteria.

The concentrations of dichlorodiphenyldichloroethylene (DDE), DDT, total dichlorodiphenyldichloroethane (DDD)/DDE/DDT, alpha-chlordane, gamma-chlordane, and total Aroclors in sediment were less than human health screening criteria; however, concentrations of each of these analytes exceeded ESVs in

one or more samples. The maximum concentrations of DDE, DDT, and PCBs were detected in the furthest upstream sample collected from Canal No. 1.

Iron, lead, copper, and aluminum were detected in one or more surface water samples at concentrations greater than ESVs but less than human health criteria. Arsenic was detected in sediment samples collected from Canal No. 1 and one sample from North Pond and was the only metal detected in Site 3 sediment samples at concentrations exceeding screening criteria. The arsenic concentrations were within concentration ranges typical for Mississippi Coastal Flatwoods soil.

Analytical results for surface water and sediment samples collected from water bodies not directly associated with Site 3 indicated the presence of the same contaminants detected at Site 3. Bis(2-ethylhexyl) phthalate was detected in one sample from Boy Scout Lake. Aluminum, copper, iron, and lead were detected in one or more of these surface water samples at concentrations similar to those in the surface water samples collected at Site 3. Arsenic was detected in sediment samples at concentrations similar to those found at Site 3. These results suggest that the contaminant levels reported in Site 3 surface water and sediment samples reflect base-wide conditions and did not result from releases from the landfill at Site 3.

E.6 MEDIA TO AIR MIGRATION PATHWAY

Air samples were not collected from Site 3 during the RI because the concentrations of volatile contaminants previously detected in soil and groundwater were relatively low. To determine the potential for migration of soil contaminants to the atmosphere, contaminant concentrations were compared to USEPA SSLs. SSLs have been established for various volatiles, pesticides/PCBs, and metals. Concentrations of these classes of analytes that were detected in soil at Site 3 were less than the default SSL values.

USEPA Groundwater Volatilization Criteria have been established for many of the VOCs detected in groundwater at Site 3. Benzene, chloromethane, cis-1,2-DCE, TCE, and vinyl chloride were detected in one or more groundwater samples at concentrations greater than the default criteria, indicating the potential for migration and accumulation of vapors from the groundwater into the atmosphere.

E.7 HUMAN HEALTH RISK ASSESSMENT

An HHRA was performed to evaluate exposure to chemicals of potential concern (COPCs) in surface and subsurface soil, groundwater, surface water, and sediment at Site 3. Estimated risks for site maintenance workers, construction/excavation workers, adult trespassers, and adolescent trespassers assumed to be exposed to COPCs in site media were less than or equal to USEPA and MDEQ risk benchmarks. Cancer

risk estimates developed for lifelong trespassers and industrial workers exposed to soil exceed the MDEQ cumulative risk benchmark. However, it is likely that a significant amount of the arsenic (which accounts for the highest percent of the risk estimates) present is naturally occurring.

The quantitative risk evaluation also indicated that potential adverse health effects may be associated with the hypothetical future residential use of groundwater, and the cancer risk estimate for the future resident exposed to soil exceeds the MDEQ cumulative cancer risk benchmark. The maximum detected concentrations of several VOCs and arsenic in groundwater exceeded USEPA MCLs and MDEQ TRGs. The groundwater underlying and downgradient of Site 3 is not currently used as a source of drinking water, and there are no plans to develop this resource or the Site 3 area for residential purposes in the future.

E.8 ECOLOGICAL RISK ASSESSMENT

Concentrations of a number of contaminants in Canal No. 1 sediment and surface water were elevated relative to conservative screening levels and associated with potential risk to ecological receptors. When conservative assumptions used in the ecological risk assessment are re-evaluated and factors that affect potential exposures, such as quality and size of the habitat and actual use of the site by modeled receptors are considered, the overall level of ecological risk associated with the cited contamination in Canal No. 1 is considered minimal.

Risks to Soil Invertebrates and Plants

Several organochlorine insecticides were detected in surface soil samples. Concentrations tended to be low, and impacts to ecological receptors from these compounds are not expected. Dinoseb was detected in 1 of 10 surface soil samples and was the only herbicide detected at the site. Surface soil toxicity thresholds have not been established for dinoseb, so there is uncertainty regarding its potential impacts. Zinc poses potential risk to plants and invertebrates near sample SS-09. Concentrations of other metals at Site 3 tended to be low and pose negligible potential risks to soil invertebrates and plants.

Risks to Benthic Invertebrates and Aquatic Organisms

Acetone and carbon disulfide were the only VOCs detected in sediment, and acetone was the only VOC detected in surface water. Toxicity data were not available regarding acetone's effects on aquatic and benthic organisms, but acetone concentrations do not appear to be related to Site 3. The potential toxicity of carbon disulfide in sediment cannot be evaluated due to the absence of toxicity thresholds, but it was detected in only 1 of 10 sediment samples.

Several organochlorine insecticides and two PCB compounds were detected in sediment. Most pesticides pose negligible risks to benthic receptors. 4,4'-DDE, 4,4'-DDT, total DDT, and Aroclors (PCBs)

pose potential risks to benthic receptors in the vicinity of sediment samples SD-01, SD-02, SD-04, and SD-05. Concentrations of these COPCs were highest in sample SD-01, which is the upstream-most sample in Canal No. 1.

Total iron concentrations in surface water indicate potential risk to aquatic receptors. Concentrations of other metals tended to be low and pose negligible potential risks to aquatic and benthic organisms, or do not appear to be related to former activities at the landfill.

Risks to Piscivorous Birds and Mammals

Food-chain modeling was conducted to evaluate potential risks to representative piscivorous receptors. Based on maximum sediment and surface water concentrations and conservative assumptions, food-chain hazard quotients (HQs) slightly exceeded 1.0 for Aroclor-1254, Aroclor-1260, total Aroclors, arsenic, copper, and lead. In the average concentration scenario, all food-chain HQs were less than 1.0. Site-related impacts to piscivorous receptors from bioaccumulative COPCs in surface water and sediment are not expected.

E.9 CONCLUSIONS

Contaminants were detected in Site 3 groundwater at concentrations exceeding MDEQ risk-based screening criteria. The CVOC plume is limited to the central portion of the site. Contaminants were also detected in site surface soil exceeding MDEQ risk-based screening criteria for unrestricted site use.

The HHRA identified risk to human receptors (site residents only) exposed to site groundwater exceeding USEPA and MDEQ benchmarks. Estimated risks for site workers, occupational workers, construction/excavation workers, and trespassers/recreational users assumed to be exposed to site media were less than or within USEPA and MDEQ risk benchmarks. The screening-level ecological risk assessment indicated that risk to ecological receptors did not exceed USEPA and MDEQ benchmarks.

The CVOC plume in Site 3 groundwater will require measures to eliminate or minimize exposure by active cleanup, engineering controls, and/or institutional controls.

An arsenic plume was detected in nine wells in the southern portion of the site. The elevated arsenic concentrations occurred upgradient of the landfill and do not appear to be related to waste disposal activities. Elevated iron concentrations were also observed in the majority of the wells with elevated arsenic concentrations.

Based on the results of the RI, a Feasibility Study (FS) using Comprehensive Environmental Response, Compensation, and Liability Act guidelines is recommended for Site 3. As discussed throughout this

report, Site 3 meets the requirements of the presumptive remedy framework for municipal and military landfills. Therefore, the primary remedial strategy for Site 3 will be containment of the disposal area with a soil cap meeting state and USEPA requirements to prevent exposure to site soil.

The containment strategy should focus on three areas: (1) soil cover to prevent direct exposure to landfill materials; (2) elimination of the potential for mechanical disturbance of the cover during golf course operations; and (3) minimization of erosion of surface soil into Canal No. 1.

Based on the locations and types of chemicals detected during this investigation, interim removal or time-critical actions will not be required. After the above actions are taken, there will be a low likelihood for the migration of contaminated media, and the local population will not be exposed to contaminants in subsurface soil and groundwater at the site if current base operations and restrictions are maintained.

The FS will incorporate the presumptive remedy strategy including the soil cover to prevent recontamination in the future. The current soil cover is not likely to be adequate for permanent site closure under either MDEQ or USEPA regulations. Long-term monitoring and maintenance of the soil cover will be required.

1.0 INTRODUCTION

Tetra Tech NUS, Inc. (Tetra Tech) under contract to the United States Department of the Navy, Naval Facilities Engineering Command Southeast, has prepared this Remedial Investigation (RI) Report for Site 3 – Northwest Landfill, Naval Construction Battalion Center (NCBC) Gulfport located in Gulfport, Mississippi under the Comprehensive Long-term Environmental Action Navy IV Contract Number N62467-04-D-0055, Contract Task Order (CTO) 0041. Site 3 – Northwest Landfill is a former landfill located in the northwestern portion of NCBC Gulfport.

1.1 PURPOSE OF REPORT

A broad framework for the RI and selection of the remedy process has been created through the National Oil and Hazardous Substances Pollution Contingency Plan by the United States Environmental Protection Agency (USEPA). The RI process as outlined in Guidance for Conducting Remedial Investigations and Feasibility Studies under Comprehensive environmental Response, Compensation, and Liability Act (CERCLA) (USEPA, 1991a) details the methodology that the Superfund program has established for characterizing the nature and extent of risks posed by uncontrolled hazardous waste sites and for evaluating potential remedial options.

The overall objectives of the RI process are as follows:

- To adequately characterize the nature and extent of contamination at the site.
- To define the site dynamics, including contaminant migration pathways, transportation mechanisms, and potential receptors.
- To determine the site risks to human and ecological receptors.

The USEPA has established the presumptive remedy framework for achieving each of these objectives while at the same time streamlining both the RI and remedy selection processes. Achieving these objectives will provide the basis for a remedy selection that is protective of human health and the environment. The proportion, distribution, and nature of the wastes present at Site 3 fit the parameters for the application of a containment presumptive remedy. Those characteristics are as follows:

- Risks are low-level except for hotspots.
- Waste types are generally household, commercial, nonhazardous sludge, and industrial solid wastes.
- Lesser quantities of hazardous wastes are present as compared to municipal-type wastes.
- Low hazard military-specific wastes (low-level radioactive, decontamination kits, munitions hardware).

High hazard military wastes would preclude the use of presumptive remedy. Those waste types would include munitions, chemical warfare agents, and high-level radioactive wastes.

1.2 PRESUMPTIVE REMEDY PROCESS

Based on historical patterns of remedy selection for common categories of sites, including landfills, the USEPA encourages the use of presumptive remedies (USEPA, 1993f) to increase consistency in remedy selection and to streamline the remedial action process. Prior to preparation of the Site 3 RI Work Plan, it was determined that a presumptive remedy for Site 3 was the best course of action based on the characteristics of the materials in the landfill and low concentrations of contaminants in the surficial aquifer (Harding Lawson Associates [HLA], 1999). Based on the USEPA guidance, a containment remedy involving a soil cover was incorporated into the site strategy to be consistent with USEPA guidance including Presumptive Remedy for CERCLA Municipal Landfills (USEPA, 1993f), amended by the Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills (USEPA, 1996c), and Mississippi Department of Environmental Quality (MDEQ) policy requiring a soil cover (containment) for this category of landfill as outlined in Mississippi Commission on Environmental Quality (MCEQ) Solid Waste Management Regulations (MCEQ, 2005).

1.3 INVESTIGATION USING PRESUMPTIVE REMEDY STRATEGY

The presumptive remedy process for landfills includes a streamlined approach to site characterization based on the remedial actions most likely to be selected. Site characterization for municipal landfills is expedited by focusing primarily on the information needed to sufficiently assess and address risks posed by the site. Therefore, there is less emphasis on extensively characterizing the soil and groundwater within the landfill's disposal area and more of a focus on collecting pertinent data that satisfy the application of a containment presumptive remedy.

Landfill Contents

A complete characterization of the landfill's contents is generally not necessary because containment of the landfill contents does not require such information. However, certain landfill properties, such as vertical and lateral extent of the disposal area, age of the landfill, and disposal patterns can influence the cover type.

Groundwater/Leachate Contamination

The characterization of site geology and hydrology will affect decisions on capping options as well as sampling and potential treatment of groundwater. Precipitation, groundwater-to-surface water recharge rates, and water table fluctuations can influence groundwater contamination plumes and leachate

quantity. This also includes assessing the impact to other potential media such as the surface water and sediment in Canal No. 1 and the surficial aquifer.

Hot Spots

Hot spots consist of highly toxic and/of highly mobile material and present a potential principal threat to human health or the environment. The presumptive remedy encourages the treatment of hot spots when their remediation would significantly reduce the risk posed by the overall site.

Baseline Risk Assessment

A baseline risk assessment was conducted to determine whether Site 3 poses risks to human health and the environment and to demonstrate that the containment presumptive remedy will address pathways and chemicals of concern (COCs).

This streamlined investigative framework is one area where the presumptive remedy methodology differs from the traditional RI approach. The Site 3 RI included sampling in and around the landfill disposal area to ensure that the landfill contents meet the municipal landfill-type waste definition in Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills (USEPA, 1996c).

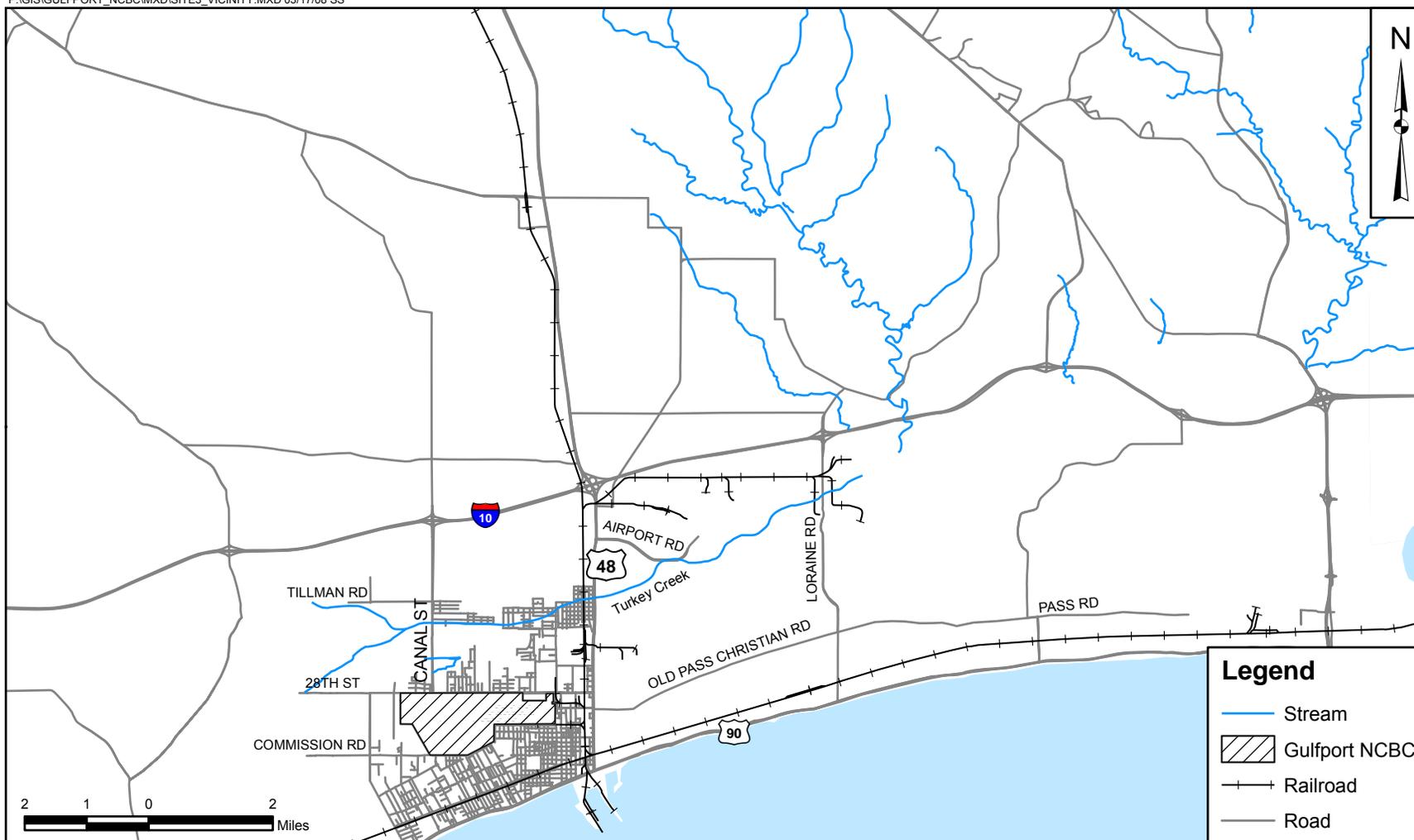
1.4 SITE BACKGROUND

NCBC Gulfport is located in the western portion of Gulfport, Mississippi, in the southeastern portion of Harrison County, about 2 miles north of the Gulf of Mexico (see Figure 1-1). Nine sites at NCBC Gulfport, including Site 3, were identified in the Initial Assessment Study (IAS) as potential threats to human health or the environment (Envirodyne Engineers, 1985). Contamination was first reported in the area designated as Site 3 during the investigation conducted for the Groundwater Monitoring Report in 1995 (HLA, 1999).

1.4.1 Site Description

Site 3 is an approximately 3.5-acre former landfill located in the northwestern section of NCBC Gulfport. The landfill area is located northwest of the intersection of 8th Street and Colby Avenue and is currently used as a portion of the 16th fairway and 18th tee box at the Pine Bayou Golf Course (see Figure 1-2). The eastern boundary of the landfill is adjacent to Canal No. 1. A small pond is located north of the 16th fairway (Golf Course Pond), and a second larger pond is located south of 8th Street and serves as a water source for golf course irrigation.

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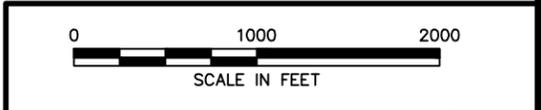
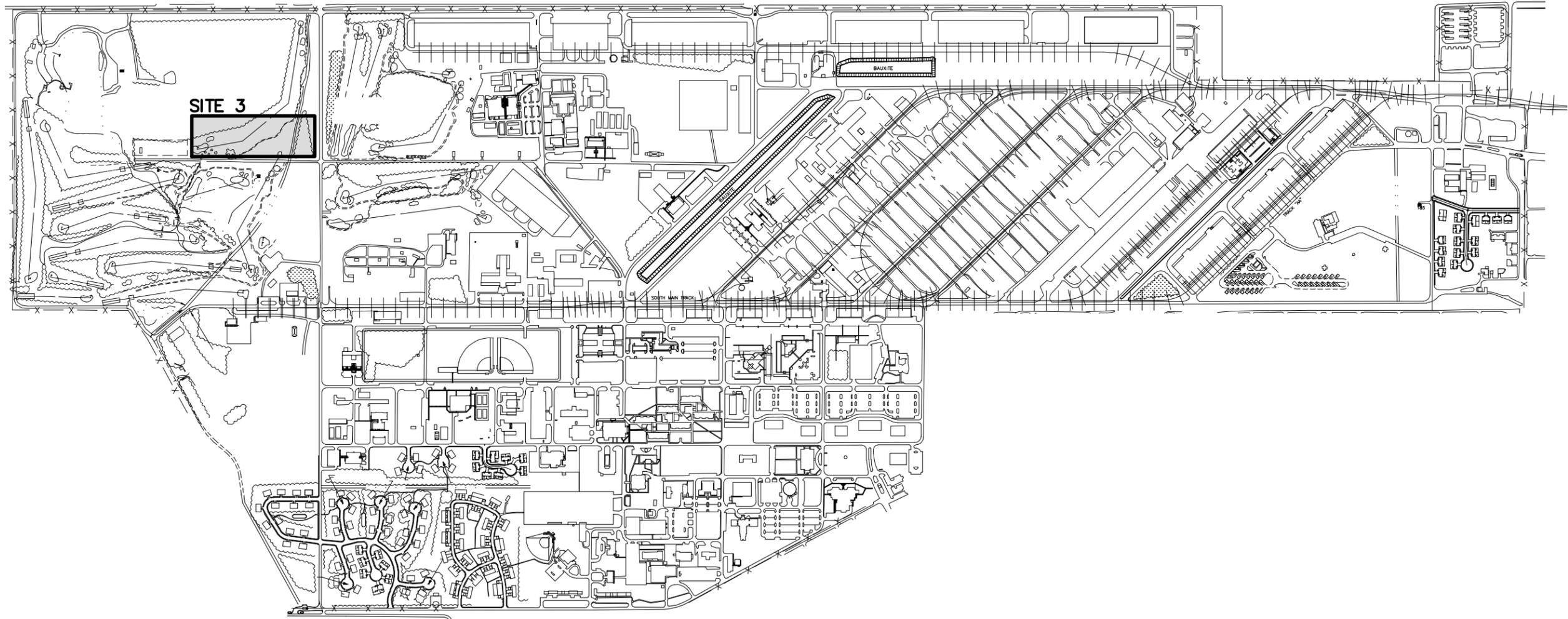
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CHECKED BY J. BOURGEOIS	DATE 03/17/08
COST SCHEDULE AREA	
SCALE AS NOTED	



VICINITY MAP
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

CONTRACT NUMBER 0041	
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. FIGURE 1-1	REV 0

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SCALE AS NOTED		

SITE LOCATION MAP
 SITE 3 REMEDIAL INVESTIGATION REPORT
 NCBC GULFPORT
 GULFPORT, MISSISSIPPI

CONTRACT NO. 0464	
OWNER NO.	
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Canal No. 1 at Site 3 is approximately 30 feet wide and varies in depth from 2 to 4 feet. Storm water runoff from Site 3 flows into various tributary ditches that feed into Canal No. 1. Surface water in Canal No. 1 flows to the north and eventually leaves NCBC Gulfport at Outfall 1 located at 28th Street.

1.4.2 Site History

The Site 3 landfill was in operation from 1948 to 1966. During this time, nearly all of the solid waste and some of the liquid/chemical waste generated at NCBC Gulfport, an estimated 30,000 tons of solid waste (including some additional liquid wastes), were disposed in this landfill. The landfill was a trench-and-fill operation with daily burning of wastes.

A fire-fighting training pit was also suspected to have been located at the site and frequently used from the mid-1950s to 1966. During practice burns, waste liquids were drained into the unlined pit and ignited. Waste fuel, oil, solvents, paint, and paint thinners from the installation were transported to the burning pit in bowsers or 55-gallon drums. An estimated 130,000 gallons of waste liquids were suspected to have been burned at the fire-fighting training pit (Envirodyne Engineers, 1985).

1.4.3 Previous Investigations

The following previous environmental investigations have been conducted at Site 3:

- IAS (Envirodyne Engineers, 1985)
- Verification Report (HLA, 1987)
- Base-wide Groundwater, Surface Water, and Sediment Sampling Program (ABB Environmental Services, Inc. [ABB-ES], 1995)
- Groundwater Monitoring Report investigation (HLA, 1999)
- Pre-Remedial Investigation Evaluation (to support housing environmental assessment) (Tetra Tech, 2006)

These investigations included monitoring well installation, geophysical surveying, and soil, surface water, sediment, and groundwater sampling, but did not completely determine the nature and extent of contamination at the site. These investigations and their findings are summarized below.

IAS – 1985

The first phase of the Navy Assessment and Control of Installation Pollutants (NACIP) Program, the IAS, evaluated the potential threats to human health and the environment (Envirodyne Engineers, 1985) from handling and disposal of wastes at NCBC Gulfport. The IAS included a records search, on-site survey,

Confirmation Study site ranking, and an outline for the Confirmation Study. No samples were collected during the IAS.

Nine potentially contaminated sites were identified based on the records search, site inspections, and interviews with base personnel (active and retired). The IAS recommended that a Confirmation Study be conducted at six sites including Site 3.

Verification Report – 1987

During the second phase of the NACIP Program, the Verification Report (Confirmation Study), each of the six sites identified in the IAS was investigated. The objective was “to determine whether specific toxic and hazardous materials identified in the IAS are present in concentrations considered to be hazardous”.

Following a geophysics survey, three monitoring wells were installed at Site 3. Groundwater samples were collected from the wells, and co-located surface water and sediment samples were collected in the drainage ditch adjacent to 8th Street. All samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, herbicides, and metals. Results indicated no significant chemical contamination; however, only one groundwater sample location was downgradient of the waste disposal area identified in the geophysical survey.

The study was considered inconclusive due to the lack of downgradient groundwater samples. Recommendations included additional groundwater sampling from downgradient locations.

Base-wide Groundwater, Surface Water, and Sediment Sampling Program – 1995

The overall objective of this sampling program was to investigate further groundwater conditions at the six sites identified in the IAS and surface water and sediment quality within the base’s drainage ditches. The data collected were to be used to verify the results of the 1987 Confirmation Study.

The three existing wells were sampled and co-located surface water and sediment samples were collected from Canal No 1 near the 28th Street culvert. All samples were analyzed for VOCs, SVOCs, pesticides/polychlorinated biphenyls (PCBs), inorganics, herbicides, dioxins/furans, and total petroleum hydrocarbons (TPH).

Concentrations of VOCs, SVOCs, and pesticides detected in groundwater were less than their associated MCLs. Herbicides, PCBs, and TPH were not detected in groundwater. Lead and thallium concentrations exceeded their respective Maximum Contaminant Levels (MCLs). Individual dioxin/furan congener detections were low, and 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) was not detected in groundwater. Surface water and sediment sample results were less than screening values.

The recommendation from the 1987 Confirmation Study, sampling of downgradient groundwater locations, was carried forward.

Groundwater Monitoring Report – 1999

Two new groundwater monitoring wells were installed at Site 3 to assess downgradient conditions. Groundwater samples from the wells were analyzed for VOCs, SVOCs, pesticide/PCBs, chlorinated herbicides, and dioxins/furans.

Dioxin concentrations in the new, downgradient Site 3 wells were low. Toxic equivalents of 0.625 part per quadrillion (ppq) and 1.88 ppq were reported in GPT-03-06 and GPT-03-07, respectively. The main congener observed was octa-chlorinated dioxin. Pesticides were detected at levels less than their MCLs. No other contaminants were detected. The results suggested that no significant levels of contamination were migrating off-site via groundwater.

1.4.4 Presumptive Remedy Investigation Objectives

As discussed in Section 1.3, to achieve the objectives of the presumptive remedy RI, the following information was needed:

- Verify the extent of the waste disposal area
- Identify the types of materials disposed
- Determine the extent and sources of mobile contaminants
- Assess potential impact to receptors
- Evaluate risks posed to human health and local ecology

To collect this information, the RI conducted at Site 3 included the following activities as described in Section 2.0:

- Geophysical survey
- Passive soil-gas survey for selected VOCs
- Surface water and sediment sampling
- Direct-push technology (DPT) groundwater screening
- Monitoring well installation
- Groundwater sampling
- Surface and subsurface soil sampling
- Aquifer characterization

1.5 PRELIMINARY RESPONSE ACTION OBJECTIVES

As a first step in evaluating the suitability of containment alternatives, response action objectives were developed. The presumptive remedy response action objectives focus on waste isolation and containment and are as follows:

- Preventing direct contact with landfill contents
- Minimizing infiltration and containment of leaching to groundwater
- Controlling surface water runoff and erosion
- Controlling landfill gas (if necessary)

1.6 REPORT ORGANIZATION

This report consolidates the results of the previous sampling activities summarized above and the RI and includes the following eight sections:

- 1.0 Introduction
- 2.0 Study Area Investigation
- 3.0 Physical Characteristics of the Study Area
- 4.0 Nature and Extent of Contamination
- 5.0 Contaminant Fate and Transport
- 6.0 Human Health Risk Assessment
- 7.0 Screening Level Ecological Risk Assessment
- 8.0 Summary and Conclusions

The following appendices are included with this report:

Appendix A – Soil Gas Survey Reports

Appendix B – Field Data

Appendix C – Validated Laboratory Data

Appendix D – Human Health Risk Assessment Supporting Data

Appendix E – Screening Level Ecological Risk Assessment Food-Chain Modeling

2.0 STUDY AREA INVESTIGATION

This section provides the details of RI activities conducted at Site 3. Data were collected during this RI for the following:

- Determine the extent of the waste disposal area.
- Identify the types of materials disposed of in the landfill and the potential COCs.
- Determine the extent and sources of mobile contaminants in soil and groundwater.
- Assess the potential impact to media including surface water and sediment in Canal No. 1 and the surficial aquifer.

Site 3 RI field activities included the following:

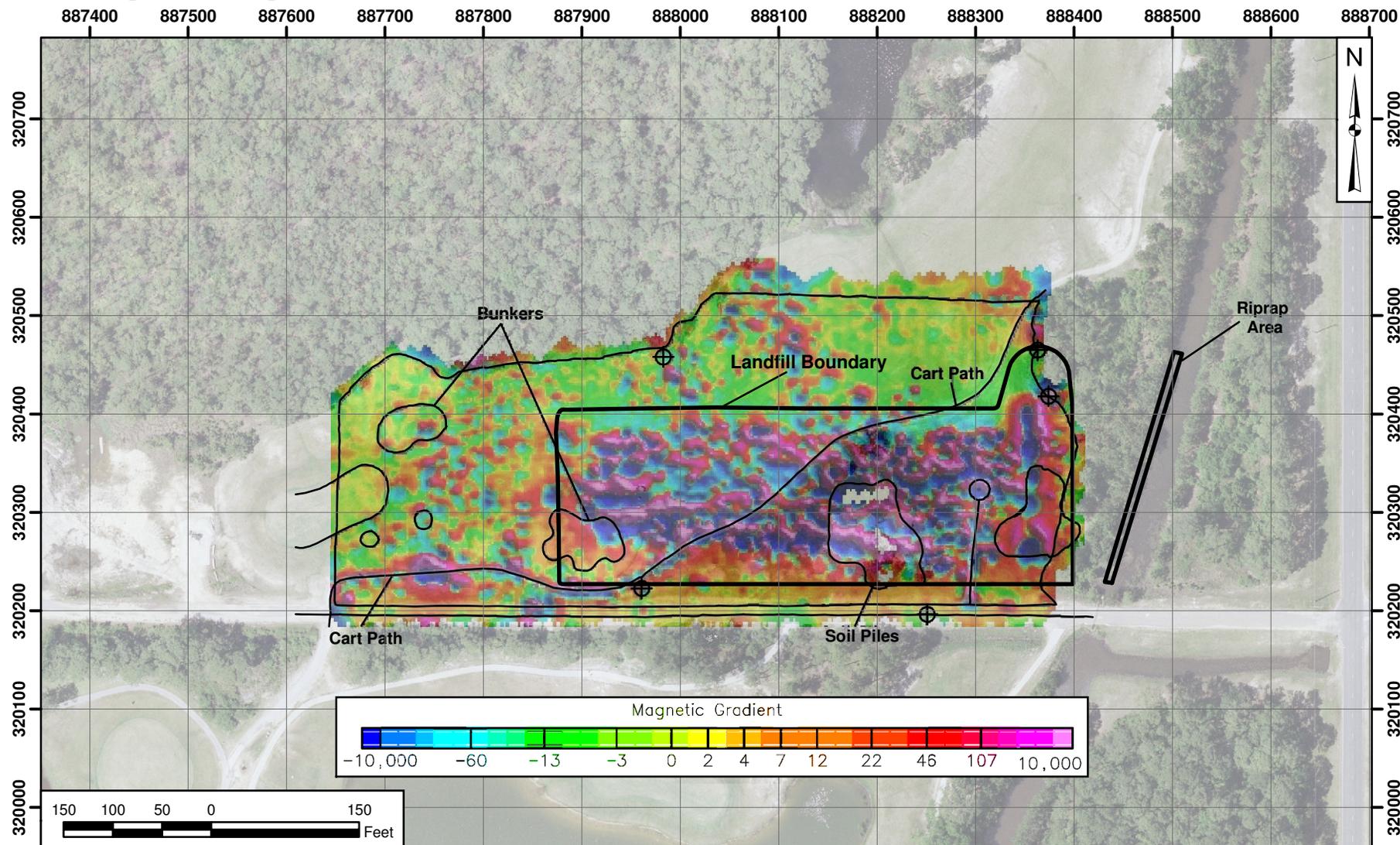
- Geophysical investigation (July 2006)
- Soil-gas survey (July to October 2006)
- DPT groundwater screening (October 2006)
- Surface water and sediment sampling (October 2006)
- Monitoring well installation and sampling (June, July, August, and September 2007)
- Subsurface soil sampling (August 2007)
- Surface soil sampling (August 2007)
- Aquifer characterization (August and October 2007)

The following subsections discuss these activities in detail.

2.1 GEOPHYSICAL INVESTIGATION

An important element of the containment presumptive remedy for landfills is to determine adequately the extent of the disposal area. A geophysical survey was conducted during July 2006 at Site 3 to locate individual disposal cells and to delineate the extent of the landfill. Data from the geophysical survey were used to guide later phases of the investigation.

The geophysical survey was completed using an EM-61 time-domain metal detector and a magnetometer. The magnetometer survey (see Figure 2-1) was performed over a 4-acre area with 20-foot grid node spacing, and the EM-61 survey (see Figure 2-2) was performed over the same 4-acre area with 10-foot grid node spacing. Because the EM-61 antenna is a cart, the part of the 4-acre area that was covered by mounds of soil (indicated on Figure 2-2) was not accessible for the survey. Location information was provided by a differentially corrected global positioning system receiver.

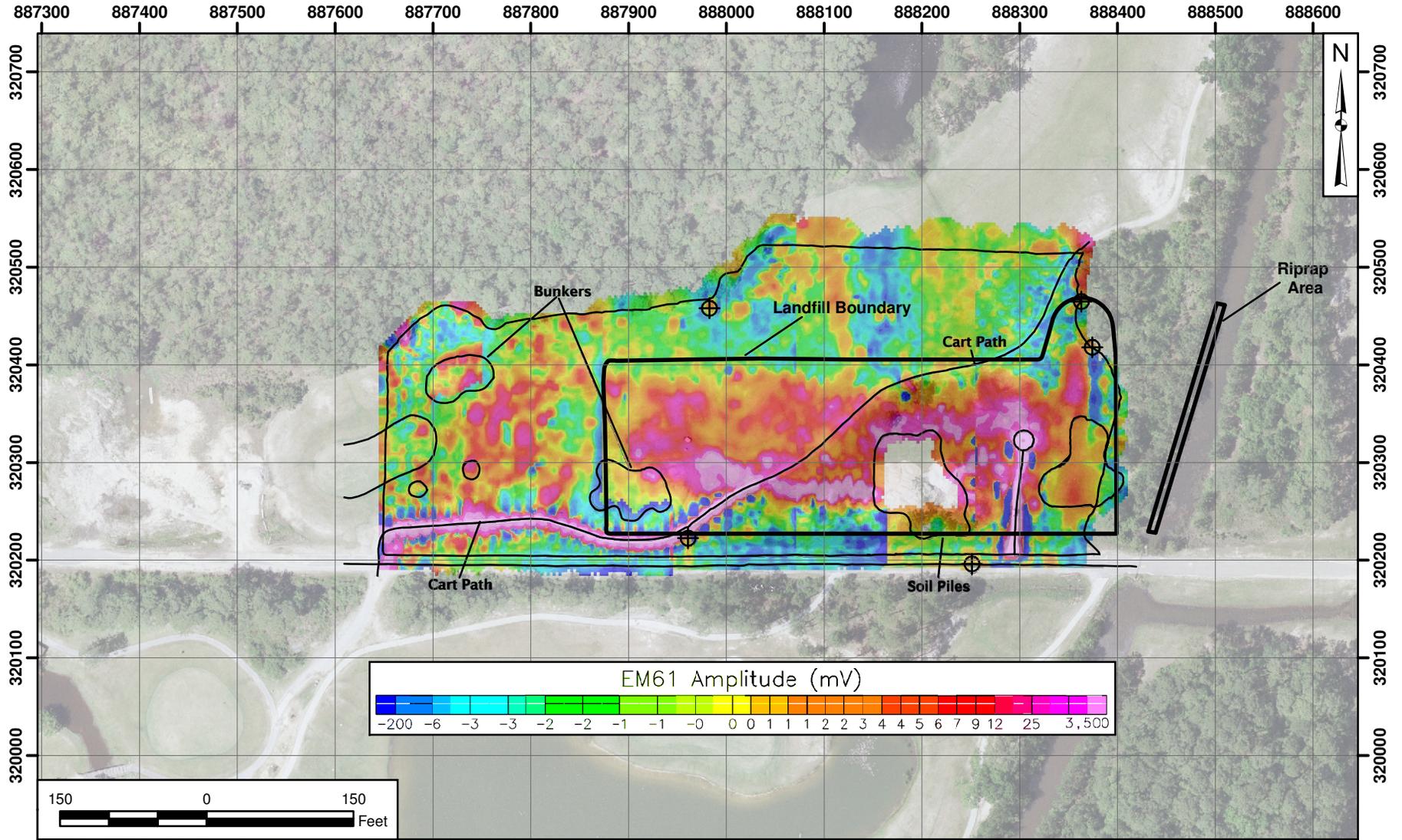


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MAGNETOMETER RESULTS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

CONTRACT NUMBER 0041	
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FIGURE NO. FIGURE 2-1	REV 0



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SCALE AS NOTED	



EM-61 RESULTS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

CONTRACT NUMBER 0041	
APPROVED BY	DATE
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FIGURE NO. FIGURE 2-2	REV 0

2.2 SOIL AND VADOSE ZONE INVESTIGATIONS

The subsurface soil and vadose zone investigations, which included a soil-gas survey and surface and subsurface soil sampling, were implemented with the following objectives:

- Support delineation of the waste area.
- Confirm that landfill contents meet the municipal-type waste definition.
- Determine if landfill gas generation will require a gas collection layer in the landfill cover.
- Perform an existing cover assessment.

The landfill gas assessment and existing cover assessment were conducted to support both the RI and the Feasibility Study (FS).

Passive Soil Gas Survey

The passive soil gas survey was a qualitative study of volatile contaminants in shallow subsurface soil and groundwater. The study was conducted from July 2006 to October 2006, and results were presented to the Navy in April 2007 to support an on-base housing project. The Navy expedited this phase of the RI so that data collected could support the Housing Environmental Assessment (EA) (Tetra Tech, 2006). Passive soil-gas samplers were used to collect media-composite samples from the vadose zone and shallow surficial aquifer. The reports from the soil gas survey are included in Appendix A.

A total of 113 sample modules were placed over a 680-foot by 235-foot grid (see Figure 2-3). Each module was suspended in an open borehole at a depth of 3 feet below land surface (bls). The borehole was created using a 10-amp 3/4-inch drill and a 36-inch bit. The vender (WL Gore) analyzed the samples for benzene, toluene, ethylbenzene, and total xylenes (BTEX); trichloroethene (TCE); dichloroethene (DCE); and TPH.

This assessment was not a complete characterization of gaseous constituents at Site 3; rather the results provided an efficient means of determining hot spots in the study area and supported the subsequent investigative phases of the RI.

Surface Soil Investigation

The surface soil investigation was conducted in August 2007 to determine if the existing surface soil at the site can be integrated into a final cover. Ten sample locations were selected from the landfill disposal area (see Figure 2-4). Field sampling records are included in Appendix B. The sampling locations were placed diagonally across the landfill boundary from the northwestern corner toward the 18th tee box in the southeastern corner. The tee box is expected to be destroyed and the ground surface regraded prior to

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● GORE SAMPLE MODULE LOCATION AND ID

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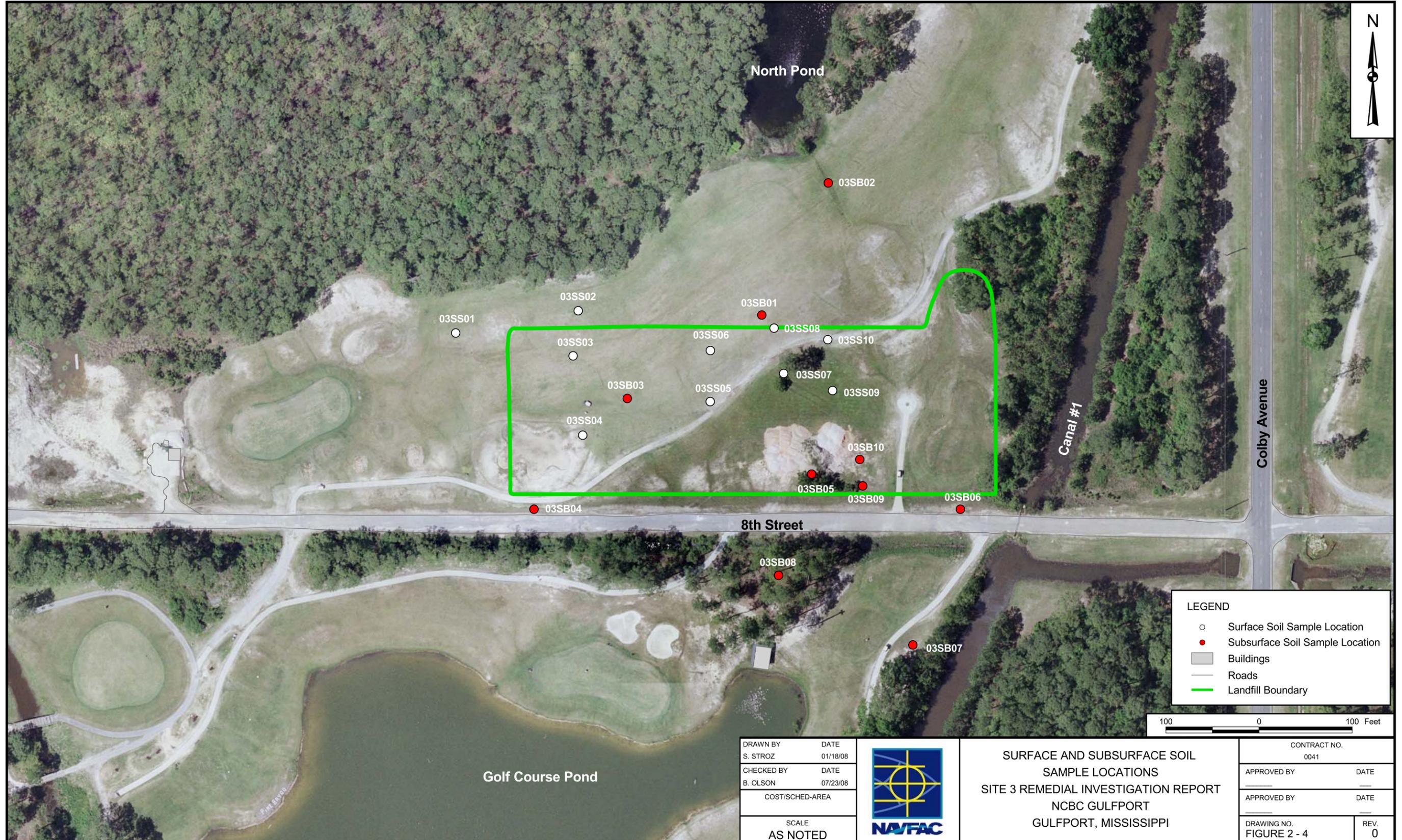
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SAMPLE GRID
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

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DRAWING NO. FIGURE 2-3	REV. 0



construction of the final cover; therefore, no surface soil samples were collected from this area. One surface soil sample was collected from 0 to 1 foot bls at each location.

The surface soil samples were analyzed for target compound list (TCL) VOCs, TCL SVOCs, TCL pesticides and PCBs, Appendix IX chlorinated herbicides, and target analyte list (TAL) inorganics (see Table 2-1). The results of the surface soil investigation are presented in Section 4.2.2. Validated data are included in Appendix C.

Subsurface Soil Investigation

The lateral extent of the waste disposal area was delineated using geophysical methods, and a drilling program was completed to characterize the vertically extent of the landfill material. The subsurface soil study included the collection and analysis of soil samples in August 2007 to verify whether the waste types observed in the disposal area correspond with the reported operating history and the municipal waste definition.

One subsurface soil sample was collected from 3 to 8 feet bls from each of 10 drilling locations (see Figure 2-4). The drilling locations were selected to coincide with the margins of the waste area and provide a cross-sectional characterization of the shallow subsurface across the site. Soil boring logs are included in Appendix B. Groundwater samples were also collected from these 10 boring locations by way of co-located permanent monitoring wells as described in Section 2.3.

Subsurface soil samples collected from the borings were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, Appendix IX chlorinated herbicides, and TAL inorganics (see Table 2-1). The results for the subsurface soil investigation are presented in Section 4.2.3. Validated data are included in Appendix C.

2.3 GROUNDWATER INVESTIGATIONS

Groundwater sampling during the RI included DPT groundwater screening and permanent monitoring well sampling. DPT groundwater sampling was conducted to support the soil-gas study, and monitoring well sampling was conducted to characterize site groundwater conditions. Figure 2-5 includes DPT sample locations, and Figure 2-6 includes monitoring well locations.

**TABLE 2-1
REMEDIAL INVESTIGATION SAMPLING AND ANALYSIS SUMMARY
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

SAMPLE MATRIX	NATURE AND EXTENT ANALYSES					
	TCL VOCs	TCL SVOCs	TCL Pest/PCBs	Appx IX Herbicide	TAL Metals + CN	CVOCs
Soil						
Surface Soil	10	10	10	10	10	
Subsurface Soil	10	10	10	10	10	
Sediment	16	16	16	16	16	
Surface Water	14	14	14	14	14	
Groundwater						
Monitoring Wells	24	24	24	24	24	
DPT - Mobile Lab						81

Notes:

- TCL VOCs Target Compound List volatile organic compounds - Method 8260B
- TCL SVOCs Target Compound List semivolatile organic compounds - Method 8270C
- TCL Pest/PCBs Target Compound List pesticides and polychlorinated biphenyls - Methods 8081A/8082
- Appx IX Herbicide Appendix IX chlorinated herbicides - Method 8151B
- TAL Metals + CN Target Analyte List metals and cyanide - Method 6061B
- CVOCs Chlorinated volatile organic compounds - Method 8260B





2.3.1 DPT Groundwater Screening

A DPT rig and on-site mobile laboratory were mobilized in October 2006 to complete a groundwater investigation following an assessment of the soil-gas modules. A total of 81 groundwater samples from 23 locations (03SB01 through 03SB23) were collected via temporary wells and analyzed on site for selected VOCs using USEPA Method 8260 (see Table 2-1). The study did not continue south of 8th Street due to concerns with unmapped utilities. DPT groundwater sample locations are presented on Figure 2-5.

At each location, a 2-inch-diameter well screen was driven to a selected depth, based on site lithology, and then exposed to a discrete interval of the water-bearing zone. Two to four groundwater samples were collected at the DPT sample locations, depending on the thickness of the lithologic units and rate of groundwater production. The advantages of using DTP drilling were the reduction in investigation-derived waste generation, reduced impact on the golf course, and reduced cost per sample. The rapid sample collection rate also maximized the on-site mobile laboratory's output.

The initial 10 DPT groundwater locations were focused on further characterizing potential hotspots identified during the passive soil-gas study, and subsequent locations were sampled to refine the delineation of the chlorinated VOC (CVOC) plume. Samples were collected at depths ranging from 6 feet to 45 feet bls. The results of the DPT groundwater screening are presented in Section 4.3.1.

2.3.2 Monitoring Well Installation and Sampling

A total of 24 permanent monitoring wells (GPT-03-08 through GPT-03-31) were installed at Site 3 during the RI at locations chosen based on the results of the DPT groundwater investigation (see Table 2-2). Wells GPT-03-08 through GPT-03-17 were installed in June 2007, and GPT-03-18 through GPT-03-31 were installed in August 2007. Wells were installed upgradient and downgradient of the landfill to evaluate potential migration of contamination, and well pairs and clusters were installed to evaluate vertical groundwater gradients. Wells were screened in the shallow and deep zones of the shallow surficial aquifer. Well locations are presented on Figure 2-6.

Monitoring well groundwater samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, Appendix IX chlorinated herbicides, and TAL inorganics. Groundwater quality parameters including pH, conductivity, temperature, dissolved oxygen, and turbidity were measured with field instruments at each monitoring well during sampling activities. The monitoring well groundwater results are presented in 4.3.2. Groundwater sample log sheets are included in Appendix B.

**TABLE 2-2
WELL CONSTRUCTION DETAILS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

	INSTALLATION DATE	TOTAL DEPTH (feet bls)	SCREENED INTERVAL (feet bls)	TOP OF CASING ELEVATION
GPT-03-08	6/26/2007	20	10 - 20	22.52
GPT-03-09	6/27/2007	25	15 - 25	23.09
GPT-03-10	6/27/2007	20	10 - 20	23.29
GPT-03-11	6/27/2007	25	15 - 25	22.68
GPT-03-12	6/28/2007	25	15 - 25	23.63
GPT-03-13	6/28/2007	30	20 - 30	23.08
GPT-03-14	6/28/2007	24	14 - 24	22.99
GPT-03-15	6/29/2007	20	10 - 20	21.99
GPT-03-16	6/29/2007	30	20 - 30	19.96
GPT-03-17	6/29/2007	29	19 - 29	23.46
GPT-03-18	8/14/2007	45	40 - 45	23.65
GPT-03-19	8/14/2007	30	20 - 30	23.89
GPT-03-20	8/14/2007	30	20 - 30	25.54
GPT-03-21	8/15/2007	30	20 - 30	23.18
GPT-03-22	8/15/2007	30	20 - 30	22.53
GPT-03-23	8/15/2007	30	20 - 30	21.49
GPT-03-24	8/15/2007	35	25 - 35	21.44
GPT-03-25	8/15/2007	43	37.5 - 42.5	21.25
GPT-03-26	8/16/2007	19	9 - 19	20.34
GPT-03-27	8/16/2007	35	30 - 35	20.99
GPT-03-28	8/16/2007	39	34 - 39	23.14
GPT-03-29	8/16/2007	30	20 - 30	23.46
GPT-03-30	8/16/2007	39	34 - 39	23.50
GPT-03-31	8/16/2007	50	40 - 50	22.34

Notes:

bls - below land surface

Top of casing elevations in feet above mean sea level

Monitoring wells GPT-03-08 through GPT-03-17 were installed using hollow stem auger (HSA) methods, and wells GPT-03-18 through GPT-03-31 were installed using DPT methods. The HSA wells were constructed of 2-inch-diameter, Schedule 40 polyvinyl chloride (PVC) flush-threaded casing with 10-foot, 0.01-inch slotted, PVC, pre-packed screens. The shallow HSA wells (GPT-03-8 through GPT-03-12) were installed to total depths of 20 or 25 feet bls. Deeper monitoring wells were installed to a total depth of 40 feet (GPT-03-14) and 45 feet (GPT-03-15) bls. At each well, a filter pack of clean, 20/40, silica sand was installed from the bottom of the borehole to 2 feet above the top of the screen. A 4-foot-thick bentonite pellet seal was installed above the 20/40 sand filter pack. The remainder of the annulus of the borehole was grouted with cement/bentonite slurry. The DPT wells were constructed of 1-inch-diameter, Schedule 40 PVC flush-threaded casing with 5 or 10-foot, 0.01-inch slotted, PVC, pre-packed screens. The shallow DPT wells (GPT-03-19, GPT-03-2, GPT-03-21, and GPT-03-26) were installed to total depths of 30 feet bls. Deeper DPT wells were installed to total depths between 35 feet (GPT-03-27) and 50 feet (GPT-03-31) bls. At each well, a 4-foot-thick bentonite pellet seal was installed above the pre-packed screen. The remainder of the annulus of the borehole was grouted with cement/bentonite slurry.

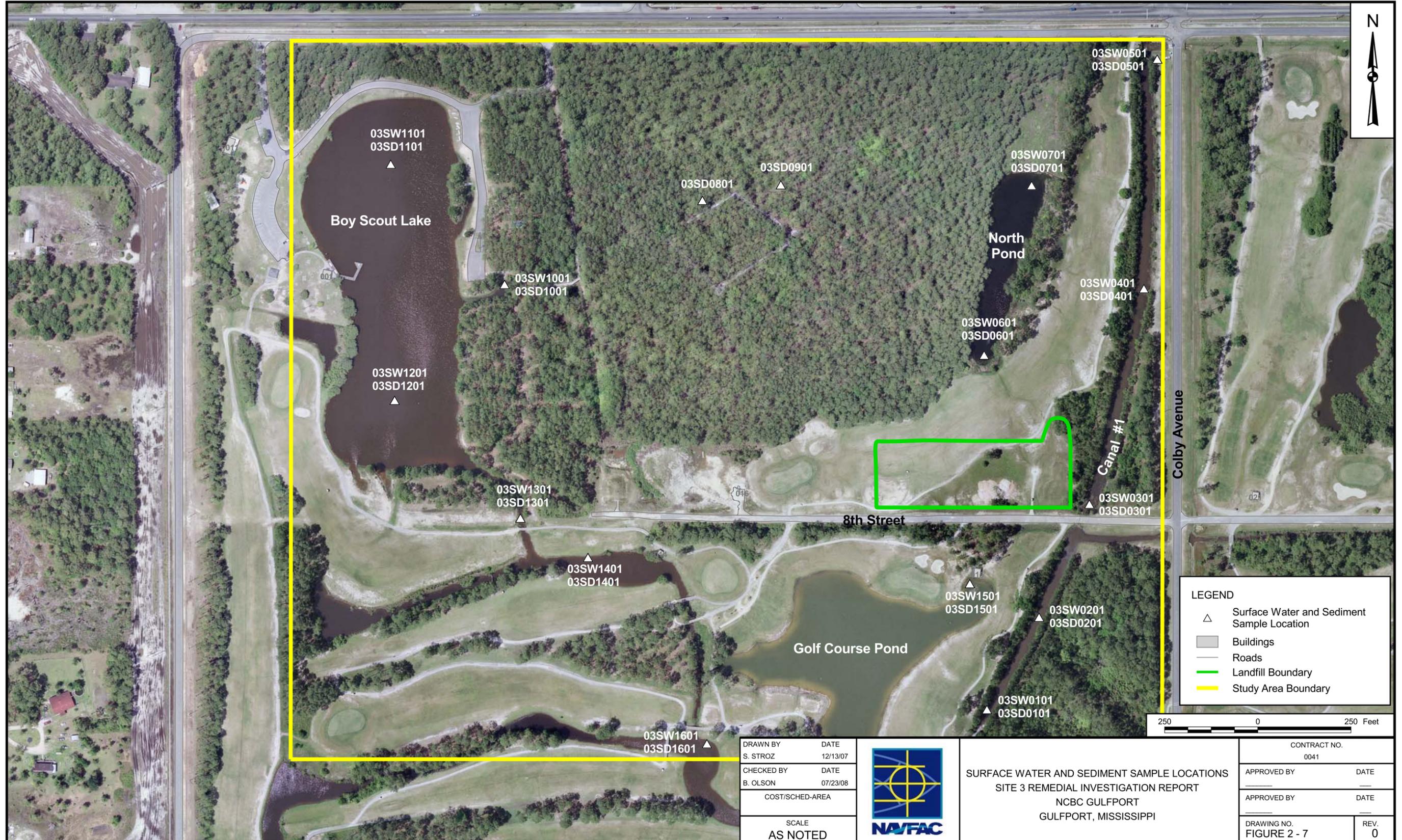
The monitoring wells were completed at ground surface with flush-mount vaults, as specified in the Southern Division Specifications for Monitoring Well Completion and Abandonment (Naval Facilities Engineering Service Center [NFESC], 1999). The horizontal location and top of casing elevation for each new monitoring well was surveyed by a Mississippi-licensed professional land surveyor. Monitoring well construction details are summarized in Table 2-2.

2.4 SURFACE WATER AND SEDIMENT INVESTIGATION

Surface water and sediment samples collected during the RI were distributed over a wide area, in large part to support the Housing EA (see Figure 2-7). The data collected were used to characterize the general water quality in three nearby surface water bodies (Canal No. 1, North Pond, and Golf Course Pond) and a wetland to the northwest of Site 3. In addition, downgradient samples were collected from the Pine Bayou Golf Course surface water drainage system downgradient of the Golf Course Pond and in Boy Scout Pond.

Surface water and sediment samples were collected from Canal No. 1 adjacent to Site 3 to evaluate conditions in the canal as well as upgradient and downgradient. Surface water samples were collected at 14 locations (see Figure 2-7). Sediment samples were collected at 16 locations (see Figure 2-7).

The surface water and sediment samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, Appendix IX chlorinated herbicides, and TAL inorganics. Surface water and sediment results are presented in Section 4.4. Surface water and sediment sample log sheets are included in Appendix B.



2.5 AQUIFER CHARACTERIZATION

Rounds of static water level (SWL) measurement data were recorded from Site 3 in August and October 2007. The SWL measurement data and top of casing elevations were used to determine groundwater elevations at site monitoring wells. The groundwater elevations were used to determine flow direction and horizontal and vertical gradients at each site.

Slug tests were conducted in three shallow wells and two deeper wells at Site 3. Each test was performed by displacing a volume of water with a PVC rod of known volume and recording the recharge rate of the water level. Rising head (slug out) tests were conducted in each well. Calculations were performed using the AqtesolvTM aquifer characterization program. The Bouwer and Rice solution was calculated for each of the slug tests. Slug test analytical curves used to determine hydraulic conductivity are included in Appendix B.

3.0 PHYSICAL CHARACTERISTICS OF THE STUDY AREA

NCBC Gulfport is located in the western part of the City of Gulfport, Mississippi, in southeastern Harrison County, about 2 miles north of the Gulf of Mexico. NCBC Gulfport occupies approximately 1,100 acres and has an average elevation of approximately 30 feet above sea level.

3.1 SURFACE FEATURES

The former disposal area at Site 3 is located on the 16th and 18th holes of the Pine Bayou Golf Course. The majority of the site is located on the fairway of the 16th hole, and the eastern end of the disposal area is adjacent to the tee box of the 18th hole. The site is bordered on all sides by facilities of the Pine Bayou Golf Course. Large trees are present on the eastern side of the disposal area adjacent to Canal No. 1. The site topography is relatively flat on both sides of 8th Street, with elevations of approximately 20 to 24 feet above mean sea level on the northern side and approximately 23 feet on the southern side.

Canal No. 1, the primary drainage feature that drains the western portion of the base, is approximately 75 feet east of the disposal area. At Site 3, Canal No. 1 is approximately 4 feet deep and 35 feet wide.

8th Street, on the southern side of disposal area, acts as drainage barrier for surface water runoff, separating the areas north and south of the road. The ditches and shallow swales along both sides of the road direct surface water flow to Canal No. 1 to the east.

3.2 METEOROLOGY

The Gulfport area has a mild climate with warm and humid summers (average temperature of 82 degrees Fahrenheit [°F]) and mild winters (average temperature of 52 °F). The mean annual precipitation is 63.5 inches, and individual storms are often intense and may produce large 24-hour precipitation totals. The Mississippi coast is subject to hurricanes between June 1 and November 30.

3.3 SURFACE WATER HYDROLOGY

NCBC Gulfport is located in the Gulf Coast Flatwoods Region, which extends along the southern coast of Harrison County. This area is typically drained by small streams flowing southeastward toward the coast. Topography in this area is a series of wet, poorly drained depressions between better-drained areas of slightly higher elevation.

Surface water near NCBC Gulfport is abundant. Storm water runoff is collected in a series of ditches and canals and directed off base. Large precipitation events tend to produce small stream and ditch flooding due to relatively high stream flow velocities.

The area of the landfill is contained in a roughly triangular surface drainage basin controlled by a topographic high roughly coincident with the centerline of the 16th fairway to the northwest, an elevated tee box (18th) and wooded area to the east between the landfill and Canal No. 1, and 8th Street to the south. A drainage swale and ditch on the northern side of 8th Street receives the majority of surface water runoff from the disposal area and discharges to Canal No. 1 on the northern side of 8th Street.

Three surface water bodies adjacent to Site 3 (Canal No. 1, Golf Course Pond, and North Pond) have the potential to receive surface water runoff from the site and have an influence on the hydrology of the surficial aquifer. Golf Course Pond and North Pond were excavated after 1972, after landfill operations (1948 to mid-1960s) had ceased at Site 3.

3.3.1 Canal No. 1

At Site 3, Canal No. 1 is located near the eastern boundary of the site and is the primary drainage ditch for the western portion of the base (see Figure 1-2). Canal No. 1 is a perennial stream that flows north past Site 3 and exits the base at Outfall 1. Canal No. 1 is part of the Turkey Creek drainage basin and continues north from the base along Canal Road until it joins Turkey Creek (see Figure 1-1). From there, surface water is conveyed east until it enters Gulfport Lake and the Back Bay of Biloxi.

As part of a base-wide groundwater monitoring investigation (HLA, 1999), a hydrologic monitoring station was installed at Site 4, approximately 750 feet south of Site 3, to collect data for evaluating the interaction of site groundwater and surface water in Canal No. 1. Water level data were recorded from Canal No. 1 and a piezometer installed adjacent to the canal, and a rainfall gauge recorded precipitation data. The hydrologic station was operating from November 1998 to May 1999. The results of the hydrologic monitoring (as reported in HLA, 1999) are summarized as follows:

- Water levels in the piezometer were typically 2.5 feet higher than water levels in the canal during the monitoring period (winter and spring).
- Groundwater and surface water levels were highest in November and decreased overall through the monitoring period.
- Both surface water and groundwater levels responded quickly to precipitation events.

- The magnitude of water level change in the piezometer was one-fourth of the change in surface water level during precipitation events.
- Surface water levels recovered within hours of precipitation events, and groundwater recovery took up to 1 week.

These data indicate that groundwater from the shallow surficial aquifer and surface water from Canal No. 1 form a closely linked system and that groundwater can discharge to Canal No. 1 during most of the year. As a gaining stream, Canal No. 1 is considered a potential groundwater-to-surface water pathway. At times of high precipitation, surface water from Canal No. 1 can enter the swales and ditches adjacent to 8th Street and flood low-lying areas.

3.3.2 North Pond

North Pond, located 150 feet north of the Site 3 disposal area, is approximately 550 feet long north to south, 150 feet wide at its northern end, and 100 feet wide at its southern end. The pond was excavated after 1972 and was not present during landfill activities at Site 3. North Pond receives surface water from parts of the golf course north of the Site 3 disposal area.

3.3.3 Golf Course Pond

The Golf Course Pond, located south of 8th Street, is irregularly shaped, with an area of approximately 5 acres. The pond was excavated after 1972 and used as the water supply for the golf course irrigation system. The Golf Course Pond has no outlets or inlets to Canal No. 1, but is connected by a ditch to Boy Scout Pond to the northwest. Recharge of the Golf Course Pond is by surface water runoff from the pond basin and possibly groundwater from west and south of the pond. This pond does not receive surface water runoff from the disposal area at Site 3 because the area between the pond and the disposal area is at a higher elevation (greater than 23 feet) than the ground surface in the disposal area (less than 23 feet).

3.4 GEOLOGY

Data collected from soil borings advanced at Site 3 were used to evaluate the lithologic and stratigraphic conditions that may influence contaminant fate and transport at the site.

3.4.1 Site Stratigraphy

Surface and shallow subsurface soils in the Site 3 area are primarily gray and brown sand to sandy clay with varying amounts of gravel and minor clay horizons. The uppermost 2 feet in most areas is fill

material used in the construction of the golf course over the landfill. Landfill material and black soil horizons were observed from 4 to 8 feet bls at soil boring locations advanced in the landfill area. Below the landfill material, typical lithologies are light brown and gray fine sands and silty fine sands, typical of Pleistocene and Recent terrace and stream valley deposits and white and orange fine sands typical of the Citronelle Formation. Some horizons contain stringers of fine, subrounded, quartz gravel or shell fragments to depths of up to 20 feet. The top of a gray silty clay and clay unit is encountered at depths of approximately 15 to 20 feet, depending on site topography. This clay-rich layer is persistent across the site, with thicknesses ranging from 15 to 20 feet, and represents the transition to the underlying Graham Ferry member of the Pensacola Formation (in the usage of Otvos, 1994).

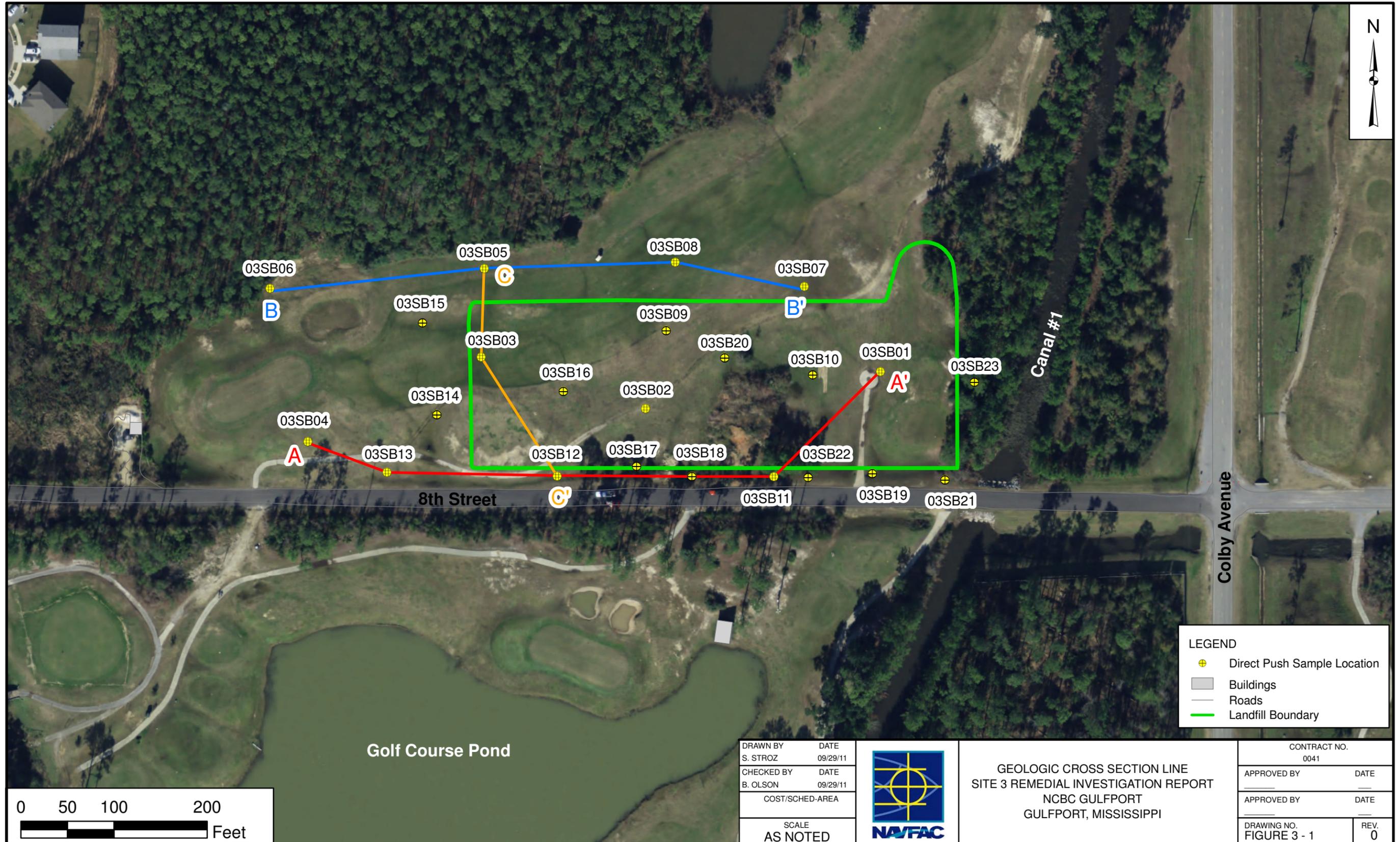
Below the gray clayey sand layer, gray silty sand, and sand lithologies are present at depths ranging from 35 to 40 feet. This sand unit is 5 to 10 feet thick over most of the site but pinches out and is absent at the eastern end of the site.

At approximately 45 feet bls, a much more plastic green-gray clayey silt layer was encountered. This layer is the first definitive unit of the Graham Ferry and is persistent across the site and, based on other sites investigated at NCBC Gulfport (HLA, 1999), ranges from 10 to over 50 feet thick. At the eastern end of the site, where the gray sand unit pinches out, the green-gray silt layer was found at a depth of 35 feet and was in direct contact with the overlying gray clayey sand unit. This layer may represent an aquitard that separates the shallow surficial aquifer from deeper water-bearing units. Figure 3-1 is a site plan showing the lines of cross sections for Figure 3-2 (east/west at the southern part of the site), Figure 3-3 (east/west at the northern part of the site), and Figure 3-4 (north/south).

3.4.2 Regional Geology

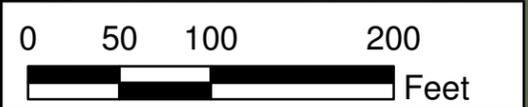
NCBC Gulfport is located in the coastal plain of southern Mississippi, which is underlain by a series of estuarine or deltaic sediments that dip southwestward toward the delta of the Mississippi River (Shows, 1970). These sediments range in age from Miocene to Recent and are not readily separated into stratigraphic units. The uppermost beds are Pleistocene and Recent terrace and stream valley deposits. The uppermost stratigraphic formation in the coastal plain area is the Pamlico Sand. The Pamlico Sand formation is approximately 60 to 70 feet thick and is composed of fine silt, sands, and shale or clay. The Pamlico Sand is underlain by the following formations:

- Citronelle Formation (youngest), approximately 100 feet thick.
- Graham Ferry Formation, alternating layers of sand, shale, and clay ranging from 125 to 250 feet thick.
- Upper and Lower Pascagoula Formations (oldest), alternating layers of sand, shale, and clay with shell and boulders approximately 1,100 feet thick.



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- + Direct Push Sample Location
- Buildings
- Roads
- Landfill Boundary

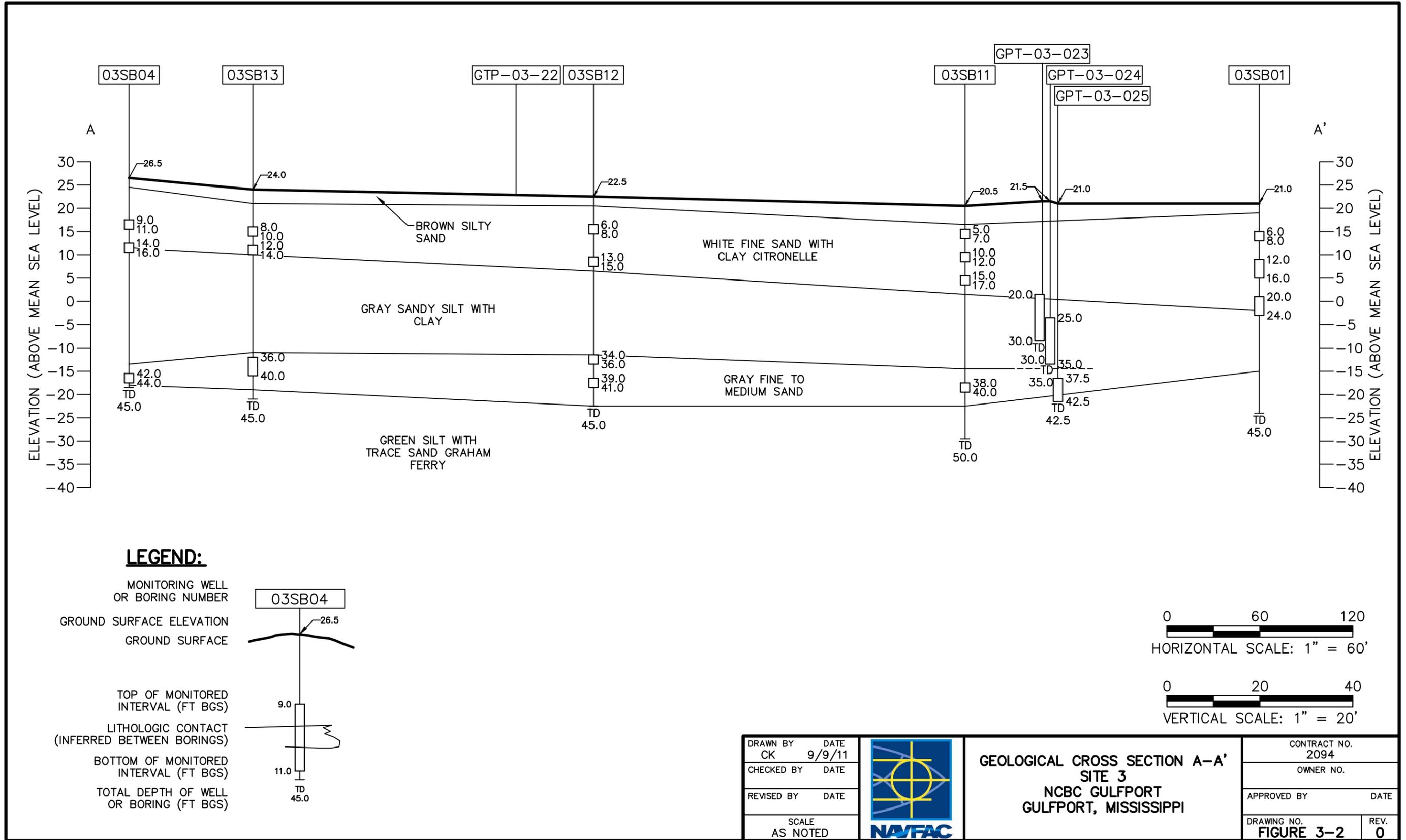


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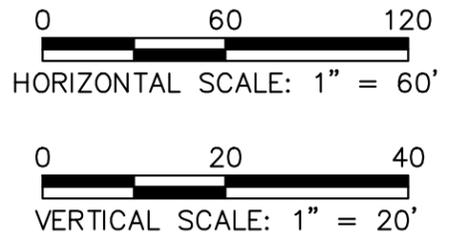
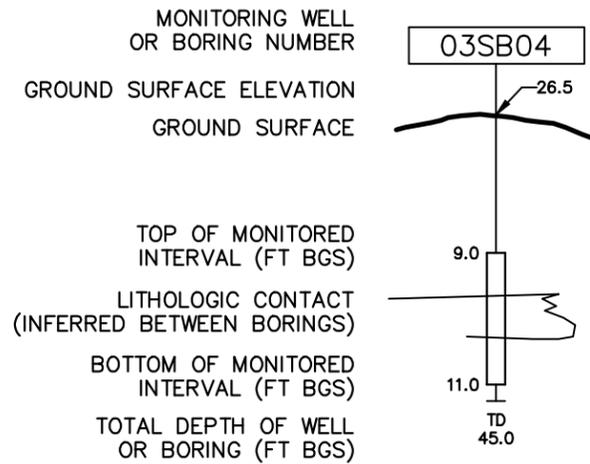


GEOLOGIC CROSS SECTION LINE
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

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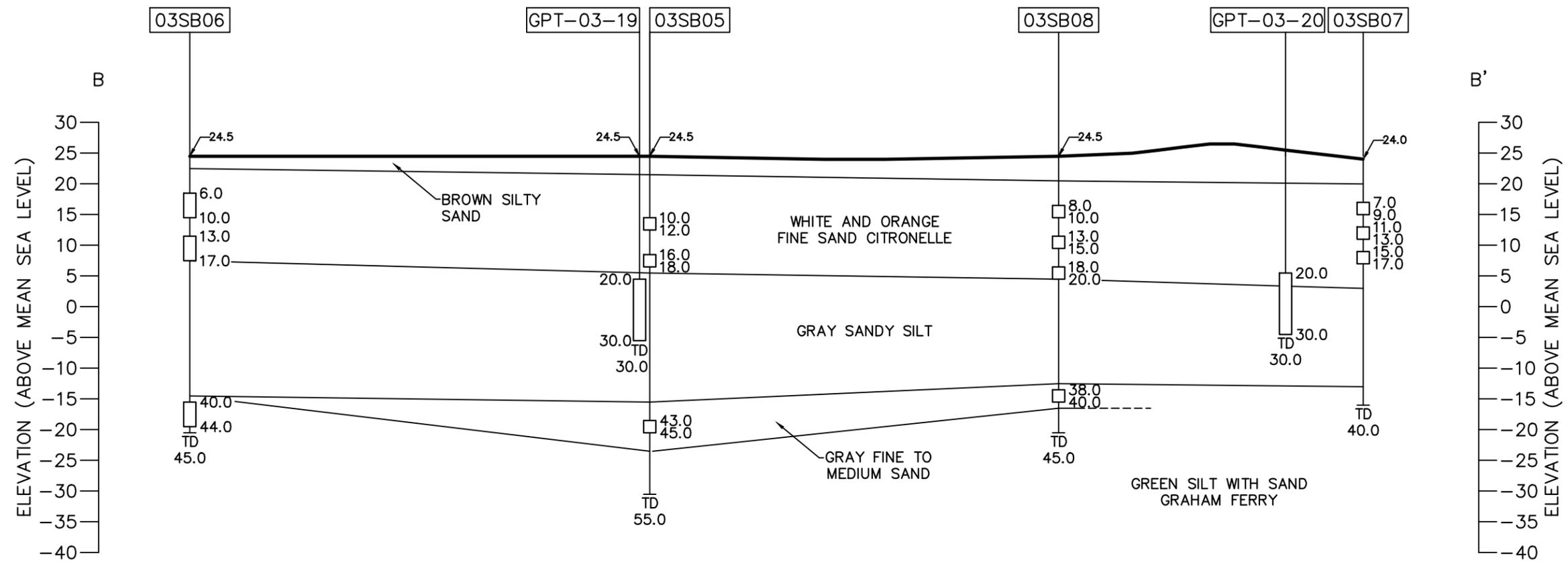


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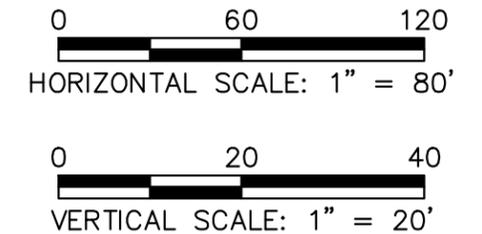
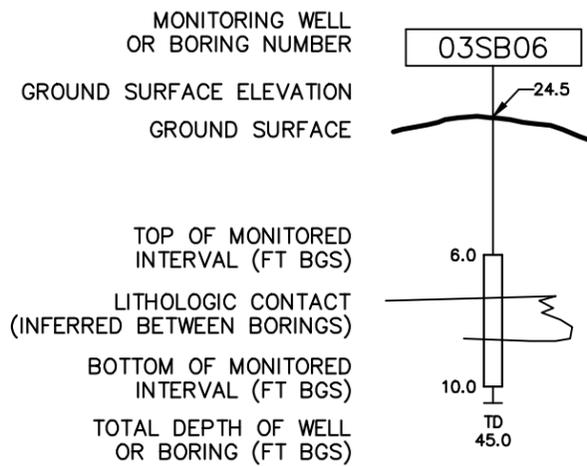


GEOLOGICAL CROSS SECTION A-A'
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NCBC GULFPORT
GULFPORT, MISSISSIPPI

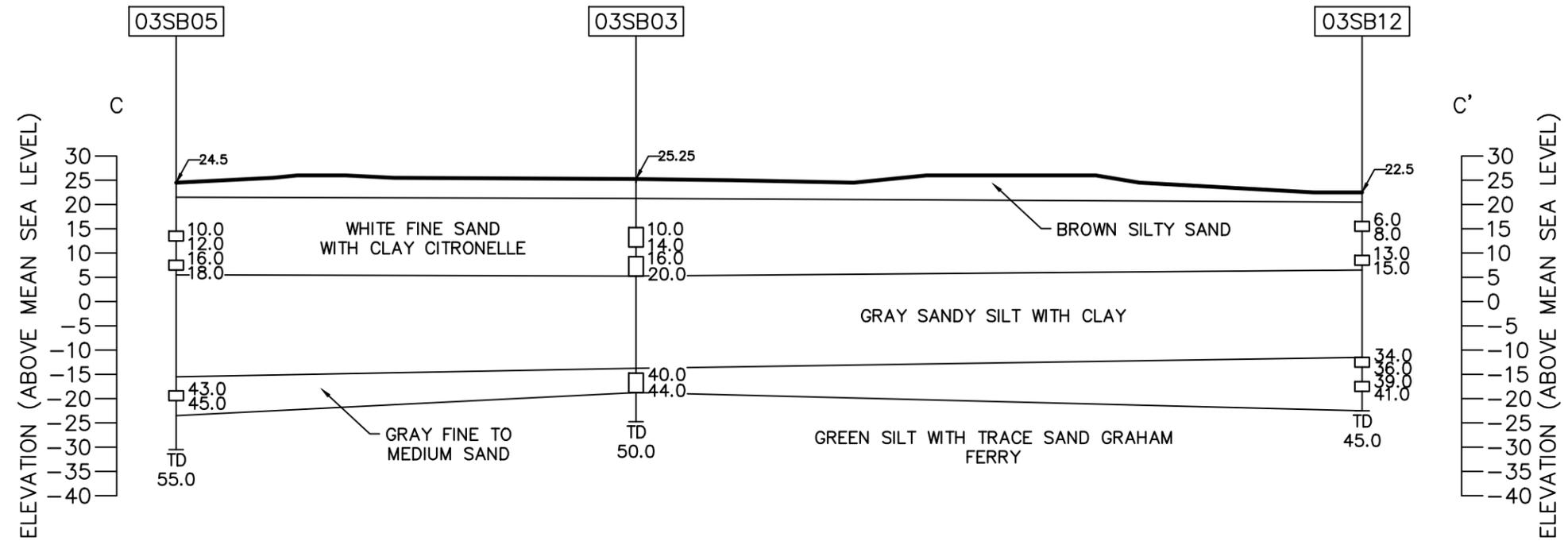
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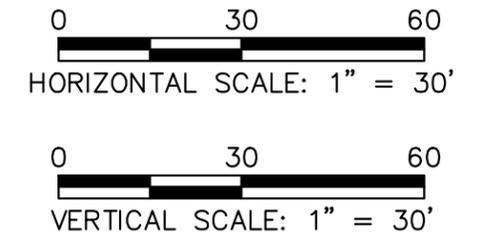
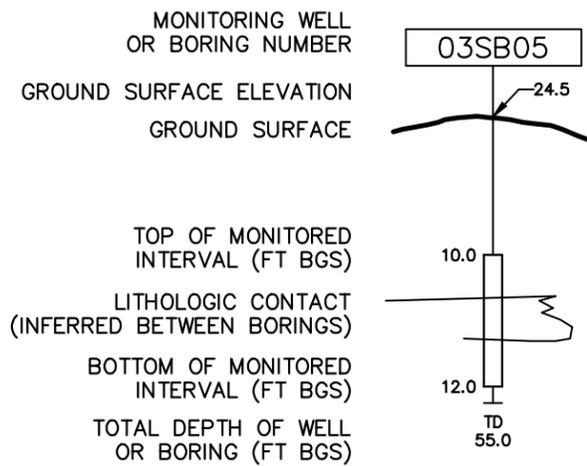
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SCALE AS NOTED			DRAWING NO. FIGURE 3-3		REV. 0	



LEGEND:



DRAWN BY CK	DATE 9/9/11		GEOLOGICAL CROSS SECTION C-C'		CONTRACT NO. 2094
CHECKED BY	DATE		SITE 3 NCBC GULFPORT GULFPORT, MISSISSIPPI		OWNER NO.
REVISED BY	DATE		APPROVED BY	DATE	DRAWING NO. FIGURE 3-4
SCALE AS NOTED					REV. 0

3.5 SOILS

Surface and shallow subsurface soils identified from soil borings at Site 3 are primarily sand and silty sand with minor clay horizons. Native soils typically begin at depths of 3 to 5 feet depending on topography. Landfill debris was typically encountered at depths ranging from \pm 0.4 in the waste disposal area (e.g., 03SB02) (see Figure 2-3).

The Soil Survey of Harrison County (United States Department of Agriculture [USDA], 1975) identifies the soil type in the developed areas of Site 3 where landfill operations occurred as Harleston fine sandy loam with 0 to 2 percent slopes, a moderately well-drained soil developed in loamy material and commonly found on uplands. This soil type is typically sandy loam and fine sandy loam and is strongly acid to very strongly acid. Permeability is moderate, available water capacity is medium, and runoff is slow.

The soil type in the forested areas of Site 3 north and east of where landfill operations occurred is Plummer loamy sand, a poorly drained soil commonly found on wet flats and drainageways. This soil type is typically loamy sand and sandy loam and is strongly acid to very strongly acid. Permeability is rapid in upper horizons and moderate in the subsoil, available water capacity is low, and runoff is slow or very slow.

3.6 HYDROGEOLOGY

Hydrogeologic data were collected to evaluate movement of groundwater in the shallow surficial aquifer at the site. The lithologies at Site 3 are consistent with the typical surficial aquifer of the Mississippi Coastal Plain, composed of undifferentiated alluvium and Pamlico Sand terrace deposits (Recent to Pleistocene in age). The Pamlico Sand formation is approximately 60 to 70 feet thick and is composed of fine sands and shale or clay.

Depth to groundwater and groundwater elevation data were used to determine the site-specific groundwater flow direction and water table gradient. Groundwater flow velocity at the site was estimated using hydraulic conductivity values determined for selected site monitoring wells and hydraulic gradient data.

3.6.1 Static Water Level and Groundwater Elevations

The depth to groundwater at NCBC Gulfport ranges from approximately 2 to 10 feet and is controlled primarily by surface topography. SWL measurement data were recorded from Site 3 monitoring wells in August and October 2007 (see Table 3-1). In October, surface water levels were also measured at three staff gauges installed during September 2007 in Canal No. 1, Golf Course Pond, and North Pond.

TABLE 3-1
WATER LEVEL MEASUREMENT SUMMARY
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

MONITORING WELL ID	AQUIFER ZONE	TOP-OF-CASING ELEVATION	8/21/2007		10/30/2007	
			DEPTH TO WATER	GROUNDWATER ELEVATION	DEPTH TO WATER	GROUNDWATER ELEVATION
GPT-03-15	Shallow	21.99	3.88	18.11	3.64	18.35
GPT-03-27	Shallow	20.99	1.87	19.12	1.43	19.56
GPT-03-26	Shallow	20.34	2.26	18.08	1.97	18.37
GPT-03-16	Shallow	19.96	1.71	18.25	1.13	18.83
GPT-03-23	Shallow	21.49	3.13	18.36	2.37	19.12
GPT-03-24	Shallow	21.44	2.15	19.29	1.76	19.68
GPT-03-25	Deep	21.25	2.02	19.23	1.52	19.73
GPT-03-06	Shallow	22.40	NA	NA	3.05	19.35
GPT-03-20	Shallow	25.54	6.80	18.74	5.76	19.78
GPT-03-18	Deep	23.46	4.25	19.21	3.42	20.04
GPT-03-17	Shallow	23.65	4.75	18.90	3.63	20.02
GPT-03-07	Shallow	23.38	NA	NA	2.71	20.67
GPT-03-19	Shallow	23.89	4.52	19.37	2.87	21.02
GPT-03-21	Shallow	23.18	5.21	17.97	2.99	20.19
GPT-03-04	Shallow	22.02	NA	NA	1.74	20.28
GPT-03-22	Shallow	22.53	4.19	18.34	2.23	20.30
GPT-03-08	Shallow	22.52	3.21	19.31	1.60	20.92
GPT-03-09	Shallow	23.09	3.99	19.10	2.49	20.60
GPT-03-11	Shallow	22.68	3.63	19.05	1.99	20.69
GPT-03-31	Deep	22.34	3.04	19.30	2.56	19.78
GPT-03-10	Shallow	23.29	4.37	18.92	3.07	20.22
GPT-03-12	Shallow	23.63	4.87	18.76	3.53	20.10
GPT-03-14	Shallow	22.99	4.63	18.36	4.12	18.87
GPT-03-13	Shallow	23.08	4.97	18.11	4.72	18.36
GPT-03-28	Deep	23.14	3.89	19.25	3.43	19.71
GPT-03-29	Shallow	23.46	5.09	18.37	4.23	19.23
GPT-03-30	Deep	23.50	4.21	19.29	3.76	19.74
Canal 1	NA					17.77
North Pond	NA					22.54
Golf Course Pond	NA					20.90

Notes:
Elevations referenced to feet above mean sea level
Depths in feet below top-of-casing

The top of casing elevations of the monitoring wells and the tops of the staff gauges were surveyed by professional land surveyors. The SWL measurement data and top of casing elevations were used to determine groundwater elevations at site wells. Surface water levels were read from the scales on the staff gauges.

In August 2007, SWL measurements in shallow wells (total depth less than 30 feet) ranged from 1.71 feet in GPT-03-16, located in a topographic low on the northern side of 8th Street, to 6.80 feet below top of casing (BTOC) in GPT-03-20, located in an elevated area on the 16th fairway. Groundwater elevations in shallow wells ranged from 18.08 feet in GPT-03-26, located adjacent to Canal No. 1, to 19.37 feet in GPT-03-19, located on the northwestern side of the 16th fairway.

In October 2007, SWL measurements in shallow wells ranged from 1.13 feet BTOC in GPT-03-16 to 5.76 feet BTOC in GPT-03-20. Groundwater elevations in shallow wells ranged from 18.35 feet in GPT-03-15, located east of Canal No. 1, to 21.02 feet in GPT-03-19.

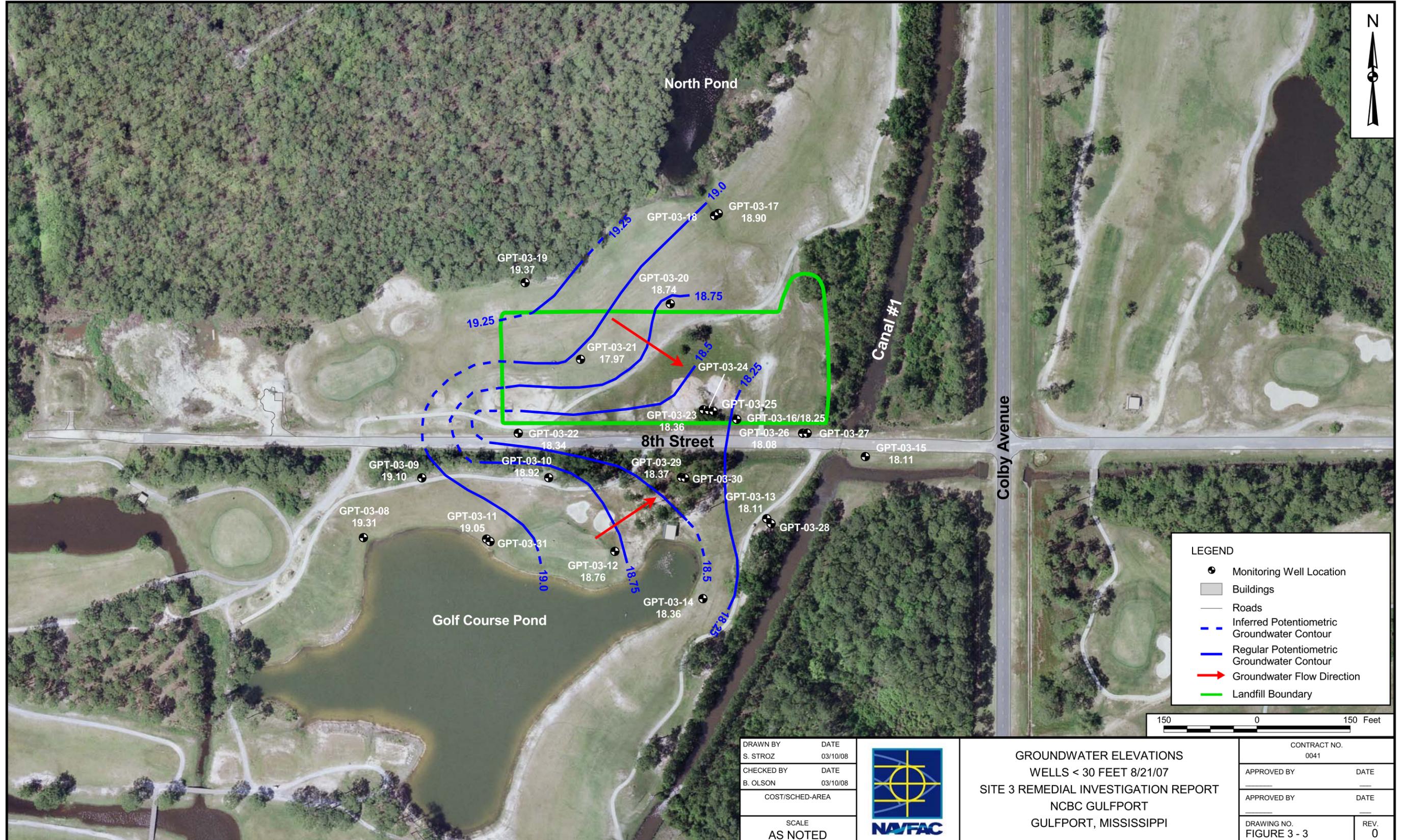
In August 2007, SWL measurements in deep wells ranged from 1.85 feet BTOC in GPT-03-27, adjacent to Canal No. 1, to 4.25 feet BTOC in GPT-03-18, located adjacent to North Pond. Groundwater elevations in deep wells ranged from 19.12 feet in GPT-03-27, located adjacent to Canal No. 1, to 19.30 feet in GPT-03-31, located adjacent to Golf Course Pond.

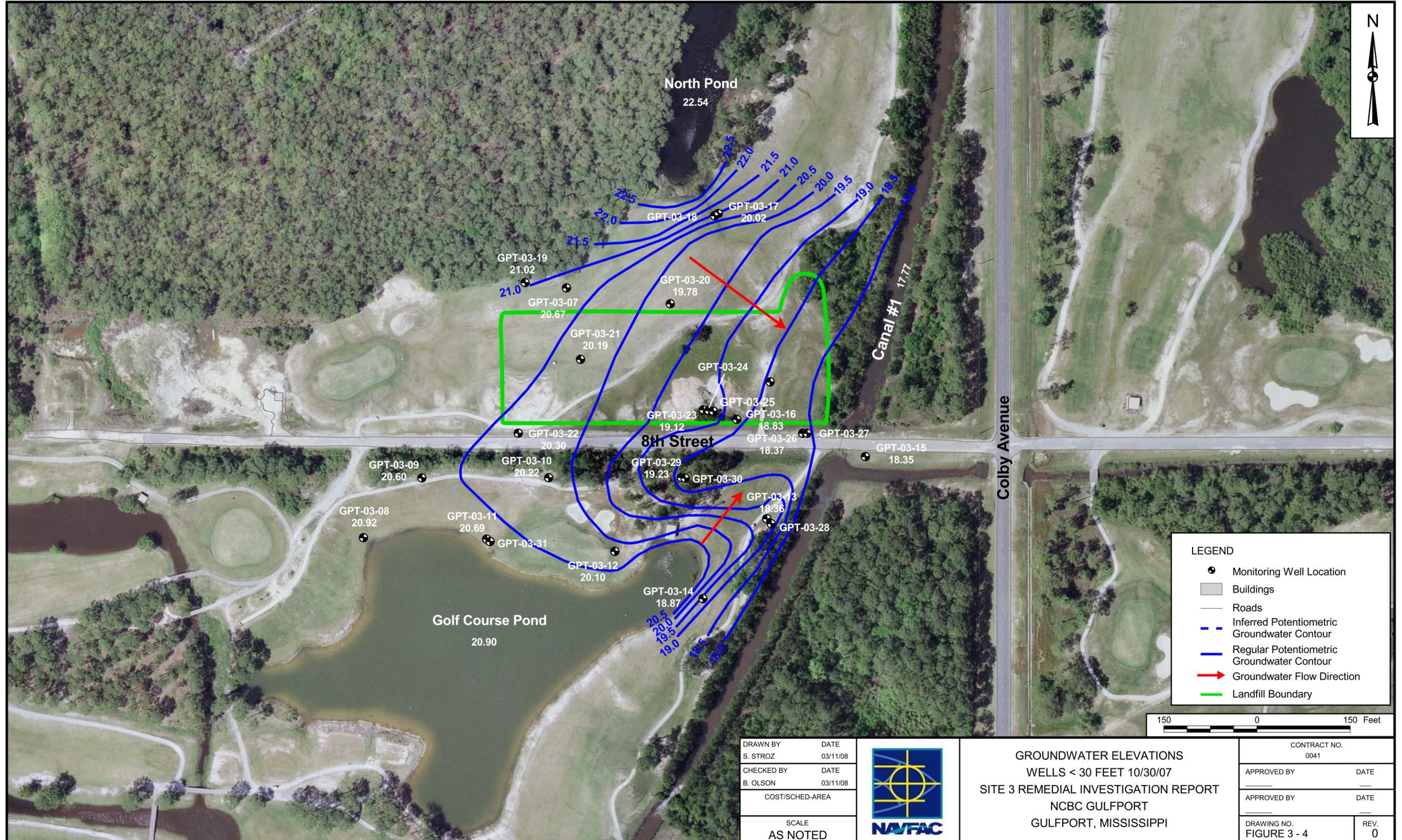
In October 2007, SWL measurements in deep wells ranged from 1.43 feet BTOC in GPT-03-27 to 3.76 feet BTOC in GPT-03-30, located south of 8th Street. Groundwater elevations in deep wells ranged from 19.56 feet in GPT-03-27, located adjacent to Canal No. 1, to 20.04 feet in GPT-03-18, located adjacent to North Pond.

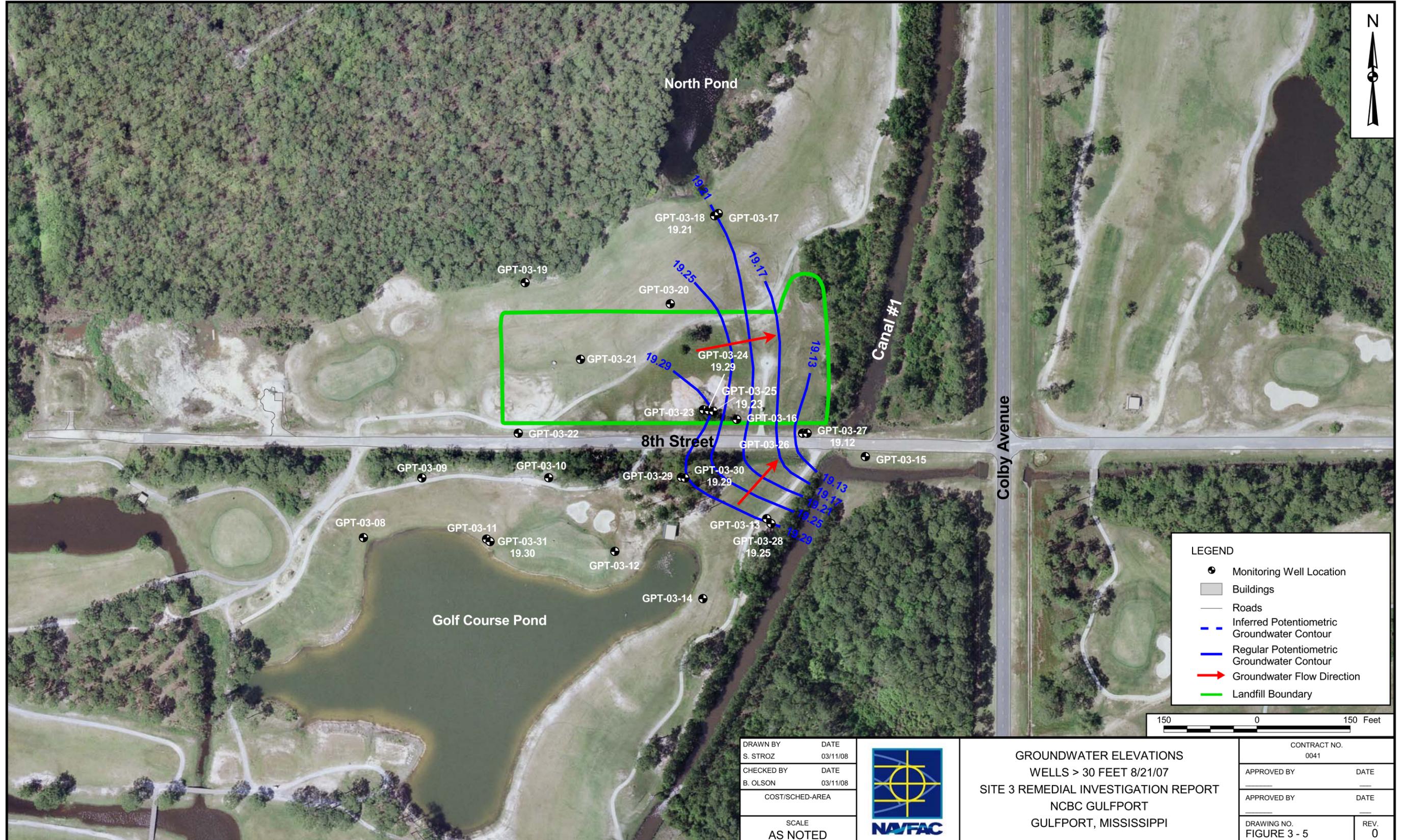
In October 2007, surface water elevations in North Pond and Golf Course Pond were higher than groundwater elevations in monitoring wells installed adjacent to the ponds. The surface water elevation in Canal No. 1 was lower than groundwater elevations in all site monitoring wells. These relationships between groundwater and surface water elevations indicate that the ponds near Site 3 can recharge the shallow surficial aquifer and that shallow groundwater can discharge to Canal No. 1.

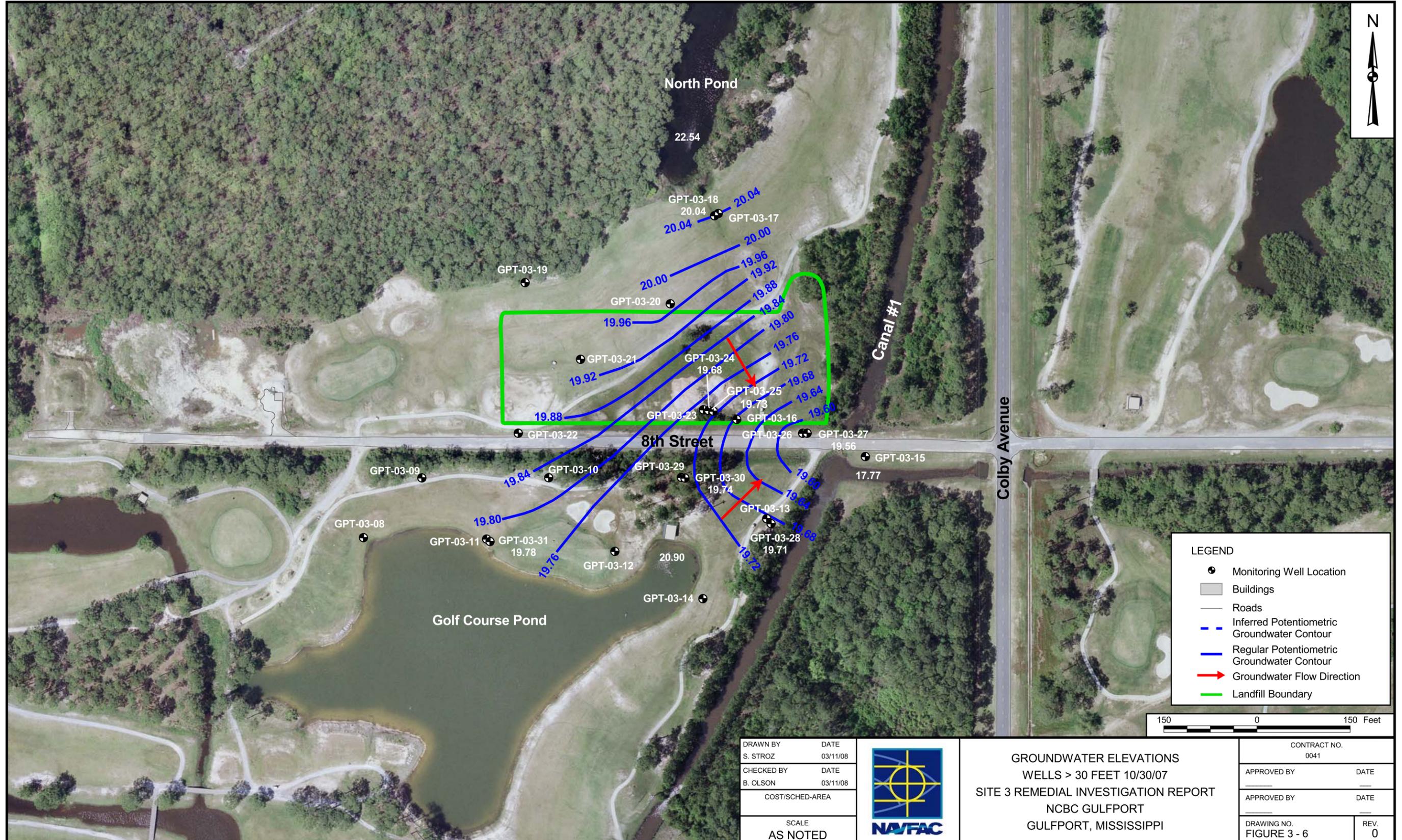
3.6.2 Groundwater Flow Direction

Groundwater elevations and associated contours are presented on Figures 3-5 and 3-6 for the shallow zone in August and October 2007, respectively, and on Figures 3-7 and 3-8 for the deep zone in August and October 2007, respectively. Based on these figures, groundwater flow in wells screened at less than 30 feet at Site 3 is generally east toward Canal No. 1 and away from North Pond and Golf Course Pond (Figures 3-5 and 3-6).









Groundwater flow direction in shallow wells for both events shows the influence of drainage ditches on both sides of 8th Street. Groundwater flow in wells screened at greater than 30 feet shows more variation. In August 2007, flow direction in deep wells was generally east toward Canal No. 1, similar to the shallow well groundwater flow direction (see Figure 3-7). In October 2007, flow direction in deep wells was more to the southeast on the northern side of 8th Street (see Figure 3-8).

3.6.3 Horizontal Hydraulic Gradient

The average horizontal groundwater gradient across the site was calculated using the following equation and groundwater elevations measured in site monitoring wells and the estimated groundwater flow direction:

$$I \equiv \frac{h_1 - h_2}{d}$$

where:

I = hydraulic gradient

h_1 = groundwater elevation at point 1, the highest value

h_2 = groundwater elevation at point 2, the lowest value

d = horizontal distance between points 1 and 2 parallel to direction of groundwater flow

The highest and lowest groundwater elevations measured in monitoring wells from each aquifer zone (shallow and deep) were used to determine the difference in groundwater elevation for that zone across the site. The horizontal distance between the high and low groundwater elevation points in each zone was measured parallel to the estimated groundwater flow direction. The horizontal groundwater gradients are summarized in Table 3-2.

In August 2007, the horizontal hydraulic gradient in the shallow wells at Site 3 was 0.003 foot per foot. In October 2007, the hydraulic gradient had increased to 0.005 foot per foot. This increase reflects the increased precipitation and recharge in the wetter part of the year. The mean of the shallow zone hydraulic gradient values is 0.004 foot per foot. The horizontal hydraulic gradient in deep wells at Site 3 was 0.001 foot per foot during both gauging events. The difference in gradient between the zones most likely represents the effects of surface water bodies at the site, which more strongly influence groundwater levels in shallower wells.

3.6.4 Vertical Hydraulic Gradient

The vertical groundwater gradient was estimated from groundwater elevations measured in shallow and deep monitoring well pairs installed at the site. The vertical gradient is determined from the difference in groundwater elevations in adjacent shallow and deep monitoring wells and the vertical separation of the

TABLE 3-2

HORIZONTAL HYDRAULIC GRADIENT
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

SHALLOW WELLS							
		WELL PAIRS	TOTAL DEPTH (fbls)	SCREENED INTERVAL (fbls)	TOP OF CASING ELEVATION (fams)	DEPTH TO WATER (fbtoc)	GROUNDWATER ELEVATION (fams)
8/21/2007	Highest	GPT-03-19	30	20-30	23.89	4.52	19.37
	Lowest	GPT-03-26	19	10-20	20.34	2.26	18.08
		HORIZONTAL DISTANCE (feet)		500	HORIZONTAL GRADIENT (feet/foot)		0.003
10/30/2007 (Southwest)	Highest	GPT-03-19	30	20-30	23.89	2.87	21.02
	Lowest	GPT-03-26	19	10-20	20.34	1.97	18.37
		HORIZONTAL DISTANCE (feet)		500	HORIZONTAL GRADIENT (feet/foot)		0.005
DEEP WELLS							
9/24/2004	Highest	GPT-03-31	50	40-50	22.34	3.04	19.30
	Lowest	GPT-03-27	35	25-35	20.99	1.87	19.12
		HORIZONTAL DISTANCE (feet)		525	HORIZONTAL GRADIENT (feet/foot)		0.000
9/27/2006	Highest	GPT-03-18	40	30-40	23.46	3.42	20.04
	Lowest	GPT-03-27	35	25-35	20.99	1.43	19.56
		HORIZONTAL DISTANCE (feet)		370	HORIZONTAL GRADIENT (feet/foot)		0.001

Notes:

fbls - feet below land surface

fams - feet above mean sea level

fbtoc - feet below top of casing

Horizontal distance measure parallel to direction of groundwater flow

screened intervals of the monitoring wells. The vertical separation of each well cluster is the difference in depth below grade of the middle of the shallow well screened interval and the middle of the deep well screened interval. If the groundwater elevation in the shallow well in a cluster is higher than the groundwater elevation in the deep well, the vertical gradient is negative or downward. If the groundwater elevation in the shallow well is lower than the groundwater elevation in the deep well, the vertical gradient is positive or upward. The vertical gradients are summarized in Table 3-3.

In general, vertical gradients were upward across the site, limiting the downward migration of contaminants in the shallow part of the aquifer and suggesting the potential for groundwater discharge to surface water bodies.

3.6.5 Hydraulic Conductivity

Hydraulic conductivity values for Site 3 were estimated using the data from slug tests conducted in selected monitoring wells. The slug test data and a summary of the results are included in Appendix B. The geometric mean of the hydraulic conductivity values reported for monitoring wells at Site 3 is approximately 18.2 feet per day. The slug test data indicate two orders of magnitude variation in hydraulic conductivity in the surficial aquifer.

3.6.6 Horizontal Groundwater Flow Velocity

Potential horizontal movement of groundwater at the site may be estimated in terms of transportation by natural flow in the saturated zone, assuming groundwater flow follows Darcy's Law. Darcy's Law is expressed as:

$$V \equiv \frac{(K * I)}{\eta}$$

where:

- V = average velocity
- K = hydraulic conductivity
- η = effective porosity
- I = average hydraulic gradient

Data from soil borings advanced during the DPT investigation indicate that fine-grained sand and silty or clayey sand are typical lithologies at the site. Review of standard literature suggests that a representative effective porosity for this lithology is approximately 30 percent (Heath, 1983).

**TABLE 3-3
VERTICAL HYDRAULIC GRADIENT
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

WELL PAIRS	TOTAL WELL DEPTH	SCREENED INTERVAL (fbls)	TOP OF CASING ELEVATION (fams)	8/21/2007		10/30/2007	
				DEPTH TO WATER (fbtoc)	GROUNDWATER ELEVATION (fams)	DEPTH TO WATER (fbtoc)	GROUNDWATER ELEVATION (fams)
GPT-03-11	25	15-25	22.68	3.63	19.05	1.99	20.69
GPT-03-31	50	40-50	22.34	3.04	19.30	2.56	19.78
SCREEN SEPARATION (feet)		15	VERTICAL GRADIENT		0.02		-0.06
GPT-03-13	30	20-30	23.08	4.97	18.11	4.72	18.36
GPT-03-28	40	35-40	23.14	3.89	19.25	3.43	19.71
SCREEN SEPARATION (feet)		12.5	VERTICAL GRADIENT		0.09		0.11
GPT-03-17	30	20-30	23.65	4.75	18.90	3.63	20.02
GPT-03-18	40	35-40	23.46	4.25	19.21	3.42	20.04
SCREEN SEPARATION (feet)		12.5	VERTICAL GRADIENT		0.02		0.002
GPT-03-23	24	14-24	21.49	3.13	18.36	2.37	19.12
GPT-03-25	41	31-41	21.25	2.02	19.23	1.52	19.73
SCREEN SEPARATION (feet)		17	VERTICAL GRADIENT		0.05		0.04
GPT-03-26	20	10-20	20.34	2.26	18.08	1.97	18.37
GPT-03-27	35	30-35	20.99	1.87	19.12	1.43	19.56
SCREEN SEPARATION (feet)		17.5	VERTICAL GRADIENT		0.06		0.07
GPT-03-29	30	20-30	23.46	5.09	18.37	4.23	19.23
GPT-03-30	40	35-40	23.50	4.21	19.29	3.76	19.74
SCREEN SEPARATION (feet)		12.5	VERTICAL GRADIENT		0.07		0.04

Notes:

fbls - feet below land surface

fams - feet above mean sea level

fbtoc - feet below top of casing

Negative gradients are downward, positive gradients are upward

Using an average hydraulic conductivity of 18.2 feet per day, an average hydraulic gradient of 0.004, and an effective porosity of 30 percent, the estimated average groundwater velocity in the shallow zone of the surficial aquifer at Site 3 is 0.24 foot per day. Using an average hydraulic conductivity of 18.2 feet per day, an average hydraulic gradient of 0.001 foot per foot, and an effective porosity of 30 percent, the estimated average groundwater velocity in the deep zone at Site 3 is 0.06 foot per day.

3.6.7 Regional Hydrogeology

In the Gulfport area, geologic units containing fresh water are of Miocene to Recent age. Aquifers are composed predominantly of sand beds that are irregular in thickness and horizontal extent. There are no thick, consistently traceable confining units between aquifers (Shows, 1970).

The uppermost aquifer is the surficial aquifer, which is composed of undifferentiated alluvium and Pamlico Sand terrace deposits (Recent to Pleistocene in age). The Pamlico Sand formation is approximately 60 to 70 feet thick and is composed of fine sands and shale or clay. Depth to groundwater in the surficial aquifer is variable depending on local topography and precipitation, but generally ranges from 4 to 7 feet. In the northern portion of the Base, shallow groundwater flow in the surficial aquifer is northwest toward Turkey Creek, which empties into Bernard Bayou and eventually into the Gulf of Mexico via the Mississippi Sound. Generally, this aquifer is not used for potable water supply.

Beneath the surficial aquifer are hydrogeologic units referred to collectively as the Miocene aquifers, which include the Citronelle Formation and Graham Ferry Formation (Pliocene) and Pascagoula, Hattiesburg, and Catahoula Formations (Miocene). Boundaries between the aquifers are vaguely defined, if at all. These aquifers are composed of sands and discontinuous clays. The Miocene aquifers are a major source of potable water in the Gulfport area.

Wells in the Citronelle Formation are used in Harrison County for both domestic and industrial water supply. Supply wells in the Upper and Lower Pascagoula Formations provide the majority of fresh water used in the Coastal Plain. The Hattiesburg Formation becomes increasingly brackish with depth, and salt water is encountered near the base of this unit (approximately 2,000 feet below sea level).

3.7 DEMOGRAPHY AND LAND USE

NCBC Gulfport is located in the western part of the City of Gulfport, Mississippi, in southeastern Harrison County. Biloxi, the largest city in Harrison County, is located 7 miles east of Gulfport, and Pass Christian is located 7 miles to the west.

NCBC Gulfport is an active military facility with a primary mission of supporting battalions of the Naval Construction Force (NCF) and the storage and maintenance of pre-positioned War Reserve Material Stock. NCF support consists of both homeport services and deployed support. Additional missions include tenant support and services to other activities in the region.

Land uses on base include training activities, equipment and materials storage, maintenance areas, recreational facilities, and residential housing for military personnel. Land use in off-base areas adjacent to NCBC Gulfport is primarily residential.

Site 3 is located on part of the base golf course; therefore, recreational users and trespassers, as well as site and maintenance workers, are expected to use the site.

3.8 ECOLOGY

Site 3 is located in the northwestern corner of the base. Areas to the east of the site are developed and used as training facilities. The area to the northwest of the Pine Bayou Golf Course is currently undeveloped.

3.8.1 Aquatic Habitats

Canal No. 1 at Site 3 is part of the network of interconnected ditches and canals that convey storm water on the base. The on-base ditches at NCBC Gulfport are generally straight and uniform in width, lacking the morphological properties of natural streams. Aquatic plants may grow in stable sand and gravel banks near and below water levels. Wading birds, fish, and benthic organisms have been observed in the ditches and canals on the base.

The two ponds adjacent to Site 3, Golf Course Pond and North Pond, are excavated features. There is limited natural vegetation on the perimeter of Golf Course Pond. Forested wetlands are located west and north of North Pond, and a less densely wooded area is located east of the pond.

3.8.2 Terrestrial Habitats

Site 3 is located on the 16th fairway of the Pine Bayou Golf Course. Ground cover at the site is predominantly maintained grass, with a small area of trees to the east and a large forested wetland to the northwest. Large trees are present on the western side of Canal No. 1. On-site wildlife may forage at Site 3 but, due to lack of suitable cover on the golf course, wildlife use is assumed temporary. Snakes, turtles, frogs, nutria, and Canadian geese have been observed at the site.

3.8.3 Species of Concern

A request for a listing of species of concern was sent to the Heritage Program of the Mississippi Museum of Natural Science. The response from the Heritage Program, dated February 24, 2003, cited no occurrences of state or federal listed or proposed endangered or threatened plants or animals on NCBC Gulfport.

4.0 NATURE AND EXTENT OF CONTAMINATION

As stated in Section 1.0, the data collected for the RI was to provide the information necessary to (1) adequately characterize the site, (2) define site dynamics, and (3) define risks. Section 4.0 presents the characterization of the site by the following:

- Identifying the types of materials disposed of during landfill operations.
- Evaluating the extent of potential sources of contaminants that could impact receptors outside the boundary of the containment area (cap).
- Identifying contaminants based on screening against state and federal criteria for exposure to human receptors, ecological receptors, and potential receiving media.

The screening criteria used to evaluate the nature and extent of contamination in environmental media at Site 3 included the following:

- MDEQ Tier 1 Target Remedial Goals (TRGs)
- USEPA Region 9 Preliminary Remediation Goals (PRGs)
- USEPA Soil Screening Levels (SSLs) for migration to air and groundwater
- USEPA Groundwater Volatilization Criteria (GVC)
- USEPA Region 4 Ecological Screening Values (ESVs)

The screening criteria used to evaluate environmental media sampled at Site 3 are summarized in Table 4-1.

The Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills (USEPA, 1996c) identifies the waste characteristics of military landfills that allow the application of the presumptive remedy guidance. The guidance states that appropriate characteristics include the following:

- Risks are low-level except for “hot spots”.
- Treatment of wastes is usually impractical due to the volume and heterogeneity of the waste.
- Waste types include household, commercial, non-hazardous sludge, and industrial waste solids.
- Lesser quantities of hazardous wastes are present compared to municipal wastes.
- Land application units, surface impoundments, injection wells, and waste piles are **not** included.

TABLE 4-1
SCREENING CRITERIA
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Media	Direct Exposure Receptors					Migration Pathways			Ecological Receptors
	Soil and Sediment		Surface Water and Groundwater			Soil	Groundwater	Various Media	
	MDEQ Tier 1 TRG	USEPA Region IX PRG	MDEQ Tier 1 TRG	USEPA Region IX PRG	USEPA Tap Water MCL	USEPA SSL Soil to Air	USEPA SSL Soil to Groundwater	USEPA GVC (Volatiles Only)	USEPA Region IV ESV
Soil Gas									
Surface Soil	X	X				X	X		X
Subsurface Soil	X	X				X	X		
Groundwater			X	X	X			X	
Surface Water			X	X					X
Sediment	X	X							X

Notes:

MDEQ Mississippi Department of Environmental Quality
 TRG Target Remediation Goal
 USEPA United States Environmental Protection Agency
 PRG Preliminary Remediation Goal
 MCL Maximum Contaminant Level
 SSL Soil Screening Level
 GVC Groundwater Volatilization Criteria
 ESV Ecological Screening Value

The guidance further states that it is anticipated that military landfills will have industrial solid waste, paints (and paint thinners), pesticides, transformer oils, and other solvents in relatively low proportion to the volume of municipal wastes – including construction debris, commercial/household type garbage, and yard wastes. The types of waste that would exclude a military site from presumptive remedy consideration include chemical warfare agents, munitions, and other explosives. Based on the site history, operational history of the base, and results from previous investigations, Site 3 qualifies for presumptive remedy consideration.

To examine the specific contaminant sources at Site 3 and to begin the definition of site dynamics, the following sections describe the types, distribution, and trends of contaminants present in the various media.

4.1 WASTE DISPOSAL BOUNDARY AND CONTAMINANT SOURCES

The first requirements of the presumptive remedy RI for landfills were to characterize adequately the extent of the disposal area and to determine if the types of wastes at the site are appropriate for a presumptive remedy.

4.1.1 Waste Disposal Boundary

At Site 3, the waste disposal boundary was established by evaluating the results of the magnetometer (shown on Figure 2-1) and EM-61 (shown on Figure 2-2) surveys. Both the EM-61 and magnetometer results indicate a roughly rectangular landfill approximately 125 feet (north to south) by 500 feet (west to east). The landfill area as defined by the geophysical survey is approximately 1.5 acres. The southern edge of the disposal area is approximately 50 feet north of 8th Street. The eastern edge of the disposal area is 50 to 100 feet west of Canal No. 1.

The higher-level responses on the EM-61 in several areas were influenced by the steel rebar in the golf cart paths. Examples are on the southwestern edge of the survey area, as indicated by the linear east to west trending anomaly.

Visual observations of soil samples at DPT sampling locations and monitoring well locations further aided in delineation of the waste disposal area. Some of the material and soil matrix showed indications of burning. In addition, these observations confirmed that the geophysical survey was effective in accurately determining the waste disposal boundaries of the landfill.

4.1.2 Contaminant Sources

A review of disposal practices and interviews with site workers during the IAS (Envirodyne Engineering, 1985) determined that approximately 30,000 tons of solid wastes were disposed at the site between 1948 and the mid-1960s. The solid waste, generated by base activities, was placed in trenches and burned on a daily basis prior to backfilling. Flammable liquid wastes generated by the base were often used as accelerants. These liquid wastes included fuels, oils, and solvents.

A fire-fighting training pit was also located at the site west of the landfill and was used frequently from the mid-1950s to 1966. Waste fuel, oil, solvents, paint, and paint thinners from throughout the installation were transported to the burning pit, and during practice burns, waste liquids were drained into the unlined pit and ignited. An estimated 130,000 gallons of waste fuels, oils, solvents, paints, and paint thinners were burned at the fire-fighting training pit.

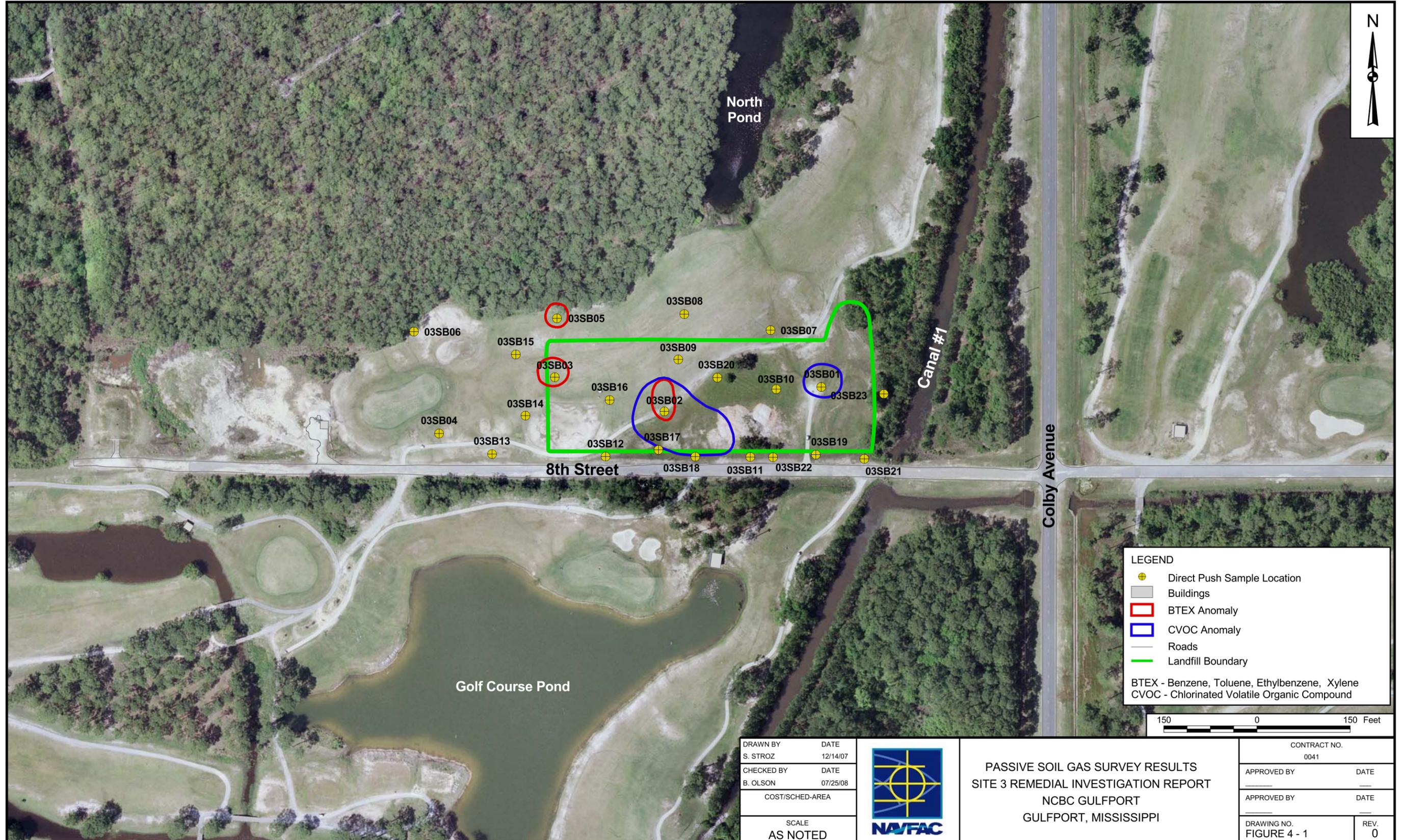
4.2 SOILS AND VADOSE ZONE

4.2.1 Passive Soil-Gas Survey

The passive soil-gas survey was conducted to provide a qualitative evaluation of the presence or absence of volatile contaminants in soil and shallow groundwater. The passive soil-gas methodology does not distinguish between contaminants present in soil, groundwater, or both media. The concentrations of contaminants reported by this method do not directly correlate to quantified concentrations in soil or groundwater samples used for risk-based screening.

CVOC anomalies were detected at two areas: one in the western half of the disposal area and one near the eastern end of the disposal area (see Figure 4-1). The western hot spot was larger in area (150 by 75 feet), and DCE and TCE were detected in soil-gas samples from this hot spot. The eastern hot spot covered a smaller area (approximately 40 feet in diameter), but tetrachloroethene (PCE) was also detected along with DCE and TCE.

BTEX anomalies were detected at two areas, one in the western half of the disposal area (corresponding with the CVOC hot spot) and one near the northwestern corner of the disposal area, possibly associated with the fire-fighting training pit (see Figure 4-1). The detected BTEX responses were two orders of magnitude less than the responses at the CVOC hot spots, suggesting that the BTEX concentrations in soil and groundwater are also less than the CVOC concentrations in these media.



The results of the soil-gas survey were used to determine the locations of soil and groundwater samples for quantitative analysis.

4.2.2 Surface Soil

The current surface soil cover at Site 3 was brought in as fill during golf course construction. The source of the fill material is unknown. Surface soil samples were collected from a depth of 0 to 1 foot bls at 10 locations in the waste disposal area at Site 3 and were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, Appendix IX chlorinated herbicides, and TAL inorganics. Analytes detected in the surface soil samples are summarized in Table 4-2, and results exceeding screening criteria are presented in Figure 4-2.

4.2.2.1 Volatile Organics

Chloroform was detected in the surface soil sample collected at 03SS08 and was the only VOC detected in a surface soil sample. The reported concentration of chloroform in this sample was less than the screening criteria.

4.2.2.2 Semivolatile Organics

Bis(2-ethylhexyl) phthalate, caprolactam, and several polynuclear aromatic hydrocarbons (PAHs) were detected in surface soil samples collected at Site 3. The concentrations of the non-PAH SVOCs, bis(2-ethylhexyl) phthalate, and caprolactam were less than screening criteria.

PAHs were detected at three surface soil sample locations, 03SS01, 03SS07, and 03SS09. Sample 03SS0101 was collected at the northwestern corner of the landfill area and may be in proximity to the former burn pit. Samples 03SS0701 and 03SS0901 were located near the eastern end of the landfill and may be in an area that received less fill during golf course construction.

Benzo(a)pyrene was detected at estimated concentrations ranging from 170 to 210 micrograms per kilogram ($\mu\text{g}/\text{kg}$), greater than the unrestricted TRG ($87.5 \mu\text{g}/\text{kg}$) and PRG ($15 \mu\text{g}/\text{kg}$). Benzo(a)anthracene was detected in samples 03SS0101 at estimated concentrations of 160 and $170 \mu\text{g}/\text{kg}$, respectively, greater than the SSL for soil to groundwater ($160 \mu\text{g}/\text{kg}$) and the PRG ($150 \mu\text{g}/\text{kg}$). Benzo(b)fluoranthene was detected at estimated concentrations ranging from 270 to $360 \mu\text{g}/\text{kg}$, greater than the PRG ($150 \mu\text{g}/\text{kg}$). Chrysene was detected in samples 03SS0101 and 03SS0901 at estimated concentrations of 220 and $230 \mu\text{g}/\text{kg}$, respectively, greater than the SSL for soil to groundwater ($160 \mu\text{g}/\text{kg}$).

TABLE 4-2
SURFACE SOIL- SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
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Sample Location Sample ID Sample Depth (feet) Sample Date	MDEQ Tier 1 TRG Restricted	MDEQ Tier 1 TRG Unrestricted	USEPA Region IX PRG	USEPA SSL Soil to Air	USEPA SSL Soil to Groundwater	USEPA Region IV ESV	03SS01 03SS0101 0 - 1 08/28/07	03SS02 03SS0201 0 - 1 08/28/07	03SS03 03SS0301 0 - 1 08/28/07	03SS04 03SS0401 0 - 1 08/28/07	03SS05 03SS0501 0 - 1 08/28/07	03SS06 03SS0601 0 - 1 08/28/07
Volatile Organics (µg/kg)												
CHLOROFORM	478	312	220	280	29	1	6.7 U	5.8 U	7.5 U	5.4 U	6.2 U	5.4 U
Semivolatile Organics (µg/kg)												
BENZO(A)ANTHRACENE	7840	875	150	NA	160	1100	160 J	370 U	450 U	360 U	420 U	370 U
BENZO(A)PYRENE	784	87.5	15	NA	410	1100	210 J	370 U	450 U	360 U	420 U	370 U
BENZO(B)FLUORANTHENE	7840	875	150	NA	490	1100	360 J	370 U	450 U	360 U	420 U	370 U
BENZO(G,H,I)PERYLENE	61300000	2350000	230000	NA		1100	430 UJ	370 U	450 U	360 U	420 U	370 U
BENZO(K)FLUORANTHENE	78400	8750	1500	NA	490	1100	240 J	370 U	450 U	360 U	420 U	370 U
BIS(2-ETHYLHEXYL)PHTHALATE	409000	45600	35000	NA	180000	NA	430 U	53 J	450 U	66 J	86 J	370 U
CAPROLACTAM	102000000	39100000	3100000	NA	3900	NA	430 U	370 U	260 J	360 U	170 J	370 U
CHRYSENE	784000	87500	15000	NA	160	1100	220 J	370 U	450 U	360 U	420 U	370 U
FLUORANTHENE	81700000	3130000	230000	NA	310000	29000	160 J	370 U	450 U	360 U	420 U	370 U
PYRENE	61300000	2350000	230000	NA	230000	1100	370 J	370 U	450 U	360 U	420 U	370 U
LOW MOLECULAR WEIGHT PAH	NA	NA				29000	160	370 U	450 U	360 U	420 U	370 U
HIGH MOLECULAR WEIGHT PAH	NA	NA				1100	1560	370 U	450 U	360 U	420 U	370 U
TOTAL PAH	NA	NA				1000	1720	370 U	450 U	360 U	420 U	370 U
Pesticides/PCBs (µg/kg)												
4,4'-DDD	23800	2660	2400	NA	710	NA	2.4	0.58 U	0.72 U	0.56 U	0.65 U	0.58 U
4,4'-DDE	16800	1880	1700	NA	2200	NA	4.9	0.58 U	0.72 U	0.56 U	0.65 U	0.58 U
4,4'-DDT	16800	1880	1700	750000	1300	NA	1.7 J	0.58 UJ	0.72 UJ	0.29 J	0.65 UJ	0.58 UJ
TOTAL DDD/DDE/DDT	NA	NA				21	9	0.58 U	0.72 U	0.29	0.65 U	0.58 U
ALDRIN	337	37.6	29	3400	25	2.5	0.33 U	0.29 U	0.36 U	0.28 U	0.32 U	0.29 U
ALPHA-BHC	908	101	90	750	0.036	2.5	0.33 U	0.64 J	0.36 UJ	0.28 UJ	0.32 UJ	0.29 UJ
BETA-BHC	3180	355	320	6000	0.13	1	0.33 U	0.19 J	0.36 U	0.13 J	0.32 U	0.29 U
GAMMA-BHC (LINDANE)	4400	491	440	NA	0.47	0.05	0.71 J	0.29 U	1.2 J	0.45 J	0.32 U	0.29 U
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	9.7 J	0.29 U	0.36 U	0.14 J	0.44	0.29 U
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	5.6 J	0.098 J	0.36 U	0.28 U	0.33 J	0.29 U
TOTAL CHLORDANE	1820	12300	1600	72000	480	NA	15.3 J	0.098 J	0.36 U	0.14 J	0.77 J	0.29 U
DIELDRIN	358	39.9	30	1100	0.23	4.9	1.9 J	0.58 U	0.72 U	0.5 J	0.17 J	0.58 U
ENDOSULFAN II	NA	NA	37000	NA	980	NA	0.67 U	0.28 J	0.72 U	0.56 U	0.65 U	0.58 U
ENDOSULFAN SULFATE	NA	NA	37000	NA	980	NA	0.67 U	0.58 U	0.72 U	0.56 U	0.65 U	0.58 U
ENDRIN	61300	23500	1800	NA	50	1	0.67 U	0.58 UJ	0.72 UJ	0.56 UJ	0.65 UJ	0.58 UJ
ENDRIN ALDEHYDE	NA	NA	1800	NA	50	NA	0.45 J	0.58 U	0.72 U	0.56 U	0.65 U	0.58 U
HEPTACHLOR EPOXIDE	629	70.2	53	4700	33	NA	0.47 J	0.29 U	0.36 U	0.28 U	0.32 U	0.29 U
Herbicides (µg/kg)												
DINOSEB	204000	78200	6100	NA	19	NA	16 U	14 U	17 U	13 U	16 U	14 U

**TABLE 4-2
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SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
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Sample Location Sample ID Sample Depth (feet) Sample Date	MDEQ Tier 1 TRG Restricted	MDEQ Tier 1 TRG Unrestricted	USEPA Region IX PRG	USEPA SSL Soil to Air	USEPA SSL Soil to Groundwater	USEPA Region IV ESV	03SS01 03SS0101 0 - 1 08/28/07	03SS02 03SS0201 0 - 1 08/28/07	03SS03 03SS0301 0 - 1 08/28/07	03SS04 03SS0401 0 - 1 08/28/07	03SS05 03SS0501 0 - 1 08/28/07	03SS06 03SS0601 0 - 1 08/28/07
Inorganics (mg/kg)												
ALUMINUM	2040000	78200	75000	709000	8.3	50	5820	2670	3480	6570	3860	6180
ANTIMONY	81.7	31.3	31	NA	0.27	0.27	1.2 UJ	1.0 UJ	1.2 UJ	0.99 UJ	1.2 UJ	1.1 UJ
ARSENIC	3.82	0.426	0.39	769	0.29	18	1.8	1.2	1.2	2.7	1.9	1.3
BARIUM	14300	5480	15000	70900	82	330	14	6.7	7.2	9.4	9	11.7
CADMIUM	1020	39.1	37	1840	0.38	0.36	0.24 U	0.2 U	0.25 U	0.2 U	0.24 U	0.21 U
CALCIUM	NA	NA	NA	NA		NA	2490 J	204 U	246 U	497 J	4560 J	211 U
CHROMIUM	381	227	30	276	2.1	26	7.2 J	2.8 J	3.5 J	7.0 J	4.3 J	5.3 J
COBALT	12300	4690	1400	1180	0.17	13	1.2 U	1.0 U	1.2 U	0.99 U	1.5	1.1 U
COPPER	8170	3130	3100		560	28	8.7	1.0 U	1.2 U	0.99 U	2.1	1.1 U
IRON	613000	23500	55000			200	4760 J	2560 J	3470 J	12900 J	3690 J	7370 J
LEAD	1700	400	400			11	22.6 J	2.6 J	3.0 J	5.4 J	10.7 J	3.8 J
MAGNESIUM	NA	NA				NA	240 U	204 U	246 U	197 U	277 J	211 U
MANGANESE	4080	1560	1800	7090	110	220	25.8 J	1.9 J	2.8 J	4.6 J	6.7 J	3.4 J
MERCURY	61.3	10	23		0.1	0.1	0.029	0.015 U	0.015 U	0.013 U	0.027	0.013 U
NICKEL	4080	1560	1600		14	38	2.4	1.0 U	1.2 U	1.5	2.3	1.4
SELENIUM	1020	391	390		0.26	0.52	0.72 U	0.61 U	0.74 U	0.68	0.72 U	0.63 U
VANADIUM	1430	548	78		260	7.8	10.2	5.1	6.3	18.8	7.2	12.8
ZINC	61300	23500	23000		680	46	35.0 J	1.7 J	1.9 J	11.1 J	17.6 J	2.9 J
CYANIDE	4080	1560	120		2	0.9	0.16 U	0.14 U	0.17 U	0.13 U	0.16 U	0.14

TABLE 4-2
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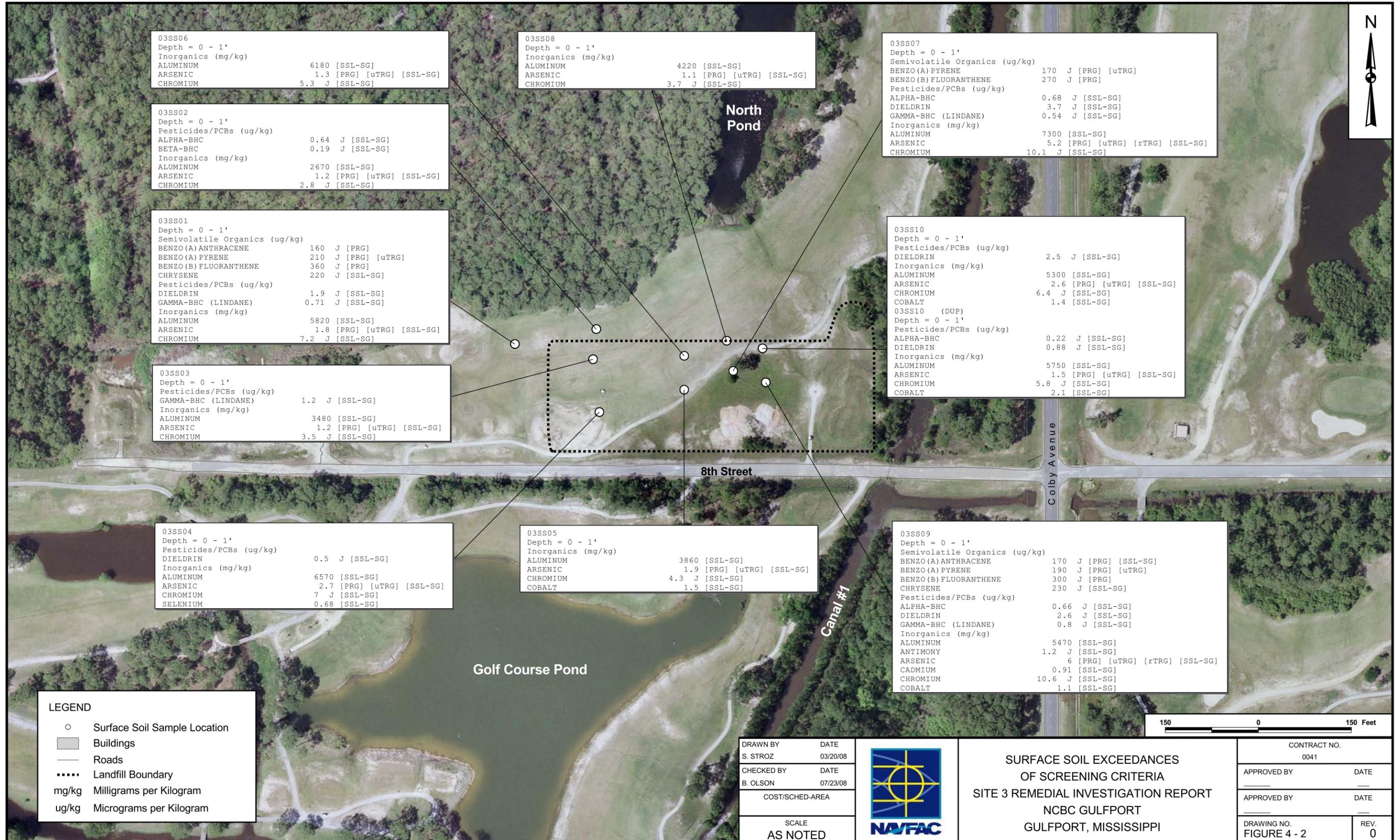
Sample Location Sample ID Sample Depth (feet) Sample Date	MDEQ Tier 1 TRG Restricted	MDEQ Tier 1 TRG Unrestricted	USEPA Region IX PRG	USEPA SSL Soil to Air	USEPA SSL Soil to Groundwater	USEPA Region IV ESV	03SS07 03SS0701 0 - 1 08/28/07	03SS08 03SS0801 0 - 1 08/28/07	03SS09 03SS0901 0 - 1 08/28/07	03SS10	
										03SS1001 0 - 1 08/28/07	03SS1001D 0 - 1 08/28/07
Volatile Organics (µg/kg)											
CHLOROFORM	478	312	220	280	29	1	5.5 U	0.61 J	5.4 U	5.1 U	5 U
Semivolatile Organics (µg/kg)											
BENZO(A)ANTHRACENE	7840	875	150	NA	160	1100	84 J	380 U	170 J	390 U	390 U
BENZO(A)PYRENE	784	87.5	15	NA	410	1100	170 J	380 U	190 J	390 U	390 U
BENZO(B)FLUORANTHENE	7840	875	150	NA	490	1100	270 J	380 U	300 J	390 U	390 U
BENZO(G,H,I)PERYLENE	61300000	2350000	230000	NA		1100	400 U	380 U	100 J	390 U	390 U
BENZO(K)FLUORANTHENE	78400	8750	1500	NA	490	1100	200 J	380 U	240 J	390 U	390 U
BIS(2-ETHYLHEXYL)PHTHALATE	409000	45600	35000	NA	180000	NA	84 J	380 U	280 J	63 J	52 J
CAPROLACTAM	102000000	39100000	3100000	NA	3900	NA	400 U	380 U	380 U	390 U	390 U
CHRYSENE	784000	87500	15000	NA	160	1100	150 J	380 U	230 J	390 U	390 U
FLUORANTHENE	81700000	3130000	230000	NA	310000	29000	74 J	380 U	73 J	390 U	390 U
PYRENE	61300000	2350000	230000	NA	230000	1100	140 J	380 U	150 J	390 U	390 U
LOW MOLECULAR WEIGHT PAH	NA	NA				29000	74	380 U	73	390 U	390 U
HIGH MOLECULAR WEIGHT PAH	NA	NA				1100	1014	380 U	1380	390 U	390 U
TOTAL PAH	NA	NA				1000	1088	380 U	1453	390 U	390 U
Pesticides/PCBs (µg/kg)											
4,4'-DDD	23800	2660	2400	NA	710	NA	2	0.58 U	2.4 J	3.3 J	0.73 J
4,4'-DDE	16800	1880	1700	NA	2200	NA	3.8	0.58 U	3.9	1.3 J	0.73 J
4,4'-DDT	16800	1880	1700	750000	1300	NA	4.6	0.58 UJ	3 J	17 J	2.4 J
TOTAL DDD/DDE/DDT	NA	NA				21	10.4	0.58 U	9.3	21.6	3.86
ALDRIN	337	37.6	29	3400	25	2.5	0.32 U	0.29 U	0.31 J	0.66 J	0.3 U
ALPHA-BHC	908	101	90	750	0.036	2.5	0.68 J	0.29 UJ	0.66 J	0.3 U	0.22 J
BETA-BHC	3180	355	320	6000	0.13	1	0.32 U	0.11 J	0.3 U	0.3 U	0.3 U
GAMMA-BHC (LINDANE)	4400	491	440	NA	0.47	0.05	0.54 J	0.29 U	0.8 J	0.3 U	0.3 U
ALPHA-CHLORDANE	NA	NA	NA	NA	NA	NA	11 J	0.15 J	26 J	7.3 J	0.79 J
GAMMA-CHLORDANE	NA	NA	NA	NA	NA	NA	12 J	0.29 U	14 J	5.5 J	0.41 J
TOTAL CHLORDANE	1820	12300	1600	72000	480	NA	33 J	0.15 J	40 J	12.8 J	1.2 J
DIELDRIN	358	39.9	30	1100	0.23	4.9	3.7 J	0.58 U	2.6 J	2.5 J	0.88 J
ENDOSULFAN II	NA	NA	37000	NA	980	NA	0.63 U	0.32 J	1.5 J	0.61 U	0.61 U
ENDOSULFAN SULFATE	NA	NA	37000	NA	980	NA	0.63 U	0.58 U	2.1 J	0.61 U	0.61 U
ENDRIN	61300	23500	1800	NA	50	1	0.63 U	0.58 U	0.6 U	0.62 J	0.61 U
ENDRIN ALDEHYDE	NA	NA	1800	NA	50	NA	0.18 J	0.58 U	0.6 U	0.61 U	0.61 U
HEPTACHLOR EPOXIDE	629	70.2	53	4700	33	NA	0.25 J	0.29 U	0.23 J	0.3 U	0.3 U
Herbicides (µg/kg)											
DINOSEB	204000	78200	6100	NA	19	NA	15 U	14 U	14 U	14 J	15 U

TABLE 4-2
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SITE 3 REMEDIAL INVESTIGATION REPORT
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Sample Location Sample ID Sample Depth (feet) Sample Date	MDEQ	MDEQ	USEPA	USEPA	USEPA	USEPA	03SS07	03SS08	03SS09	03SS10	
	Tier 1 TRG Restricted	Tier 1 TRG Unrestricted	Region IX PRG	SSL Soil to Air	SSL Soil to Groundwater	Region IV ESV	03SS0701 0 - 1 08/28/07	03SS0801 0 - 1 08/28/07	03SS0901 0 - 1 08/28/07	03SS1001 0 - 1 08/28/07	03SS1001D 0 - 1 08/28/07
Inorganics (mg/kg)											
ALUMINUM	2040000	78200	75000	709000	8.3	50	7300	4220	5470 [S]	5300	5750
ANTIMONY	81.7	31.3	31	NA	0.27	0.27	1.1 UJ	1.1 UJ	1.2 J	1.1 UJ	1.2 UJ
ARSENIC	3.82	0.426	0.39	769	0.29	18	5.2	1.1	6.0	2.6	1.5
BARIUM	14300	5480	15000	70900	82	330	19.8	8.3	23.2	12.4	12.4
CADMIUM	1020	39.1	37	1840	0.38	0.36	0.23 U	0.23 U	0.91	0.23 U	0.24 U
CALCIUM	NA	NA	NA	NA		NA	1240 J	230 U	1440 J	2780 J	1510 J
CHROMIUM	381	227	30	276	2.1	26	10.1 J	3.7 J	10.6 J	6.4 J	5.8 J
COBALT	12300	4690	1400	1180	0.17	13	1.1 U	1.1 U	1.1	1.4	2.1
COPPER	8170	3130	3100		560	28	8.7	1.1 U	15.2	1.3	1.6
IRON	613000	23500	55000			200	6040 J	2950 J	5710 J	7500 J	5160 J
LEAD	1700	400	400			11	39.8 J	2.7 J	59.3 J	41.4 J	26.3 J
MAGNESIUM	NA	NA				NA	227 U	230 U	1080 J	228 U	245 U
MANGANESE	4080	1560	1800	7090	110	220	25.2 J	2.4 J	44.2 J	18.3 J	12.6 J
MERCURY	61.3	10	23		0.1	0.1	0.08	0.013 U	0.06	0.014	0.019
NICKEL	4080	1560	1600		14	38	3.7	1.1 U	8	2	3
SELENIUM	1020	391	390		0.26	0.52	0.68 U	0.69 U	0.63 U	0.68 U	0.73 U
VANADIUM	1430	548	78		260	7.8	11.2	6.4	8.7	11.1	8.8
ZINC	61300	23500	23000		680	46	94.8 J	2.1 J	255 J	30.4 J	26.5 J
CYANIDE	4080	1560	120		2	0.9	0.15 U	0.14 U	0.14 U	0.15 U	0.15 U

Notes:

MDEQ = Mississippi Department of Environmental Quality
 TRG = Target Remediation Goal
 USEPA = United States Environmental Protection Agency
 PRG = Preliminary Remediation Goal
 SSL = Soil Screening Level
 ESV = Ecological Screening Value
 µg/kg = micrograms per kilogram
 mg/kg = milligrams per kilogram
 U = Concentration less than value shown
 J = Estimated concentration
 Values in bold are positive detections
 Bold and shaded values exceed one or more screening criteria
 NA = No criteria available



Total PAHs, total low molecular weight (MW) and high MW PAHs were summed and compared to ESVs. Total PAH and high MW PAH concentrations exceeded ESVs at 03SS0101 and 03SS0901. Only the total PAH concentration exceeded the ESV at 03SS0701. Fluoranthene was the only low MW PAH detected in surface soil samples, and the concentrations were less than the ESV. The following summarizes the nature and extent of PAH detections:

- The detected PAHs are consistent with burning of waste during landfill operation.
- PAH concentrations exceeding screening criteria were limited to three surface soil sample locations.

4.2.2.3 Pesticides/PCBs

Pesticides were detected at low levels in each of the surface soil samples collected at Site 3, less than direct exposure human health criteria (TRGs and PRGs) and SSLs for the soil-to-air migration pathway. Concentrations of several pesticides exceeded SSLs for the soil-to-groundwater migration pathway and/or ESVs for ecological receptors.

Dichlorodiphenyldichloroethane (DDD), dichlorodiphenyldichloroethylene (DDE), and dichlorodiphenyltrichloroethane (DDT) were detected in 4 of 10 surface soil samples, 03SS0101, 03SS0701, 03SS0901, and 03SS1001. Only DDT was detected in 03SS0401. Individually, DDD, DDE, and DDT concentrations in these samples were less than screening criteria. The total DDD/DDE/DDT for one sample, 03SS1001, was 21.6 µg/kg, which exceeded the ESV of 21 µg/kg. The concentration in the field duplicate of this sample was 3.86 µg/kg.

One or more of the isomers of benzene hexachloride (BHC), alpha, beta, and gamma (Lindane), were detected in 8 of 10 surface soil samples. Gamma-BHC (Lindane) concentrations in four samples (03SS01) were greater than the SSL for soil to groundwater (0.47 µg/kg) and the ESV (0.05 µg/kg). The gamma-BHC concentration in 03SS0401 was 0.45 µg/kg, which is less than the SSL and greater than the ESV. Gamma-BHC concentrations in the other surface soil samples were less than standard laboratory detection limits.

Alpha-BHC was detected four surface soil samples (03SS0201, 03SS0701, 03SS0901, and the duplicate of 03SS1001) at concentrations greater than the SSL for soil to groundwater (0.036 µg/kg). The alpha-BHC concentration in the original sample at location 03SS10 and alpha-BHC concentrations in the other surface soil samples were less than standard laboratory detection limits.

Beta-BHC was reported in 03SS0302 at an estimated concentration of 0.19 µg/kg, which is greater than the SSL for soil to groundwater (0.13 µg/kg). The other detected concentrations of beta-BHC, 0.13 µg/kg at 03SS0401 and 0.11 µg/kg at 03SS0801, were less than screening criteria.

Dieldrin was detected at five surface soil sample locations at concentrations ranging from 0.5 to 3.7 µg/kg, greater than the SSL for soil to groundwater (0.23 µg/kg). The dieldrin concentration reported for 03SS0501 was 0.17 µg/kg, which was less than the screening criteria. Dieldrin concentrations in other surface soil samples were less than standard laboratory detection limits.

The following summarizes the nature and extent of pesticide detections:

- Pesticide concentrations exceeding screening criteria occurred most frequently in four of the surface soil samples, indicating either localized use or the disposal of small quantities of pesticides.
- Pesticide concentrations detected at Site 3 did not exceed screening criteria for direct exposures to human receptors, but did exceed SSLs for the soil-to-groundwater migration pathway and/or ESVs for ecological receptors. Pesticides were not detected in groundwater.

PCB concentrations reported for Site 3 surface soil samples were less than standard laboratory detection limits.

4.2.2.4 Herbicides

Dinoseb was detected in one surface soil sample, 03SS0601, at a concentration of 0.14 µg/kg, which is less than the screening criteria. The dinoseb concentration reported for the field duplicate of this sample was less than the detection limit. Other herbicide concentrations reported for Site 3 surface soil samples were less than standard laboratory detection limits

4.2.2.5 Inorganics

Metals were frequently detected in the 10 soil samples collected at Site 3 (see Table 4-2).

Arsenic was the only metal detected in Site 3 surface soil samples at concentrations exceeding human health direct exposure criteria (TRGs and PRG). Arsenic was detected in each of the 10 soil samples. Arsenic concentrations in two samples, 5.2 milligrams per kilogram (mg/kg) at 03SS0701 and 6.0 mg/kg at 03SS0901, were greater than the restricted TRG (3.82 mg/kg). Arsenic concentrations in other surface soil samples ranged from 1.1 to 2.7 mg/kg, greater than the unrestricted TRG (0.426 mg/kg), PRG (0.39 mg/kg), and SSL for soil to groundwater (0.29 mg/kg).

Petry and Switzer (Petry and Switzer, 2001) evaluated the arsenic concentrations in different soil resource areas. Samples of soils collected from Coastal Flatwoods areas had arsenic concentrations ranging from 0.37 to 14.78 mg/kg, with a mean arsenic concentration of 4.42 mg/kg. The detected concentrations of arsenic in the Site 3 soil samples are within this range of concentrations and all but two are less than the mean concentration, suggesting that arsenic concentrations at Site 3 are probably not attributable to releases from landfilled materials.

Aluminum was detected in all surface soil samples collected at Site 3 at concentrations ranging from 2,670 to 7,300 mg/kg, all greater than the SSL for soil to groundwater (8.3 mg/kg) and the ESV (50 mg/kg). These aluminum concentrations are an order of magnitude less than the human health direct exposure screening criteria (unrestricted TRG of 78,200 mg/kg and PRG of 75,000 mg/kg). No trend of aluminum distribution in Site 3 surface soil is apparent.

Iron was detected in all surface soil samples collected at Site 3 at concentrations ranging from 2,560 to 12,900 mg/kg, all greater than the ESV (200 mg/kg). Iron concentrations in 9 of the 10 samples were an order of magnitude less than the human health direct exposure screening criteria (unrestricted TRG of 23,500 mg/kg and PRG of 55,000 mg/kg). No trend of iron distribution in Site 3 surface soil is apparent.

Chromium was detected in all surface soil samples collected at Site 3 at concentrations ranging from 2.8 to 10.6 mg/kg, all greater than the SSL for soil to groundwater (2.1 mg/kg). These chromium concentrations are less than half the next higher screening criteria (PRG of 30 mg/kg and ESV of 26 mg/kg). No trend of chromium distribution in Site 3 surface soil is apparent.

Lead was detected in all surface soil samples collected at Site 3, and concentrations in four samples (03SS0101, 03SS0701, 03SS0901, and 03SS1001 and its duplicate) were greater than the ESV (11 mg/kg). Lead concentrations exceeding the ESV ranged from 22.6 to 59.3 mg/kg. Lead concentrations in the other samples ranged from 2.6 to 10.7 mg/kg. These lead concentrations are one or two orders of magnitude less than the human health direct exposure screening criteria (unrestricted TRG of 400 mg/kg and PRG of 400 mg/kg).

Vanadium was detected in all surface soil samples collected at Site 3, and concentrations in six samples were greater than the ESV (7.8 mg/kg). Vanadium concentrations exceeding the ESV ranged from 8.7 to 18.8 mg/kg. Vanadium concentrations in other samples ranged from 5.1 to 7.2 mg/kg. These vanadium concentrations are substantially less than the human health direct exposure screening criteria (unrestricted TRG of 548 mg/kg and PRG of 78 mg/kg).

Zinc was detected in all surface soil samples collected at Site 3, and concentrations in two samples (94.8 mg/kg at 03SS0701 and 255 mg/kg at 03SS0901) were greater than the ESV (46 mg/kg). Zinc concentrations in other samples ranged from 1.7 to 35.0 mg/kg. These zinc concentrations are one or two orders of magnitude less than the human health direct exposure screening criteria (unrestricted TRG of 23,500 mg/kg and PRG of 23,000 mg/kg).

Antimony was reported in one surface soil sample, 03SS0901, at a concentration of 1.2 mg/kg, which is greater than the SSL for soil to groundwater (0.27 mg/kg) and the ESV (0.27 mg/kg). This antimony concentration is an order of magnitude less than the human health direct exposure screening criteria (unrestricted TRG of 31.3 mg/kg and PRG of 31 mg/kg). Antimony concentrations in other surface soil samples were less than standard laboratory detection limits.

Cadmium was reported in one surface soil sample, 03SS0901, at a concentration of 0.91 mg/kg, which is greater than the SSL for soil to groundwater (0.38 mg/kg) and the ESV (0.36 mg/kg). This cadmium concentration is two orders of magnitude less than the human health direct exposure screening criteria (unrestricted TRG of 39.1 mg/kg and PRG of 37 mg/kg). Cadmium concentrations in other surface soil samples were less than standard laboratory detection limits.

Selenium was reported in one surface soil sample, 03SS0401, at a concentration of 0.68 mg/kg, which is greater than the SSL for soil to groundwater (0.26 mg/kg) and the ESV (0.52 mg/kg). This selenium concentration is almost three orders of magnitude less than the human health direct exposure screening criteria (unrestricted TRG of 391 mg/kg and PRG of 390 mg/kg). Selenium concentrations in other surface soil samples were less than standard laboratory detection limits.

Cobalt was detected in three surface soil samples at concentrations greater than the SSL for soil to groundwater (0.17 mg/kg).

03SS0501	1.5 mg/kg
03SS0901	1.1 mg/kg
03SS1001/D	1.4/2.1 mg/kg

These cobalt concentrations are three orders of magnitude less than the human health direct exposure screening criteria (unrestricted TRG of 4,690 mg/kg and PRG of 1,400 mg/kg) and an order of magnitude less than the ESV (13 mg/kg). Cobalt concentrations in other surface soil samples were less than standard laboratory detection limits.

Barium and manganese were detected in all surface soil samples at concentrations less than screening criteria. Other metals and cyanide were detected in one or more of the soil samples at concentrations less than the screening criteria.

The following summarizes the nature and extent of metals detections:

- Arsenic concentrations are consistent with regional background levels that have been significantly influenced by industrial and agricultural activities (Pettry and Switzer, 2001).
- Metals concentrations exceeding human health screening criteria were limited to arsenic; however, the reported arsenic concentrations were within concentration ranges typical for Mississippi Coastal Plain soil.
- Aluminum, iron, chromium, lead, vanadium, and zinc were detected in all Site 3 surface soil samples at concentrations less than screening criteria for direct exposures to human receptors, but greater than SSLs for the soil-to-groundwater migration pathway and/or ESVs for ecological receptors.
- Antimony, cadmium, cobalt, and selenium were detected in at least one surface soil sample at concentrations less than screening criteria for direct exposures to human receptors, but greater than SSLs for the soil-to-groundwater migration pathway and/or ESVs for ecological receptors.
- The nature and extent of metals in surface soil at Site 3 are consistent with the base operational history (lack of significant metal working/refinishing).

4.2.2.6 Summary of Surface Soil Analytical Results

Contamination detected in surface soil at Site 3 appears to have resulted from typical golf course maintenance activities and the addition of fill from an unknown source during golf course construction. Site 3 RI surface soil analytical results are summarized as follows:

- VOCs – Detected VOC concentrations were less than screening criteria.
- SVOCs – PAH concentrations exceeding screening criteria were limited to three surface soil sample locations.
- Pesticides and PCBs – Pesticides were detected at concentrations less than direct exposure human health criteria. The pesticide concentrations were consistent with use and/or disposal of small quantities of DDT, BHC isomers, and dieldrin. PCBs were not detected.

- Herbicides – Herbicides were not detected, including the primary herbicide orange (HO) ingredients, 2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), indicating that HO was not significantly used or disposed at Site 3. This is consistent with the period of landfill operations at Site 3 and storage of HO at the base.
- Inorganics – Arsenic was detected in each of the 10 surface soil samples and was the only metal detected in surface soil at concentrations exceeding human health direct exposure criteria. The reported arsenic concentrations were within concentration ranges typical for Mississippi Coastal Plain soil. Concentrations of other metals detected at Site 3 did not exceed screening criteria for direct exposures to human receptors, but did exceed SSLs for the soil-to-groundwater migration pathway and/or ESVs for ecological receptors.

The results of the soil analytical program are consistent with the containment strategy of the presumptive remedy, and the direct observation of the field samples confirmed the waste disposal area defined by the geophysical investigation.

4.2.3 Subsurface Soil

One subsurface soil sample was collected from a depth of 3 to 8 feet bls at each of the 10 soil borings at Site 3 and analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, Appendix IX chlorinated herbicides, and TAL inorganics. The majority of the samples were collected from the saturated zone at the bottom of the landfill material. Analytes detected in subsurface soil samples are summarized in Table 4-3, and results exceeding screening criteria are presented on Figure 4-3.

4.2.3.1 Volatile Organics

Several VOCs, including ketones and CVOCs, were detected in subsurface soil samples from Site 3 at concentrations less than direct exposure screening criteria (TRGs and PRGs) and SSLs for the soil-to-air pathway (see Table 4-3). Vinyl chloride was detected in the subsurface soil sample collected at 03SB03 at a concentration of 3.7 µg/kg, which exceeds the soil-to-groundwater SSL of 0.67 µg/kg. The presence of CVOCs is consistent with waste disposal practices and base operations that have included the use of solvents in degreasing activities, particularly the degreasing of new military equipment from manufacturers. Ketones (2-butanone and 4-methyl-2-pentanone), cis 1,2-DCE, and carbon disulfide were detected in subsurface soil samples at concentrations significantly less than screening criteria.

TABLE 4-3
SUBSURFACE SOIL- SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

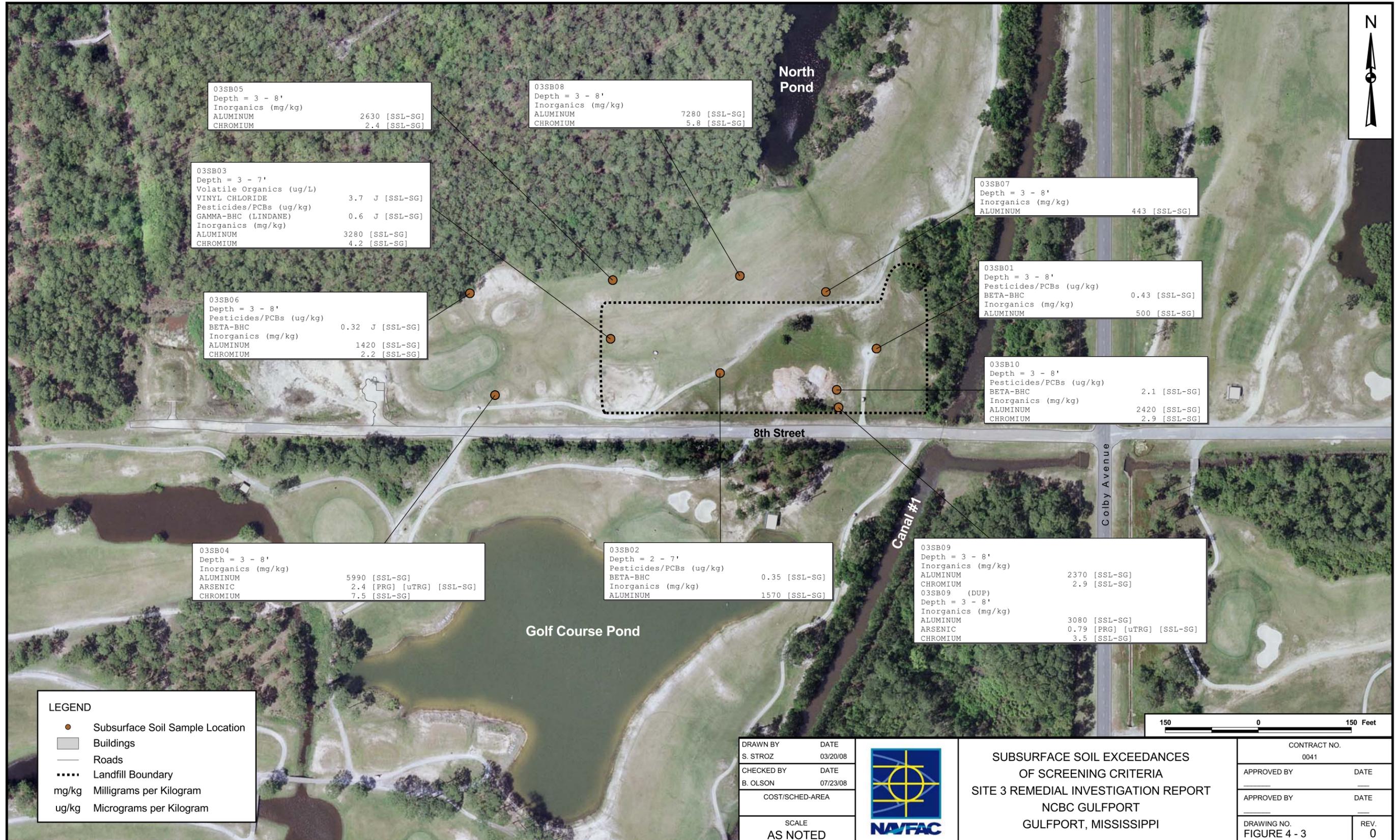
Sample Location	MDEQ Tier 1 TRG Unrestricted	MDEQ Tier 1 TRG Restricted	USEPA Region IX PRG	USEPA SSL Soil to Air	USEPA SSL Soil to Groundwater	03SB01 03SB0101 3 - 8 08/14/07	03SB02 03SB0201 2 - 7 08/14/07	03SB03 03SB0301 3 - 7 08/15/07	03SB04 03SB0401 3 - 8 08/15/07	03SB05 03SB0501 3 - 8 08/15/07	03SB06 03SB0601 3 - 8 08/16/07
Volatile Organics (µg/kg)											
2-BUTANONE	8450	8450	2200000	24000000	4400	1.6 U	1.6 U	1.4 U	1.5 U	1.5 U	1.5 U
4-METHYL-2-PENTANONE	626000	16300000	530000	2700000	620	0.65 U	0.64 U	0.58 U	0.62 U	0.64 U	0.62 U
CARBON DISULFIDE	797	797	36000	720000	1500	1.5 U	1.4 U	1.3 U	1.4 U	1.4 U	6
CIS-1,2-DICHLOROETHENE	78200	1210000	4300	NA	20	1.4 U	1.3 U	1.2 U	1.3 U	1.3 U	3.2 J
VINYL CHLORIDE	426	939	79	280	0.67	1.2 U	1.2 U	3.7 J	1.2 U	1.2 U	1.2 U
Semivolatile Organics (µg/kg)											
BIS(2-ETHYLHEXYL)PHTHALATE	45600	409000	35000	NA	180000	41 U	42 U	42 U	44 U	44 U	43 U
CHRYSENE	87500	784000	15000	NA	160	35 U	46 J	36 U	38 U	37 U	37 U
Pesticides/PCBs (µg/kg)											
4,4'-DDD	2660	23800	2400	NA	710	0.15 U	1	1.2	0.16 U	0.16 U	0.16 U
4,4'-DDE	1880	16800	1700	NA	2200	0.15 U	0.34 J	0.53 J	0.16 U	0.16 U	0.16 U
4,4'-DDT	1880	16800	1700	750000	1300	1.7 J	0.15 U	0.79	0.16 U	0.16 U	0.23 J
BETA-BHC	355	3180	320	6000	0.13	0.43	0.35	0.1 U	0.11 U	0.11 U	0.32 J
GAMMA-BHC (LINDANE)	491	4400	440	NA	0.47	0.097 U	0.41	0.6 J	0.11 U	0.11 U	0.1 U
GAMMA-CHLORDANE	1820	12300	1600	72000	480	0.49	0.1 U	0.21 J	0.35	0.11 U	0.1 U
HEPTACHLOR	127	195	110	4100	1100	0.097 U	0.1 U	0.1 U	0.11 U	0.11 U	0.1 U
HEPTACHLOR EPOXIDE	70.2	629	53	4700	33	0.69	0.23 J	0.1 U	0.11 U	0.11 U	0.1 U
Inorganics (mg/kg)											
ALUMINUM	78200	2040000	75000	7090000	8.3	500	1570	3280	5990	2630	1420
ARSENIC	0.426	3.82	0.39	769	0.29	0.61 U	0.68 U	0.7 U	2.4	0.67 U	0.75 U
BARIUM	5480	14300	15000	709000	82	2.5	4.5	12.3	24.1	4.4	2.8
CALCIUM	NA	NA	NA	NA	NA	204 U	226 U	378	235 U	224 U	251 UJ
CHROMIUM	227	381	30	276	2.1	1	1.7	4.2	7.5	2.4	2.2
COPPER	3130	8170	3100	NA	560	1.0 U	1.1 U	1.2 U	1.3	1.1 U	1.3 U
IRON	23500	613000	55000	NA	NA	107	126	729	6640	390	766
LEAD	400	1700	400	NA	NA	1.2 U	1.1 U	5.9	4.8	2.2	1.7 U
MAGNESIUM	NA	NA	NA	NA	NA	204 U	226 U	233 U	238	224 U	251 U
MANGANESE	1560	4080	1800	70900	110	0.88	0.74	3.4	4.4	1.8	1.9
MERCURY	10	61.3	23	NA	0.1	0.014 U	0.014 U	0.024	0.014 U	0.017 U	0.014 U
NICKEL	1560	4080	1600	NA	14	1.0 U	1.1 U	1.2 U	1.2 U	1.1 U	1.3 U
VANADIUM	548	1430	78	NA	260	1.0 U	1.1 U	4.7	13.8	3.5	2
ZINC	23500	61300	23000	NA	680	1.0 U	1.1 U	7.7	5.2	1.2	1.3 U

TABLE 4-3
SUBSURFACE SOIL- SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Sample Location Sample ID Sample Depth Sample Date	MDEQ	MDEQ	USEPA	USEPA	USEPA	03SB07	03SB08	03SB09		03SB10
	Tier 1 TRG Unrestricted	Tier 1 TRG Restricted	Region IX PRG	SSL Soil to Air	SSL Soil to Groundwater	03SB0701 3 - 8 08/16/07	03SB0801 3 - 8 08/16/07	03SB0901 3 - 8 08/17/07	03SB0901-D 3 - 8 08/17/07	03SB1001 3 - 8 08/17/07
Volatile Organics (µg/kg)										
2-BUTANONE	8450	8450	2200000	24000000	4400	1.9 J	1.3 U	1.6 U	1.6 U	1.6 U
4-METHYL-2-PENTANONE	626000	16300000	530000	2700000	620	1.1 J	0.54 U	0.65 U	0.66 U	0.64 U
CARBON DISULFIDE	797	797	36000	720000	1500	1.4 U	1.2 U	1.4 U	1.5 U	1.4 U
CIS-1,2-DICHLOROETHENE	78200	1210000	4300	NA	20	1.3 U	1.1 U	1.3 U	1.4 U	1.3 U
VINYL CHLORIDE	426	939	79	280	0.67	1.2 U	1 U	1.2 U	1.3 U	1.2 U
Semivolatile Organics (µg/kg)										
BIS(2-ETHYLHEXYL)PHTHALATE	45600	409000	35000	NA	180000	480	43 U	44 U	45 U	43 U
CHRYSENE	87500	784000	15000	NA	160	36 U	36 U	38 U	38 U	37 U
Pesticides/PCBs (µg/kg)										
4,4'-DDD	2660	23800	2400	NA	710	0.15 U	0.15 U	0.16 U	0.16 U	0.16 U
4,4'-DDE	1880	16800	1700	NA	2200	0.15 U	0.15 U	0.16 U	0.16 U	0.16 U
4,4'-DDT	1880	16800	1700	750000	1300	0.15 U	0.15 U	0.48 J	0.16 U	0.16 U
BETA-BHC	355	3180	320	6000	0.13	0.098 U	0.1 U	0.1 U	0.11 U	2.1
GAMMA-BHC (LINDANE)	491	4400	440	NA	0.47	0.098 U	0.1 U	0.1 U	0.11 U	0.1 U
GAMMA-CHLORDANE	1820	12300	1600	72000	480	0.098 U	0.2 J	0.1 U	0.11 U	0.1 U
HEPTACHLOR	127	195	110	4100	1100	0.098 U	0.1 U	0.1 U	0.11 U	0.55
HEPTACHLOR EPOXIDE	70.2	629	53	4700	33	0.098 U	0.1 U	0.1 U	0.11 U	0.78
Inorganics (mg/kg)										
ALUMINUM	78200	2040000	75000	7090000	8.3	443	7280	2370	3080	2420
ARSENIC	0.426	3.82	0.39	769	0.29	0.72 U	0.69 U	0.7 U	0.79	0.73 U
BARIUM	5480	14300	15000	709000	82	5	7.5	3	3.9	7.2
CALCIUM	NA	NA	NA	NA	NA	239 UJ	231 UJ	233 UJ	260 J	243 UJ
CHROMIUM	227	381	30	276	2.1	1.5	5.8	2.9	3.5	2.9
COPPER	3130	8170	3100	NA	560	1.2 U	1.2 U	1.2 U	1.1 U	1.2 U
IRON	23500	613000	55000	NA	NA	558	2230	812	1090	874
LEAD	400	1700	400	NA	NA	1.0 U	3	1.9 U	2.3	2.1 U
MAGNESIUM	NA	NA	NA	NA	NA	239 U	231 U	233 U	224 U	243 U
MANGANESE	1560	4080	1800	70900	110	1.6	2.6	2.6	3.2	3.1
MERCURY	10	61.3	23	NA	0.1	0.015 U	0.013 U	0.015 U	0.017 U	0.014 U
NICKEL	1560	4080	1600	NA	14	1.2 U	1.3	1.2 U	1.1 U	1.2 U
VANADIUM	548	1430	78	NA	260	1.2 U	8.3	3.3	4.3	3.5
ZINC	23500	61300	23000	NA	680	1.2 U	2.2	4	5	6.7

NOTES:

MDEQ = Mississippi Department of Environmental Quality
 TRG = Target Remediation Goal
 USEPA = United States Environmental Protection Agency
 PRG = Preliminary Remediation Goal
 SSL = Soil Screening Level
 µg/kg = micrograms per kilogram
 mg/kg = milligrams per kilogram
 U = Concentration less than value shown
 J = Estimated concentration
 Values in bold are positive detections
 Bold and shaded values exceed one or more screening criteria
 NA = No criteria available



4.2.3.2 Semivolatile Organics

Chrysene and bis(2-ethylhexyl) phthalate were each detected in one subsurface soil sample at concentrations less than screening criteria.

4.2.3.3 Pesticides/PCBs

Pesticides were detected at very low levels in 8 of the 10 subsurface soil samples collected at Site 3. The concentrations for pesticides were less than direct exposure human health criteria (TRGs and PRGs) and SSLs for the soil-to-air migration pathway. Concentrations of two BHC isomers exceeded SSLs for the soil-to-groundwater migration pathway.

Beta-BHC was detected at the following four subsurface soil sample locations at concentrations greater than the SSL for soil to groundwater (0.13 µg/kg):

- 03SB0101 at 0.43 µg/kg
- 03SB0201 at 0.35 µg/kg
- 03SB0601 at 0.32 µg/kg
- 03SB1001 at 2.1 µg/kg

Gamma-BHC was detected in 03SB0301 at a concentration of 0.6 µg/kg, which is greater than the SSL for soil to groundwater (0.47 µg/kg). The other detection of gamma-BHC, 0.41 µg/kg at 03SB0201, was less than screening criteria.

PCB concentrations for Site 3 subsurface soil samples were less than standard laboratory detection limits.

4.2.3.4 Herbicides

Herbicide concentrations for Site 3 subsurface soil samples were less than standard laboratory detection limits

4.2.3.5 Inorganics

Metals were frequently detected in the 10 subsurface soil samples collected at Site 3 (see Table 4-3).

Arsenic was the only metal detected in subsurface soil samples collected at Site 3 with concentrations exceeding human health direct exposure criteria (TRGs and PRG). Arsenic was detected in two samples

(03SB0401 at 2.4 mg/kg and 03SB0901D at 0.79 mg/kg) at concentrations greater than the unrestricted TRG (0.426 mg/kg), PRG (0.39 mg/kg), and SSL for soil to groundwater (0.29 mg/kg).

The arsenic concentration reported for 03SB0901, of which 03SB0901D was the field duplicate, and arsenic concentrations in other subsurface soil samples were less than standard laboratory detection limits. The detected concentrations of arsenic in the Site 3 soil samples are within the range of concentrations for Coastal Flatwoods areas (Pettry and Switzer, 2001) and are less than the mean concentration.

Aluminum was detected in all subsurface soil samples collected at Site 3 at concentrations ranging from 443 to 7,280 mg/kg, all greater than the SSL for soil to groundwater (8.3 mg/kg). These aluminum concentrations are an order of magnitude less than human health direct exposure screening criteria (unrestricted TRG of 78,200 mg/kg and PRG of 75,000 mg/kg). No trend of aluminum distribution in Site 3 subsurface soil is apparent.

Chromium was detected in all subsurface soil samples collected at Site 3, and concentrations in the following seven samples were greater than the SSL for soil to groundwater (2.1 mg/kg):

- 03SB0301 at 4.2 mg/kg
- 03SB0401 at 7.5 mg/kg
- 03SB0501 at 2.4 mg/kg
- 03SB0601 at 2.2 mg/kg
- 03SB0801 at 5.8 mg/kg
- 03SB0901 (and duplicate) at 2.9 mg/kg (3.5 mg/kg)
- 03SB1001 at 2.9 mg/kg

These chromium concentrations are less than half the next higher screening criteria (PRG at 30 mg/kg and ESV at 26 mg/kg). Chromium concentrations that exceeded the SSL were detected at subsurface soil sample locations in closest proximity to the waste disposal area, which suggests that landfill operations have resulted in elevated chromium concentrations, albeit at very low levels when compared to other screening criteria.

Barium, iron, and manganese were detected in all subsurface soil samples at concentrations less than screening criteria. Other metals were detected in one or more subsurface soil samples at concentrations less than screening criteria.

4.2.3.6 Summary of Subsurface Soil Analytical Results

Site 3 RI subsurface soil analytical results are summarized as follows:

- VOCs - Concentrations of VOCs in subsurface soil were less than direct exposure screening criteria and SSLs for the soil-to-air pathway. Vinyl chloride was detected in one subsurface soil sample at a concentration greater than the SSL for soil to groundwater. The presence of CVOCs is consistent with waste disposal practices and base operations that have included the use of solvents in degreasing activities, particularly degreasing of new military equipment from manufacturers.
- SVOCs - Detected SVOC concentrations in subsurface soil samples were less than screening criteria.
- Pesticides and PCBs - Pesticides were detected in subsurface soil samples at concentrations less than direct exposure human health criteria. The pesticide concentrations were consistent with the use and/or disposal of small quantities of BHC isomers. PCBs were not detected in subsurface soil samples.
- Herbicides - Herbicides were not detected in subsurface soil samples, including the primary HO ingredients (2,4-D and 2,4,5-T), indicating that HO was not significantly used or disposed at Site 3, which is consistent with the time frame of landfill operations at Site 3 and the storage of HO at the base.
- Inorganics - Arsenic was detected in two subsurface soil samples and was the only metal detected in subsurface soil at concentrations exceeding human health direct exposure criteria. However, arsenic concentrations were within concentration ranges typical for Mississippi Coastal Plain soil. Concentrations of aluminum and chromium in subsurface soil did not exceed screening criteria for direct exposures to human receptors but did exceed SSLs for the soil-to-groundwater migration pathway.

The results of the subsurface soil analytical program are consistent with the containment strategy of the presumptive remedy, and the direct observation of the field samples confirmed the waste disposal area defined by the geophysical investigation.

4.3 GROUNDWATER

Groundwater samples were collected during two phases of investigation that included DPT groundwater sampling for VOC analysis and monitoring well sampling. DPT groundwater samples were analyzed at

an on-site mobile laboratory to quantify concentrations of VOCs identified in the passive soil-gas survey. Monitoring wells were sampled for a full suite of analytes to further characterize groundwater conditions at the site.

The presumptive remedy strategy for Site 3 includes containment of the buried waste via a soil landfill cover for the waste disposal area. The goal of the groundwater sampling program was to provide the data necessary to answer the following questions:

- Is the waste observed in the landfill consistent with the use of the presumptive remedy?
- Do site dynamics support a containment strategy?
- Are there hot spots that require additional delineation?
- Will the hot spots require additional treatment?
- Should additional non-presumptive remedies be included in the containment alternatives?

The results of the groundwater investigations are discussed below.

4.3.1 DPT Groundwater Investigation

Groundwater samples were collected from DPT locations (see Figure 4-4) and analyzed for selected VOCs (see Table 4-4). The samples were collected north of 8th Street from locations across the entire waste disposal area, as well as upgradient, cross-gradient, and downgradient of the landfill. The initial sample collection focused on VOC hot spots identified during the passive soil-gas survey and subsequent locations were sampled to refine the delineation of the CVOC plume. Vertically, groundwater samples were collected from depths ranging from 6 to 45 feet bls.

- The CVOC plume includes the following primary constituents: vinyl chloride, cis-1,2-DCE, trans-1,2-DCE, and TCE at concentrations greater than screening criteria.
- The maximum concentrations of CVOCs in DPT groundwater samples were detected at the hot spots identified during the passive soil gas survey. In the source area, the maximum concentrations of the primary constituents in 03SB02 are as follows (TRGs are in parentheses):
 - Vinyl chloride: 27.8 micrograms per liter ($\mu\text{g/L}$) (2 $\mu\text{g/L}$)
 - cis-1,2-DCE: 320 $\mu\text{g/L}$ (70 $\mu\text{g/L}$)
 - TCE: 15 $\mu\text{g/L}$ (5 $\mu\text{g/L}$)

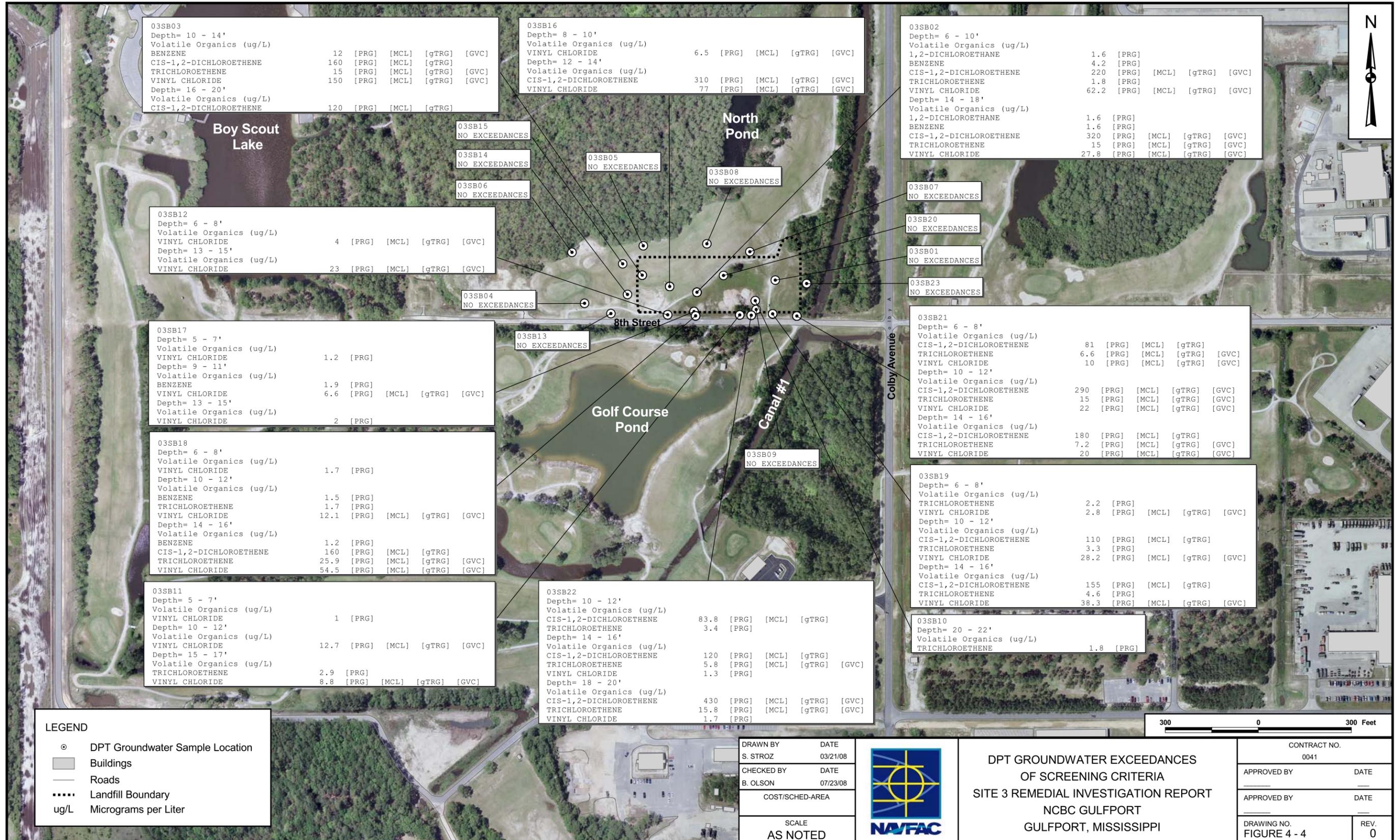


TABLE 4-4
DPT GROUNDWATER - SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Sample Location Sample ID Sample Depth Sample Date	Direct Contact Exposures			Migration Pathways USEPA Groundwater Volatilization Criteria	03SB01			03SB02			03SB03			03SB04	
	USEPA Region IX PRG	MDEQ Groundwater Criteria	USEPA MCLs		03GP0101 6 - 8 10/10/06	03GP0102 12 - 16 10/10/06	03GP0103 20 - 24 10/10/06	03GP0201 6 - 10 10/11/06	03GP0202 14 - 18 10/11/06	03GP0203 34 - 38 10/11/06	03GP0301 10 - 14 10/11/06	03GP0302 16 - 20 10/11/06	03GP0303 40 - 44 10/11/06	03GP0402 14 - 16 10/11/06	03GP0403 42 - 44 10/11/06
Volatile Organics (µg/L)															
1,1-DICHLOROETHENE	340	7	7	190	1 U	1 U	1 U	1 U	1 U	10 U	10 U	10 U	1 U	1 U	
1,2,4-TRICHLOROBENZENE	7.2	70	70	3400	1 U	1 U	1 U	1.2	1 U	10 U	10 U	10 U	1 U	1 U	
1,2-DICHLOROETHANE	0.12	5	5	5	1 U	1 U	1 U	1.6	1.6	10 U	10 U	10 U	1 U	1 U	
ACETONE	5500	608	NA	220000	100 U	100 U	100 U	100 U	100 U	1000 U	1000 U	1000 U	100 U	100 U	
BENZENE	0.35	5	5	5	1 U	1 U	1 U	4.2	1.6	10 U	12	10 U	1 U	1 U	
CHLOROBENZENE	90	100	100	390	1 U	1 U	1 U	1 U	1 U	10 U	10 U	10 U	1 U	1 U	
CHLOROMETHANE	160	1.43	NA	6.7	1 U	1 U	1 U	1 U	1 U	10 U	10 U	10 U	1 U	1 U	
CIS-1,2-DICHLOROETHENE	61	70	70	210	1 U	1 U	1 U	220	320	31	160	120	1 U	1 U	
METHYLENE CHLORIDE	4.3	5	5	58	1 U	1 U	1 U	1 U	1 U	10 U	10 U	10 U	1 U	1 U	
TRANS-1,2-DICHLOROETHENE	110	100	100	180	1 U	1 U	1 U	32.8	87.4	10 U	10 U	10 U	1 U	1 U	
TRICHLOROETHENE	0.028	5	5	5	1 U	1 U	1 U	1.8	15	10 U	15	10 U	1 U	1 U	
VINYL CHLORIDE	0.02	2	2	2	1 U	1 U	1 U	62.2	27.8	10 U	150	10 U	1 U	1 U	

Sample Location Sample ID Sample Depth Sample Date	Direct Contact Exposures			Migration Pathways USEPA Groundwater Volatilization Criteria	03SB05			03SB06			03SB07		
	USEPA Region IX PRG	MDEQ Groundwater Criteria	USEPA MCLs		03GP0501 10 - 12 10/12/06	03GP0502 16 - 18 10/12/06	03GP0503 43 - 45 10/12/06	03GP0601 8 - 12 10/12/06	03GP0602 16 - 18 10/12/06	03GP0603 40 - 44 10/12/06	03GP0701 7 - 9 10/13/06	03GP0702 11 - 13 10/13/06	03GP0703 15 - 17 10/13/06
Volatile Organics (µg/L)													
1,1-DICHLOROETHENE	340	7	7	190	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	7.2	70	70	3400	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	0.12	5	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ACETONE	5500	608	NA	220000	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
BENZENE	0.35	5	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROBENZENE	90	100	100	390	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROMETHANE	160	1.43	NA	6.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	61	70	70	210	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
METHYLENE CHLORIDE	4.3	5	5	58	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	110	100	100	180	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	0.028	5	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
VINYL CHLORIDE	0.02	2	2	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

Sample Location Sample ID Sample Depth Sample Date	Direct Contact Exposures			Migration Pathways USEPA Groundwater Volatilization Criteria	03SB08				03SB09			03SB10		
	USEPA Region IX PRG	MDEQ Groundwater Criteria	USEPA MCLs		03GP0801 8 - 10 10/13/06	03GP0802 13 - 15 10/13/06	03GP0803 18 - 20 10/13/06	03GP0804 38 - 40 10/13/06	03GP0901 6 - 8 10/13/06	03GP0902 11 - 13 10/13/06	03GP0903 16 - 18 10/13/06	03GP1001 8 - 10 10/13/06	03GP1002 12 - 14 10/13/06	03GP1003 16 - 18 10/13/06
Volatile Organics (µg/L)														
1,1-DICHLOROETHENE	340	7	7	190	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	7.2	70	70	3400	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	0.12	5	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ACETONE	5500	608	NA	220000	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
BENZENE	0.35	5	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROBENZENE	90	100	100	390	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROMETHANE	160	1.43	NA	6.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	61	70	70	210	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.3	1 U	3.6
METHYLENE CHLORIDE	4.3	5	5	58	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	110	100	100	180	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	0.028	5	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.8
VINYL CHLORIDE	0.02	2	2	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE 4-4
DPT GROUNDWATER - SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Sample Location	Direct Contact Exposures			Migration Pathways	03SB11				03SB12				03SB13			
	USEPA Region IX PRG	MDEQ Tier 1 TRG	USEPA Tapwater MCL		USEPA Groundwater Volatilization Criteria	03GP1101	03GP1102	03GP1103	03GP1104	03GP1201	03GP1202	03GP1203	03GP1204	03GP1301	03GP1302	03GP1303
Sample ID					5 - 7	10 - 12	15 - 17	38 - 40	6 - 8	13 - 15	34 - 36	39 - 41	8 - 10	12 - 14	36 - 40	
Sample Depth					10/14/06	10/14/06	10/14/06	10/14/06	10/14/06	10/14/06	10/14/06	10/14/06	10/14/06	10/14/06	10/15/06	10/15/06
Sample Date																
Volatile Organics (µg/L)																
1,1-DICHLOROETHENE	340	7	7	190	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	7.2	70	70	3400	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	0.12	5	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ACETONE	5500	608	NA	220000	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
BENZENE	0.35	5	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROBENZENE	90	100	100	390	1 U	1 U	1.1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROMETHANE	160	1.43	NA	6.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	61	70	70	210	4	39.4	34.2	1 U	9.5	20.6	1 U	1 U	1 U	1 U	1 U	1 U
METHYLENE CHLORIDE	4.3	5	5	58	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	110	100	100	180	1 U	1.9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	0.028	5	5	5	1 U	1 U	2.9	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
VINYL CHLORIDE	0.02	2	2	2	1	12.7	8.8	1 U	4	23	1 U	1 U	1 U	1 U	1 U	1 U

Sample Location	Direct Contact Exposures			Migration Pathways	03SB14				03SB15			03SB16				
	USEPA Region IX PRG	MDEQ Groundwater Criteria	USEPA MCLs		USEPA Groundwater Volatilization Criteria	03GP1401	03GP1402	03GP1403	03GP1404	03GP1501	03GP1502	03GP1503	03GP1601	03GP1602	03GP1603	03GP1604
Sample ID					10 - 12	14 - 16	36 - 38	40 - 42	8 - 10	12 - 14	16 - 18	8 - 10	12 - 14	16 - 18	40 - 42	
Sample Depth					10/15/06	10/15/06	10/15/06	10/15/06	10/15/06	10/15/06	10/15/06	10/15/06	10/15/06	10/15/06	10/15/06	
Sample Date																
Volatile Organics (µg/L)																
1,1-DICHLOROETHENE	340	7	7	190	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	7.2	70	70	3400	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	0.12	5	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U
ACETONE	5500	608	NA	220000	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	500 U	100 U	100 U	100 U
BENZENE	0.35	5	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U
CHLOROBENZENE	90	100	100	390	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U
CHLOROMETHANE	160	1.43	NA	6.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	61	70	70	210	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	310	3.9	1 U	1 U
METHYLENE CHLORIDE	4.3	5	5	58	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	110	100	100	180	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U
TRICHLOROETHENE	0.028	5	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	5 U	1 U	1 U	1 U
VINYL CHLORIDE	0.02	2	2	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	6.5	77	1 U	1 U	1 U

Sample Location	Direct Contact Exposures			Migration Pathways	03SB17				03SB18			
	USEPA Region IX PRG	MDEQ Groundwater Criteria	USEPA MCLs		USEPA Groundwater Volatilization Criteria	03GP1701	03GP1702	03GP1703	03GP1704	03GP1801	03GP1802	03GP1803
Sample ID					5 - 7	9 - 11	13 - 15	38 - 40	6 - 8	10 - 12	14 - 16	38 - 40
Sample Depth					10/16/06	10/16/06	10/16/06	10/16/06	10/16/06	10/16/06	10/16/06	10/16/06
Sample Date												
Volatile Organics (µg/L)												
1,1-DICHLOROETHENE	340	7	7	190	1 U	1 U	1 U	1 U	1 U	1 U	2.2	1 U
1,2,4-TRICHLOROBENZENE	7.2	70	70	3400	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	0.12	5	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ACETONE	5500	608	NA	220000	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
BENZENE	0.35	5	5	5	1 U	1.9	1 U	1 U	1 U	1.5	1.2	1 U
CHLOROBENZENE	90	100	100	390	1 U	1 U	1 U	1 U	1 U	1 U	1.1	1 U
CHLOROMETHANE	160	1.43	NA	6.7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	61	70	70	210	5.9	25.4	18.9	1 U	7	50.2	160	1 U
METHYLENE CHLORIDE	4.3	5	5	58	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	110	100	100	180	1 U	2.2	1 U	1 U	1 U	6.8	4.1	1 U
TRICHLOROETHENE	0.028	5	5	5	1 U	1 U	1 U	1 U	1 U	1.7	25.9	1 U
VINYL CHLORIDE	0.02	2	2	2	1.2	6.6	2	1 U	1.7	12.1	54.5	1 U

TABLE 4-4
DPT GROUNDWATER - SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Sample Location Sample ID Sample Depth Sample Date	Direct Contact Exposures			Migration Pathways	03SB19				03SB20			
	USEPA Region IX PRG	MDEQ Groundwater Criteria	USEPA MCLs	USEPA Groundwater Volatilization Criteria	03GP1901 6 - 8 10/16/06	03GP1902 10 - 12 10/16/06	03GP1903 14 - 16 10/16/06	03GP1904 38 - 40 10/16/06	03GP2001 6 - 8 10/16/06	03GP2002 10 - 12 10/16/06	03GP2003 14 - 16 10/16/06	03GP2004 38 - 40 10/16/06
Volatile Organics (µg/L)												
1,1-DICHLOROETHENE	340	7	7	190	1 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	7.2	70	70	3400	1 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	0.12	5	5	5	1 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U
ACETONE	5500	608	NA	220000	100 U	200 U	200 U	100 U	100 U	100 U	100 U	100 U
BENZENE	0.35	5	5	5	1 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U
CHLOROBENZENE	90	100	100	390	1 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U
CHLOROMETHANE	160	1.43	NA	6.7	1 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	61	70	70	210	19.7	110	155	1 U	1 U	1 U	1 U	1 U
METHYLENE CHLORIDE	4.3	5	5	58	1 U	2 U	2 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	110	100	100	180	1.5	13	20.6	1 U	1 U	1 U	1 U	1 U
TRICHLOROETHENE	0.028	5	5	5	2.2	3.3	4.6	1 U	1 U	1 U	1 U	1 U
VINYL CHLORIDE	0.02	2	2	2	2.8	28.2	38.3	1 U	1 U	1 U	1 U	1 U

Sample Location Sample ID Sample Depth Sample Date	Direct Contact Exposures			Migration Pathways	03SB21				03SB22				03SB23			
	USEPA Region IX PRG	MDEQ Groundwater Criteria	USEPA MCLs	USEPA Groundwater Volatilization Criteria	03GP2101 6 - 8 10/16/06	03GP2102 10 - 12 10/16/06	03GP2103 14 - 16 10/16/06	03GP2104 18 - 20 10/16/06	03GP2201 6 - 8 10/17/06	03GP2202 10 - 12 10/17/06	03GP2203 14 - 16 10/17/06	03GP2204 18 - 20 10/17/06	03GP2301 6 - 8 10/17/06	03GP2302 10 - 12 10/17/06	03GP2303 14 - 16 10/17/06	03GP2304 18 - 20 10/17/06
Volatile Organics (µg/L)																
1,1-DICHLOROETHENE	340	7	7	190	5 U	5 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-TRICHLOROBENZENE	7.2	70	70	3400	5 U	5 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-DICHLOROETHANE	0.12	5	5	5	5 U	5 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
ACETONE	5500	608	NA	220000	500 U	500 U	200 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U
BENZENE	0.35	5	5	5	5 U	5 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROBENZENE	90	100	100	390	5 U	5 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CHLOROMETHANE	160	1.43	NA	6.7	5 U	5 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
CIS-1,2-DICHLOROETHENE	61	70	70	210	81	290	180	16.7	17.1	83.8	120	430	1 U	1 U	1 U	1 U
METHYLENE CHLORIDE	4.3	5	5	58	5 U	5 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
TRANS-1,2-DICHLOROETHENE	110	100	100	180	5 U	14	5.7	1 U	1 U	3.2	10.1	10	1 U	1 U	1 U	1 U
TRICHLOROETHENE	0.028	5	5	5	6.6	15	7.2	1 U	1 U	3.4	5.8	15.8	1 U	1 U	1 U	1 U
VINYL CHLORIDE	0.02	2	2	2	10	22	20	1 U	1 U	1 U	1.3	1.7	1 U	1 U	1 U	1 U

NOTES:

MDEQ = Mississippi Department of Environmental Quality
 PRG = Preliminary Remediation Goal
 USEPA = United States Environmental Protection Agency
 MCL = Maximum Contaminant Level
 µg/L = Micrograms per liter
 U = Concentration less than value shown
 J = Estimated concentration
 Values in bold are positive detections
 Bold and shaded values exceed one or more screening criteria
 NA = No criteria available

The maximum concentrations of CVOCs in 03SB03 are as follows:

- Vinyl chloride: 150 µg/L (2 µg/L)
- cis-1,2-DCE: 160 µg/L (70 µg/L)
- TCE: 15 µg/L (5 µg/L)

- The extent of the CVOC exceedances is defined horizontally to the north and west by non-detections in the following DPT samples, as shown on Figure 4-4:

03SB01	03SB04	03SB05	03SB06	03SB07	03SB08
03SB09	03SB13	03SB14	03SB15	03SB20	03SB23

- The maximum areal dimensions of the CVOC plume are approximately 500 feet from Canal No. 1 (east-west) by 200 feet on the northern side of 8th Street (north-south) and roughly coincide with the extent of the landfill. The southern extent of the plume, approximately 80 feet south of 8th Street, was determined during the monitoring well sampling phase of the investigation.
- The vertical extent of the plume is defined by non-detections in deeper DPT samples at the site.
- Given the age of the plume and ratios of the primary constituents (higher concentrations of cis-1,2-DCE and vinyl chloride), natural attenuation of the CVOCs at the site appears to have stalled.
- The vertical extent of the plume appears to be controlled by the presence of the sandy clay layers between 22 and 30 feet bls.

Benzene was detected at DPT location 03SB03 (03GP0301 at 12 µg/L) at concentrations greater than the screening criteria PRG of 0.35 ug/L and the TRG and MCL of 5 µg/L. The benzene concentrations in two samples (03GP0201 at 4.2 µg/L and 03GP0202 at 1.6 µg/L) collected at 03SB02 exceeded the PRG only.

The 1,2-dichloroethane (DCA) concentrations in these samples from 03SB02 (03GP0201 and 03GP0202), both 1.6 µg/L, exceeded the PRG of 0.12 µg/L.

4.3.2 **Monitoring Well Sampling**

Groundwater samples were collected from 24 monitoring wells at Site 3 (GPT-03-08 through GPT-03-31, see Figure 4-5). The majority of the monitoring wells were screened in the shallow aquifer at depths of 30 feet bls or less. The monitoring well groundwater samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides and PCBs, Appendix IX chlorinated herbicides, and TAL inorganics. Analytes detected in monitoring well samples are summarized in Table 4-5.

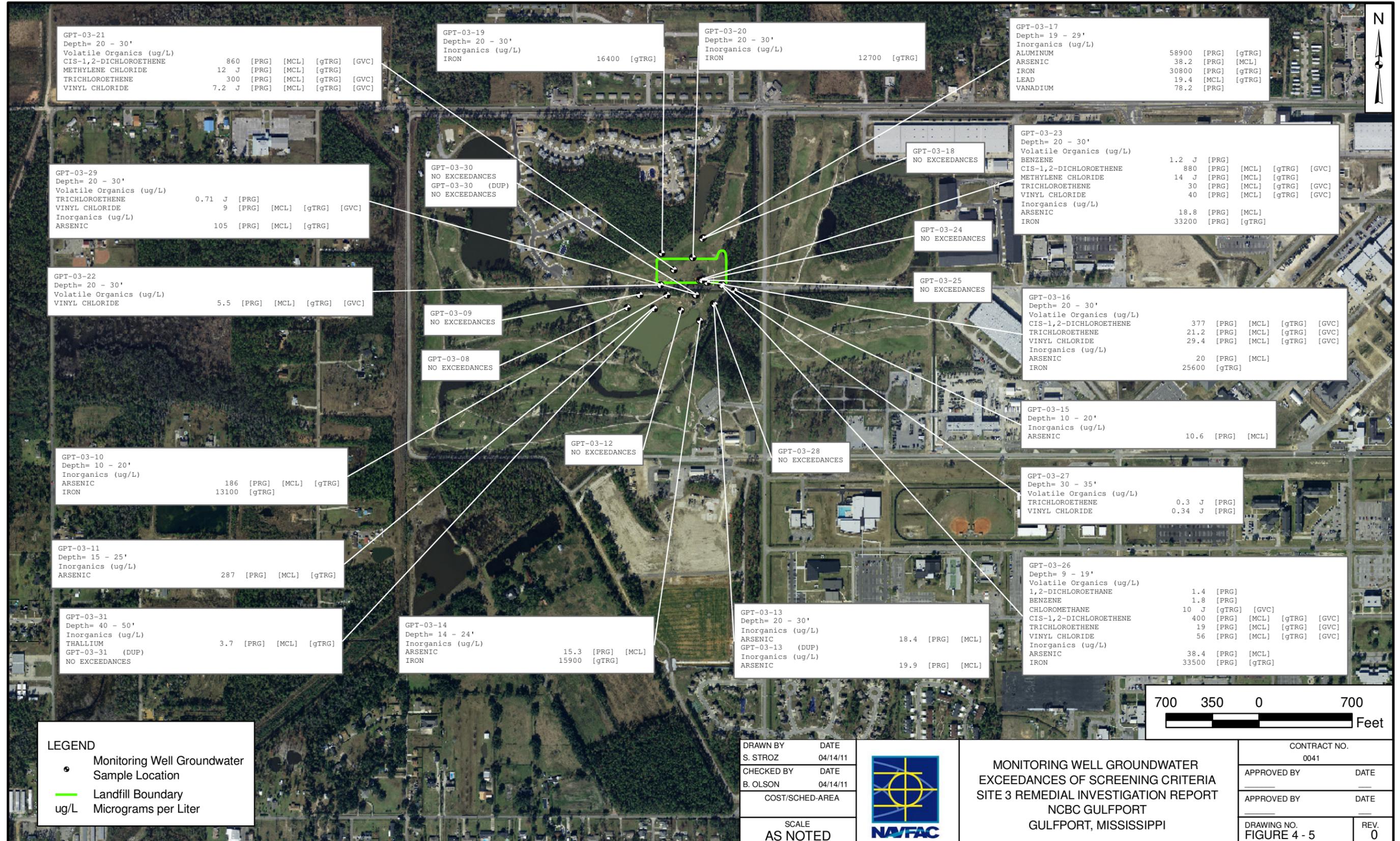


TABLE 4-5
GROUNDWATER - SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Sample Location Sample ID Matrix	Direct Contact Exposures			Migration Pathways USEPA Groundwater Volatilization Criteria	GPT-03-08 GPT-03-08GW-001 GW	GPT-03-09 GPT-03-09GW-001 GW	GPT-03-10 GPT-03-10GW-001 GW	GPT-03-11 GPT-03-11GW-001 GW	GPT-03-12 GPT-03-12GW-001 GW	GPT-03-13 GPT-03-13GW-001 GW
	USEPA Region IX PRG	MDEQ Groundwater Criteria	USEPA MCLs		10 - 20 07/01/07					
Volatile Organics (µg/L)										
1,1-DICHLOROETHENE	340	7	7	190	5 U	5 U	5 U	5 U	5 U	5 U
1,2-DICHLOROETHANE	0.12	5	5	5	5 U	5 U	5 U	5 U	5 U	5 U
ACETONE	5500	608	NA	220000	10 U					
BENZENE	0.35	5	5	5	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROBENZENE	90	100	100	390	5 U	5 U	5 U	5 U	5 U	5 U
CHLOROMETHANE	160	1.43	NA	6.7	5 U	5 U	5 U	5 U	5 U	5 U
CIS-1,2-DICHLOROETHENE	61	70	70	210	5 U	5 U	5 U	5 U	5 U	5 U
METHYLENE CHLORIDE	4.3	5	5	58	5 U	5 U	5 U	5 U	5 U	5 U
TRANS-1,2-DICHLOROETHENE	110	100	100	180	5 U	5 U	5 U	5 U	5 U	5 U
TRICHLOROETHENE	0.028	5	5	5	5 U	5 U	5 U	5 U	5 U	5 U
VINYL CHLORIDE	0.02	2	2	2	5 U	5 U	5 U	5 U	5 U	5 U
Semivolatile Organics (µg/L)										
2,4-DINITROTOLUENE	73	73	NA	NA	4.9 U	4.9 U	0.63 J	4.9 U	4.6 U	4.6 U
CAPROLACTAM	18000	18300	NA	NA	4.9 U	4.9 U	4.8 U	4.9 U	4.6 U	4.6 U
Inorganics (µg/L)										
ALUMINUM	36000	36500	NA	NA	218	348	978	190	654	2830
ARSENIC	0.045	10	10	NA	10 U	3 U	186	287	3 U	18.4
BARIUM	7300	2000	2000	NA	141	80.8	116	127	50	42.5
BERYLLIUM	73	4	4	NA	1 U	1 U	1 U	1.1	1 U	1 U
CALCIUM	NA	NA	NA	NA	4800	10700	19000	12100	6420	2610
CHROMIUM	110	100	100	NA	2 U	2 U	2.2	2 U	2 U	3.7
COBALT	730	2190	NA	NA	5.2	5 U	5 U	5 U	5 U	5 U
COPPER	1500	1300	1300	NA	5 U	5 U	5 U	5 U	5 U	5 U
IRON	26000	11000	NA	NA	3050	3520	13100	3980	3120	4100
LEAD	NA	15	15	NA	1.5 U	1.5 U	1.8	1.5 U	1.5 U	1.5 U
MAGNESIUM	NA	NA	NA	NA	4390	3910	6670	5240	2200	1230
MANGANESE	880	730	NA	NA	86.6	94.7	174	101	46.3	31.8
MERCURY	11	2	2	NA	0.08 UJ					
NICKEL	730	730	NA	NA	7	5 U	5 U	5 U	5 U	5 U
POTASSIUM	NA	NA	NA	NA	1640	1590	1710	1570	1000 U	1000 U
SELENIUM	180	50	50	NA	3 U	3 U	3 U	3 U	3 U	3 U
SODIUM	NA	NA	NA	NA	11800	16200	20400	17000	7630	8960
THALLIUM	2.4	2	2	NA	3 U	3 U	3 U	3 U	3 U	3 U
VANADIUM	36	256	NA	NA	5 U	5 U	5 U	5 U	5 U	5.3
ZINC	11000	11000	NA	NA	28	10.7	28.9	8.7	5 U	12.7

TABLE 4-5
GROUNDWATER - SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPOR
GULFPOR, MISSISSIPPI

Sample Location Sample ID Matrix	Direct Contact Exposures			Migration Pathways USEPA Groundwater Volatilization Criteria	GPT-03-13 GPT-03-13GW-001D GW	GPT-03-14 GPT-03-14GW-001 GW	GPT-03-15 GPT-03-15GW-001 GW	GPT-03-16 GPT-03-16GW-001 GW	GPT-03-17 GPT-03-17GW-001 GW	GPT-03-18 GPT-03-18GW-001 GW
	USEPA Region IX PRG	MDEQ Groundwater Criteria	USEPA MCLs		10 - 20 07/01/07	10 - 20 07/01/07	10 - 20 07/02/07	10 - 20 07/02/07	10 - 20 07/02/07	35-40 09/05/07
Volatile Organics (µg/L)										
1,1-DICHLOROETHENE	340	7	7	190	5 U	5 U	5 U	5 U	5 U	0.42 U
1,2-DICHLOROETHANE	0.12	5	5	5	5 U	5 U	5 U	5 U	5 U	0.15 U
ACETONE	5500	608	NA	220000	10 U	10 U	10 U	13.9	10 U	1.1 U
BENZENE	0.35	5	5	5	5 U	5 U	5 U	5 U	5 U	0.11 U
CHLOROBENZENE	90	100	100	390	5 U	5 U	5 U	5 U	5 U	0.28 U
CHLOROMETHANE	160	1.43	NA	6.7	5 U	5 U	5 U	5 U	5 U	0.4 U
CIS-1,2-DICHLOROETHENE	64	70	70	210	5 U	5 U	5 U	377	5 U	0.44 U
METHYLENE CHLORIDE	4.3	5	5	58	5 U	5 U	5 U	5 U	5 U	0.26 U
TRANS-1,2-DICHLOROETHENE	110	100	100	180	5 U	5 U	5 U	65.7	5 U	0.4 U
TRICHLOROETHENE	0.028	5	5	5	5 U	5 U	5 U	21.2	5 U	0.28 U
VINYL CHLORIDE	0.02	2	2	2	5 U	5 U	5 U	29.4	5 U	0.19 U
Semivolatile Organics (µg/L)										
2,4-DINITROTOLUENE	73	73	NA	NA	4.6 U	4.7 U	4.8 U	4.7 U	5 U	0.48 U
CAPROLACTAM	18000	18300	NA	NA	4.6 U	4.7 U	4.8 U	4.7 U	5 U	0.35 U
Inorganics (µg/L)										
ALUMINUM	36000	36500	NA	NA	2730	3520	30300	81.3	58900	4070
ARSENIC	0.045	10	10	NA	19.9	15.3	10.6	20	38.2	3 U
BARIIUM	7300	2000	2000	NA	43.7	45.9	115	72.7	98.9	116
BERYLLIUM	73	4	4	NA	1 U	1 U	1.2	1 U	2.1	1 U
CALCIUM	NA	NA	NA	NA	2700	3560	6200	88400	3940	6470
CHROMIUM	110	100	100	NA	3.4	3.7	22.7	2 U	53.3	10.2
COBALT	730	2190	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U
COPPER	1500	1300	1300	NA	5 U	5 U	5 U	5 U	13.7	5 U
IRON	26000	11000	NA	NA	4210	15900	10800	25600	30800	5050
LEAD	NA	15	15	NA	1.5 U	2	8.8	1.5 U	19.4	3.3
MAGNESIUM	NA	NA	NA	NA	1270	1690	3040	8510	2720	3000
MANGANESE	880	730	NA	NA	32.7	98.7	83	211	80.4	144
MERCURY	11	2	2	NA	0.08 UJ	0.08 UJ	0.08 UJ	0.08 UJ	0.18 J	0.08 U
NICKEL	730	730	NA	NA	5 U	5 U	10.2	5 U	18.9	5.4
POTASSIUM	NA	NA	NA	NA	1000 U	1250	4100	4580	3360	3670
SELENIUM	180	50	50	NA	3 U	3 U	3 U	3 U	8.2	3 U
SODIUM	NA	NA	NA	NA	9220	5350	7650	15900	12100	38800
THALLIUM	2.4	2	2	NA	3 U	3 U	3 U	3 U	3 U	3 U
VANADIUM	36	256	NA	NA	5 U	5 U	28.6	5 U	73.2	5 U
ZINC	11000	11000	NA	NA	12.3	5 U	41.7	20.6	34.9	18.9

TABLE 4-5
GROUNDWATER - SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Sample Location Sample ID Matrix	Direct Contact Exposures			Migration Pathways USEPA Groundwater Volatilization Criteria	GPT-03-19 GPT-03-19GW-001 GW	GPT-03-20 GPT-03-20GW-001 GW	GPT-03-21 GPT-03-21GW-001 GW	GPT-03-22 GPT-03-22GW-001 GW	GPT-03-23 GPT-03-23GW-001 GW	GPT-03-24 GPT-03-24GW-001 GW
	USEPA Region IX PRG	MDEQ Groundwater Criteria	USEPA MCLs		20-30 08/29/07	19-29 09/04/07	19-29 08/29/07	20-30 08/29/07	14-24 08/29/07	25-35 08/29/07
Volatile Organics (µg/L)										
1,1-DICHLOROETHENE	340	7	7	190	0.13 U	0.42 U	1.3 U	0.13 U	1.3 U	0.13 U
1,2-DICHLOROETHANE	0.12	5	5	5	0.13 U	0.15 U	1.3 U	0.13 U	1.3 U	0.13 U
ACETONE	5500	608	NA	220000	1.7 U	1.1 U	17 U	1.7 U	17 U	1.7 U
BENZENE	0.35	5	5	5	0.12 U	0.11 U	1.2 U	0.14 J	1.2 J	0.12 U
CHLOROBENZENE	90	100	100	390	0.1 U	0.28 U	1 U	0.1 U	1 U	0.1 U
CHLOROMETHANE	160	1.43	NA	6.7	0.28 U	0.6 U	2.8 U	0.28 U	2.8 U	0.28 U
CIS-1,2-DICHLOROETHENE	61	70	70	210	0.14 U	0.44 U	860	6.8	880	0.14 U
METHYLENE CHLORIDE	4.3	5	5	58	0.23 U	0.26 U	12 J	0.23 U	14 J	0.23 U
TRANS-1,2-DICHLOROETHENE	110	100	100	180	0.15 U	0.4 U	1.5 U	0.15 U	79	0.15 U
TRICHLOROETHENE	0.028	5	5	5	0.23 U	0.28 U	300	0.23 U	30	0.23 U
VINYL CHLORIDE	0.02	2	2	2	0.2 U	0.19 U	7.2 J	5.5	40	0.2 U
Semivolatile Organics (µg/L)										
2,4-DINITROTOLUENE	73	73	NA	NA	0.46 U	0.48 U	0.49 U	0.48 U	0.49 U	0.49 U
CAPROLACTAM	18000	18300	NA	NA	0.34 UJ	0.47 J	0.36 UJ	0.35 UJ	0.36 UJ	0.36 UJ
Inorganics (µg/L)										
ALUMINUM	36000	36500	NA	NA	12000 J	2220	401 J	4160 J	50 U	269 J
ARSENIC	0.045	10	10	NA	3 U	3 U	3 U	3 U	18.8	3 U
BARIUM	7300	2000	2000	NA	59.9	47.3	28	75.3	64.7	79
BERYLLIUM	73	4	4	NA	1 U	1 U	1 U	1 U	1 U	1 U
CALCIUM	NA	NA	NA	NA	6570	2830	6670	24600	47400	5750
CHROMIUM	110	100	100	NA	13.2	3.1	2 U	6.4	2 U	2 U
COBALT	730	2190	NA	NA	5 U	5 U	5 U	5 U	5 U	5 U
COPPER	1500	1300	1300	NA	5 U	5 U	5 U	5 U	5 U	5 U
IRON	26000	11000	NA	NA	16400	12700	7350	10500	33200	5670
LEAD	NA	15	15	NA	2.6	1.5 U	1.5 U	1.6	1.5 U	1.5 U
MAGNESIUM	NA	NA	NA	NA	3250	1950	3190	6140	4440	2540
MANGANESE	880	730	NA	NA	160	105	164	149	145	105
MERCURY	11	2	2	NA	0.08 U	0.08 U	0.08 U	0.086 U	0.08 U	0.08 U
NICKEL	730	730	NA	NA	5 U	5 U	5 U	7.8	5 U	5 U
POTASSIUM	NA	NA	NA	NA	1980	1000 U	1640	2780	2540	2560
SELENIUM	180	50	50	NA	3 U	3 U	3 U	3 U	3 U	3 U
SODIUM	NA	NA	NA	NA	18500	10000	13100	63200	16300	23600
THALLIUM	2.4	2	2	NA	3 U	3 U	3 U	3 U	3.3 U	3 U
VANADIUM	36	256	NA	NA	16	5 U	5 U	7.6	5 U	5 U
ZINC	11000	11000	NA	NA	10.1	9.3	5.9	19.6	7.6	5 U

TABLE 4-5
GROUNDWATER - SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Sample Location Sample ID Matrix	Direct Contact Exposures			Migration Pathways USEPA Groundwater Volatilization Criteria	GPT-03-25 GPT-03-25GW-001 GW	GPT-03-26 GPT-03-26GW-001 GW	GPT-03-27 GPT-03-27GW-001 GW	GPT-03-28 GPT-03-28GW-001 GW	GPT-03-29 GPT-03-29GW-001 GW
	USEPA Region IX PRG	MDEQ Groundwater Criteria	USEPA MCLs		30-40 08/29/07	10-20 08/30/07	30-35 08/30/07	34-39 08/30/07	20-30 08/30/07
Volatile Organics (µg/L)									
1,1-DICHLOROETHENE	340	7	7	190	0.13 U	0.7 J	0.13 U	0.13 U	0.13 U
1,2-DICHLOROETHANE	0.12	5	5	5	0.13 U	1.4	0.13 U	0.13 U	0.13 U
ACETONE	5500	608	NA	220000	1.7 U				
BENZENE	0.35	5	5	5	0.12 U	1.8	0.12 U	0.12 U	0.29 J
CHLOROBENZENE	90	100	100	390	0.1 U				
CHLOROMETHANE	160	1.43	NA	6.7	0.28 U	10 J	0.28 U	0.28 U	0.28 U
CIS-1,2-DICHLOROETHENE	61	70	70	210	1.8	400	0.87 J	0.14 U	9.1
METHYLENE CHLORIDE	4.3	5	5	58	0.23 U				
TRANS-1,2-DICHLOROETHENE	110	100	100	180	0.15 U	71	0.15 U	0.15 U	0.16 J
TRICHLOROETHENE	0.028	5	5	5	0.23 U	19	0.3 J	0.23 U	0.71 J
VINYL CHLORIDE	0.02	2	2	2	0.2 U	56	0.34 J	0.2 U	9
Semivolatile Organics (µg/L)									
2,4-DINITROTOLUENE	73	73	NA	NA	0.46 U	0.48 U	0.46 U	0.48 U	0.49 U
CAPROLACTAM	18000	18300	NA	NA	0.34 UJ	0.35 UJ	0.34 UJ	0.35 UJ	0.36 UJ
Inorganics (µg/L)									
ALUMINUM	36000	36500	NA	NA	59.1 J	70.7 J	1300 J	6500 J	1460 J
ARSENIC	0.045	10	10	NA	3 U	38.4	3 U	3 U	105
BARIUM	7300	2000	2000	NA	104	57.9	90.1	69.1	85.5
BERYLLIUM	73	4	4	NA	1 U	1 U	1 U	1 U	1 U
CALCIUM	NA	NA	NA	NA	5860	53400	5280	4250	12200
CHROMIUM	110	100	100	NA	2 U	2 U	7.5	10.3	2.7
COBALT	730	2190	NA	NA	5 U	5 U	5 U	5 U	5 U
COPPER	1500	1300	1300	NA	5 U	5 U	5 U	5 U	5 U
IRON	26000	11000	NA	NA	3590	33500	7610	8090	9540
LEAD	NA	15	15	NA	1.5 U	1.5 U	1.5 U	1.6	1.5 U
MAGNESIUM	NA	NA	NA	NA	2460	4230	1970	1660	4640
MANGANESE	880	730	NA	NA	95.9	124	104	62.2	122
MERCURY	11	2	2	NA	0.08 U	0.08 U	0.089 U	0.082 U	0.08 U
NICKEL	730	730	NA	NA	5 U	5 U	5 U	5 U	5 U
POTASSIUM	NA	NA	NA	NA	2750	2790	2300	1510	1330
SELENIUM	180	50	50	NA	3 U	3 U	3 U	3 U	3 U
SODIUM	NA	NA	NA	NA	24400	17200	20600	10300	14500
THALLIUM	2.4	2	2	NA	3 U	3 U	3 U	3 U	3 U
VANADIUM	36	256	NA	NA	5 U	5 U	5 U	16.7	5 U
ZINC	11000	11000	NA	NA	5 U	10.7	5.6	7	5 U

TABLE 4-5
GROUNDWATER - SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Sample Location Sample ID Matrix	Direct Contact Exposures			Migration Pathways USEPA Groundwater Volatilization Criteria	GPT-03-30 GPT-03-30GW-001 GW	GPT-03-30 GPT-03-30GW-001-D GW	GPT-03-31 GPT-03-31GW-001 GW	GPT-03-31 GPT-03-31GW-001-D GW
	USEPA Region IX PRG	MDEQ Groundwater Criteria	USEPA MCLs		35-40 08/30/07	35-40 08/30/07	40-50 09/05/07	40-50 09/05/07
Volatile Organics (µg/L)								
1,1-DICHLOROETHENE	340	7	7	190	0.13 U	0.13 U	0.42 U	0.42 U
1,2-DICHLOROETHANE	0.12	5	5	5	0.13 U	0.13 U	0.15 U	0.15 U
ACETONE	5500	608	NA	220000	1.7 U	1.7 U	1.1 U	1.1 U
BENZENE	0.35	5	5	5	0.12 U	0.12 U	0.11 U	0.11 U
CHLOROBENZENE	90	100	100	390	0.1 U	0.1 U	0.28 U	0.28 U
CHLOROMETHANE	160	1.43	NA	6.7	0.28 U	0.28 U	0.4 U	0.4 U
CIS-1,2-DICHLOROETHENE	61	70	70	210	0.14 U	0.14 U	0.44 U	0.44 U
METHYLENE CHLORIDE	4.3	5	5	58	0.23 U	0.23 U	0.26 U	0.26 U
TRANS-1,2-DICHLOROETHENE	110	100	100	180	0.15 U	0.15 U	0.4 U	0.4 U
TRICHLOROETHENE	0.028	5	5	5	0.23 U	0.23 U	0.28 U	0.28 U
VINYL CHLORIDE	0.02	2	2	2	0.2 U	0.2 U	0.19 U	0.19 U
Semivolatile Organics (µg/L)								
2,4-DINITROTOLUENE	73	73	NA	NA	0.49 U	0.47 U	0.48 U	0.48 U
CAPROLACTAM	18000	18300	NA	NA	0.36 UJ	0.35 UJ	0.35 U	0.35 U
Inorganics (µg/L)								
ALUMINUM	36000	36500	NA	NA	3270 J	3380 J	153	204
ARSENIC	0.045	10	10	NA	3 U	3 U	3 U	3 U
BARIUM	7300	2000	2000	NA	58.4	56.3	374	378
BERYLLIUM	73	4	4	NA	1 U	1 U	1 U	1 U
CALCIUM	NA	NA	NA	NA	4550	4400	20500	20100
CHROMIUM	110	100	100	NA	4.6	4.9	2 U	2 U
COBALT	730	2190	NA	NA	5 U	5 U	5 U	5 U
COPPER	1500	1300	1300	NA	5 U	5 U	5 U	5 U
IRON	26000	11000	NA	NA	9140	8960	2660	2770
LEAD	NA	15	15	NA	1.5 U	1.5 U	1.5 U	1.5 U
MAGNESIUM	NA	NA	NA	NA	1640	1600	8320	8370
MANGANESE	880	730	NA	NA	99.9	97.4	231	235
MERCURY	11	2	2	NA	0.081 U	0.08 U	0.08 U	0.08 U
NICKEL	730	730	NA	NA	5 U	5 U	5 U	5 U
POTASSIUM	NA	NA	NA	NA	1450	1380	5400	5450
SELENIUM	180	50	50	NA	3 U	3 U	3 U	3 U
SODIUM	NA	NA	NA	NA	12400	11900	34000	34600
THALLIUM	2.4	2	2	NA	3 U	3 U	3.7	3 U
VANADIUM	36	256	NA	NA	8.3	8.4	5 U	5 U
ZINC	11000	11000	NA	NA	5 U	5	5 U	5 U

Notes:
MDEQ = Mississippi Department of Environmental Quality
USEPA = United States Environmental Protection Agency
PRG = Preliminary Remediation Goal
MCL = Maximum Contaminant Level
µg/L = Micrograms per liter
U = Concentration less than value shown
J = Estimated concentration
Values in bold are positive detections
Bold and shaded values exceed one or more screening criteria
NA = No criteria available

4.3.2.1 Volatile Organics

Groundwater samples were collected from monitoring wells across the entire waste disposal area, as well as upgradient, cross-gradient, and downgradient locations, including locations south of 8th Street. Concentrations of parameters detected at least once in monitoring well groundwater samples are presented in Table 4-5.

- The main source area for the CVOC plume appears to be centered near GPT-03-21, shown on Figure 4-5. In this source area, the maximum concentrations of the primary constituents are as follows (the TRG is in parentheses):
 - TCE: 300 µg/L (5 µg/L)
 - cis-DCE: 860 µg/L (70 µg/L)
 - Vinyl chloride: 7.2 J µg/L (2 µg/L)
- Elevated CVOCs were reported in the groundwater sample from downgradient monitoring wells. At GPT-03-23, 200 feet to the east of GPT-03-21, the following CVOC concentrations were reported:
 - TCE: 30 µg/L (5 µg/L)
 - cis-DCE: 880 µg/L (70 µg/L)
 - Vinyl chloride: 40 µg/L (2 µg/L)

The order of magnitude decrease in TCE concentrations indicates that this location is further from the source area. The increase in vinyl chloride concentrations suggests that some reductive dechlorination has occurred.

Further downgradient, monitoring wells GPT-03-16 and GPT-03-26, show continued reduction in TCE concentrations (21.2 and 19 µg/L, respectively) and cis-DCE concentrations (377 and 400 µg/L, respectively). The vinyl chloride concentration reported for GPT-03-26 showed an increase to 56 µg/L.

- Monitoring wells peripheral to the southern edge of the plume, GPT-03-22 and GPT-03-29, had vinyl chloride concentrations greater than screening criteria, 5.5 and 9 µg/L, respectively.
- The vertical extent of the plume is defined by the non-detects in the deeper wells at the site.
- Given the age and ratios of the primary constituents of the plume, natural attenuation at the site appears to have stalled and is not a viable alternative to consider in the FS.

- The vertical extent of the plume appears to be limited by the presence of the sandy clay layers between 22 and 30 feet bls.

4.3.2.2 Semivolatile Organics

Caprolactam and 2,4-dinitrotoluene were each detected in one groundwater sample at concentrations less than the screening criteria. Concentrations of other SVOCs in the groundwater samples were less than standard laboratory detection limits.

4.3.2.3 Pesticides/PCBs

Pesticide and PCB concentrations in the groundwater samples submitted for laboratory analysis were less than standard laboratory detection limits.

4.3.2.4 Herbicides

Herbicide concentrations in the groundwater samples submitted for laboratory analysis were less than standard laboratory detection limits. The lack of chlorinated herbicides is an important finding. Lack of detections of 2,4-D or 2,4,5-T suggest that HO was not disposed of at Site 3, which is consistent with the closing of the landfill operation before HO was stored on the base.

4.3.2.5 Inorganics

Metals were frequently detected in the groundwater samples submitted for inorganic analyses.

Arsenic was detected in 10 of the 24 monitoring well samples collected for site characterization. Arsenic concentrations in three of these samples were an order of magnitude greater than the TRG and MCL of 10 µg/L (see Table 4-5):

GPT-03-10GW-001	186 µg/L
GPT-03-11GW-001	287 µg/L
GPT-03-29GW-001	105 µg/L

Each of these wells is located near the green of the 17th hole of the Pine Bayou Golf Course, which is south of 8th Street and upgradient of the Site 3 landfill. Arsenic concentrations in seven other samples were greater than the TRG and MCL (USEPA, 2006) of 10 µg/L (see Table 4-5):

GPT-03-13GW-001/D	18.4/19.9 µg/L
GPT-03-14GW-001	15.3 µg/L
GPT-03-15GW-001	10.6 µg/L
GPT-03-16GW-001	20 µg/L
GPT-03-17GW-001	38.2 µg/L
GPT-03-23GW-001	18.8 µg/L
GPT-03-26GW-001	38.4 µg/L

The majority of these wells are located downgradient of the 17th green, except for GPT-03-17, which is adjacent to the North Pond, and GPT-03-15, which is east of Canal No. 1. Concentrations in these wells were an order of magnitude less than the concentrations reported in wells located next to the 17th green. Arsenic concentrations in the remaining groundwater samples were less than the laboratory detection limit, typically less than 3 µg/L.

Iron was detected in all of the monitoring well samples collected for site characterization. Iron concentrations in three of these samples were greater than the PRG (26,000 µg/L):

GPT-03-17GW-001	30,800 µg/L
GPT-03-23GW-001	33,200 µg/L
GPT-03-26GW-001	33,500 µg/L

Iron concentrations in five of these samples were less than the PRG and greater than the TRG (11,000 µg/L):

GPT-03-11GW-001	13,100 µg/L
GPT-03-14GW-001	15,900 µg/L
GPT-03-16GW-001	25,600 µg/L
GPT-03-19GW-001	16,400 µg/L
GPT-03-20GW-001	12,700 µg/L

The majority of the monitoring well groundwater samples with iron exceedances also had arsenic exceedances. However, the highest iron concentrations were observed in GPT-03-23 and GPT-03-26,

which are located on the north side of 8th Street and are downgradient of the landfill, and GPT-03-17, which is located adjacent to North Pond and is upgradient of the landfill.

Aluminum was detected in most of the groundwater samples collected from monitoring wells. The aluminum concentration in the groundwater sample collected from GPT-03-17 was 58,900 µg/L, greater than the Tier 1 TRG of 36,500 µg/L and the PRG of 36,000 µg/L (see Table 4-5). This well is located upgradient of the landfill, adjacent to North Pond. Other detected concentrations of aluminum were less than screening criteria.

Lead was detected in eight of the groundwater samples. The lead concentration in the groundwater sample collected from GPT-03-17 was 19.6 µg/L, greater than the Tier 1 TRG and the PRG of 15 µg/L (see Table 4-5). Other detected concentrations of lead were less than screening criteria.

Vanadium was detected in eight of the groundwater samples. The vanadium concentration in the groundwater sample collected from GPT-03-17 was 78.2 µg/L, less than the Tier 1 TRG of 256 µg/L, but greater than the PRG of 36 µg/L (see Table 4-5). Other detected vanadium concentrations were less than screening criteria.

The aluminum, lead, and vanadium exceedances occurred in the same monitoring well, GPT-03-17, which is located adjacent to North Pond, upgradient of the landfill. Arsenic and iron exceedances were also reported in the groundwater sample from this well.

Thallium was only detected in one groundwater sample. The thallium concentration in groundwater sample collected from GPT-03-31 was 3.7 µg/L, greater than the Tier 1 TRG of 2 µg/L and the PRG of 2.4 µg/L. The field duplicate sample result was less than the laboratory detection limit (see Table 4-5).

Barium, calcium, magnesium, manganese, and sodium were detected in all of the monitoring well groundwater samples. Barium and manganese concentrations were less than the screening criteria (TRGs are not established for calcium, magnesium, or sodium). Other metals were detected in one or more of the groundwater samples at concentrations less than the TRGs.

The most notable trend for inorganics in groundwater was the decrease in concentrations with depth. Except for the thallium exceedance reported for MW-31, analytes exceeding screening criteria were limited to samples collected from the monitoring wells screened at depths less than 30 feet bls. This suggests that the sandy clay layers observed at the site may be acting as an effective barrier to significant vertical migration of inorganics.

4.3.3 Summary of Groundwater Analytical Results

VOC – A dissolved CVOC plume was delineated at Site 3. Concentrations of vinyl chloride, cis-1,2-DCE, trans-1,2-DCE, and TCE in groundwater exceeded the Tier 1 TRGs. The plume appears to have an area of approximately 90,000 square feet. Comparison of analytical data from shallow and deep well pairs indicate that the CVOC plume is limited to the uppermost sand zone of the shallow surficial aquifer, to a depth of approximately 24 feet bls, and has not migrated vertically. Data suggests that the phenomena known as DCE stall has occurred in the dissolved CVOC plume at Site 3. DCE stall in groundwater systems results when insufficient electron acceptors or substrates or adverse environmental conditions prevent further biologically mediated reductive dechlorination of VOCs.

SVOCs – Detected SVOC concentrations were less than the screening criteria.

Pesticides and PCBs – Pesticide and PCB concentrations in the groundwater samples submitted for laboratory analysis were less than standard laboratory detection limits.

Herbicides – Herbicide concentrations in the groundwater samples were less than standard laboratory detection limits.

Metals – An arsenic plume was detected in nine wells in the southern part of the site. Elevated arsenic concentrations occur upgradient of the landfill and do not appear to be related to waste disposal activities. Elevated iron concentrations were also observed in the majority of the wells with elevated arsenic concentrations. Aluminum, lead, and vanadium exceedances occurred in one monitoring well located adjacent to North Pond, upgradient of the landfill. Thallium was detected in one groundwater sample from a deep well, the only screening criteria exceedance reported from a deep well.

4.3.3 Presumptive Remedy Strategy Analysis

- The types of wastes observed in the landfill were predominantly household type wastes, confirming the reports of 16,000 tons of “household type garbage, construction debris, paper, and plastic” in the IAS.
- The refuse, garbage, and debris were the predominant constituents of the landfill with low proportions of solvents and fuels.
- The presence of the CVOC plume beyond the boundary of the waste disposal area will require additional direct treatment in addition to the presumptive remedy containment strategy for the remainder of the landfill.

- The interaction between the layers of silt and sandy clay and the contaminants at the site appear to have created a vertical barrier to migration. While not a true aquaclude, these lower permeable layers restrict movement of the contaminants such that the containment strategy of a soil cover should be effective in reducing future migration of contaminants and will be retained to be evaluated in the FS.

4.4 SURFACE WATER AND SEDIMENT

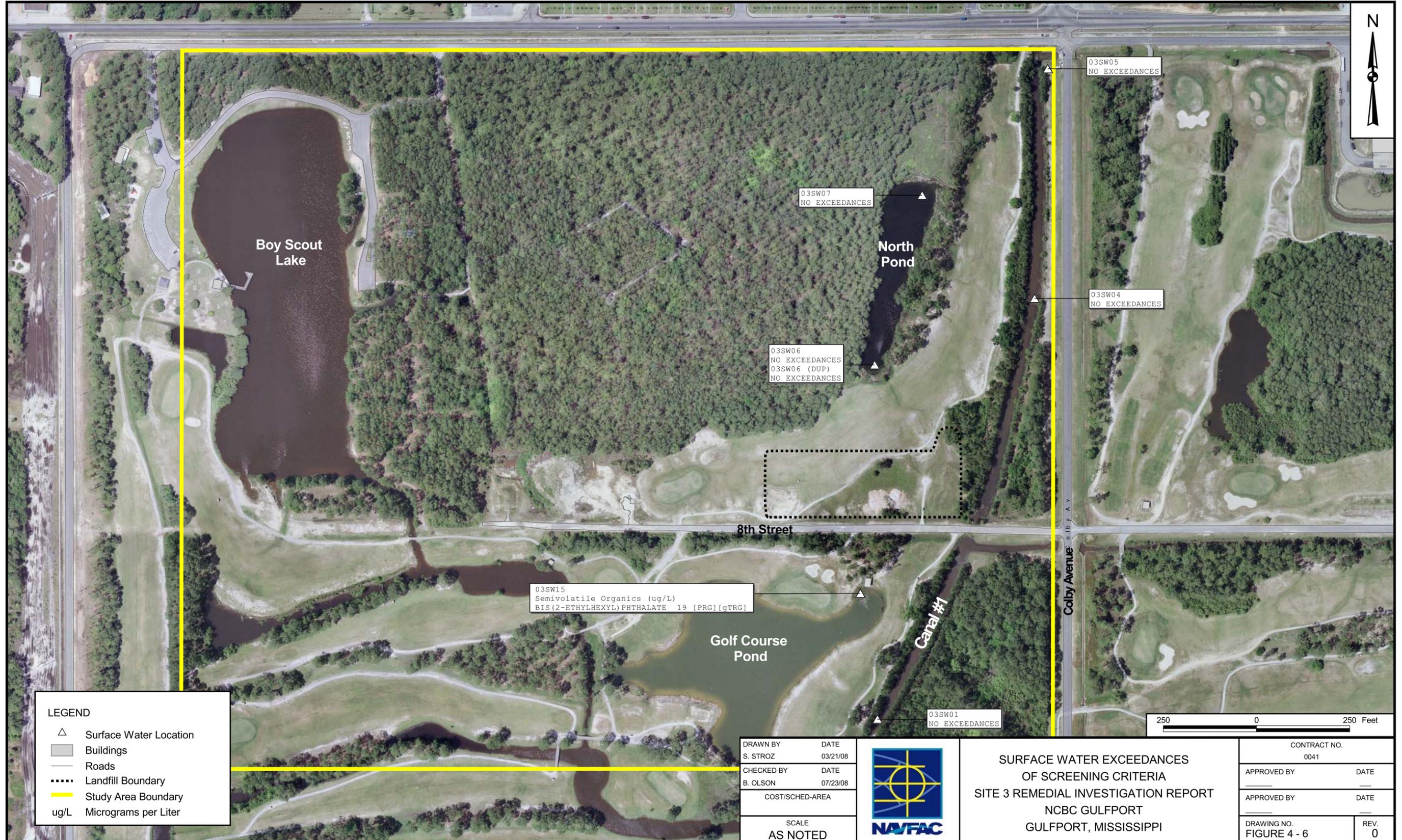
The presumptive remedy strategy for Site 3 includes the removal of the existing sediment to provide a suitable base for the lining of Canal No. 1 with a concrete/rip-rap cover. Removing sediment and lining Canal No. 1 eliminates the transport pathway of groundwater discharge into surface water and sediment.

Because the sediment will be removed from Canal No. 1, the surface water and sediment analytical data will help to determine if the site dynamics support the overall containment strategy. In addition, the sediment data will be important when evaluating the best disposal options for the sediment during the FS.

Eight co-located surface water samples and sediment samples were collected from in the vicinity of the former landfill, five from Canal No. 1 (03SD01 through 03SD05), two from the North Pond (03SD06 and 03SD07), and one from the Golf Course Pond (03SD15) (see Figure 4-6). Two sediment samples, 03SD08 and 03SD09, were collected from drainage features in the wooded area approximately 800 feet to the northwest of the disposal area. Surface water was not present at these locations at the time of sample collection.

Additional surface water and sediments were collected in the northwest corner of the base in support of the evaluation of housing options. Surface water and sediment samples 03SD10 through 03SD14 were collected from the Boy Scout Lake basin. 03SD16 was collected from a pond on the golf course to the southwest of the Golf Course Pond.

The surface water and sediment samples were analyzed for a full suite of analytes including TCL VOCs, TCL SVOCs, pesticides and PCBs, chlorinated herbicides, TAL metals and cyanide. Surface water analytical results are compared to the ESVs and the TRGs for groundwater and the sediment analytical results are compared to the ESVs and the TRGs for soil.



4.4.1 Surface Water

Surface water samples were collected from Canal No. 1 from locations upstream of the waste disposal area (03SW01 and 03SW02) and downstream locations (03SW03, 03SW04, and 03SW05). Golf Course Pond and North Pond are upgradient of the groundwater flow in the waste disposal area. North Pond may receive some surface water runoff from the northern side of the disposal area. Analyte concentrations in surface water samples from North Pond were less than screening criteria.

4.4.1.1 Volatile Organics

Acetone was detected in surface water sample 03SW1501 collected from the Golf Course Pond at a concentration of 4 J µg/L, which is less than the Tier 1 groundwater TRG of 60.8 µg/L and the PRG of 550 µg/L (see Table 4-6). An ESV for acetone is not established. Concentrations of other VOCs in the surface water samples were less than standard laboratory detection limits.

4.4.1.2 Semivolatile Organics

Bis(2-ethylhexyl)phthalate was detected in surface water sample 03SW1501 collected from the Golf Course Pond at a concentration of 19 µg/L, which is greater than the Tier 1 groundwater TRG of 4.8 µg/L and the ESV of 0.3 µg/L (see Table 4-6). Concentrations of other SVOCs in the surface water samples were less than standard laboratory detection limits.

4.4.1.3 Pesticides/PCBs

The pesticide and PCB concentrations reported for the surface water samples submitted for laboratory analysis were less than standard laboratory detection limits.

4.4.1.4 Herbicides

Herbicide concentrations in the surface water samples submitted for laboratory analysis were less than standard laboratory detection limits.

TABLE 4-6
SURFACE WATER - SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Water Body	USEPA Region IX PRG	MDEQ Tier 1 TRG	USEPA Region IV ESV	Canal No. 1 (S) 03SD01 03SW0101 0 - 1 10/12/06	Canal No. 1 03SD02 03SW0201 0 - 1 10/12/06	Canal No. 1 03SD03 03SW0301 0 - 1 10/12/06	Canal No. 1 03SD04 03SW0401 0 - 1 10/12/06	Canal No. 1 (N) 03SD05 03SW0501 0 - 1 10/12/06
Volatile Organics (µg/L)								
ACETONE	5500	608	NA	5 U	5 U	5 U	5 U	5 U
Semivolatile Organics (µg/L)								
BIS(2-ETHYLHEXYL)PHTHALATE	4.8	6	0.3	10 U	10 U	10 U	10 U	10 U
Inorganics (µg/L)								
ALUMINUM	36000	36500	87	87.8 U	67.3 U	389 U	54.2 U	37.8 U
BARIUM	7300	2000	NA	31.5	30.5	38	35.9	34.1
CALCIUM	NA	NA	NA	20600	21400	18100	20700	22000
COPPER	1500	1300	6.54	3.19 U	3.19 U	13	3.19 U	3.19 U
IRON	26000	11000	1000	2860	2850	2940	3580	3680
LEAD	NA	15	1.32	1.8 U	1.8 U	1.9	1.8 U	1.8 U
MAGNESIUM	NA	NA	NA	2740	2800	2810	4150	3990
MANGANESE	880	730	NA	73.3	42	98.2	45.5	42.7
POTASSIUM	NA	NA	NA	2450 U	1570 U	1850 U	2380 U	1900 U
SELENIUM	180	50	5	4.04 U	4.04 U	4.04 U	4.04 U	4.04 U
SODIUM	NA	NA	NA	13900	13700	15100	13600	13400
ZINC	11000	11000	58.91	5.8	3.22 U	13.4	5.7	3.4

Water Body	USEPA Region IX PRG	MDEQ Tier 1 TRG	USEPA Region IV ESV	North Pond 03SD06		North Pond 03SD07	Golf Course Pond 03SD15
Sample Location				03SW0601	03SW0601D	03SW0701	03SW1501
Sample ID				0 - 1	0 - 1	0 - 1	0 - 1
Sample Depth				10/13/06	10/13/06	10/13/06	10/15/06
Sample Date							
Volatile Organics (µg/L)							
ACETONE	5500	608	NA	5 U	5 U	5 U	4 J
Semivolatile Organics (µg/L)							
BIS(2-ETHYLHEXYL)PHTHALATE	4.8	6	0.3	10 U	10 U	10 U	19
Inorganics (µg/L)							
ALUMINUM	36000	36500	87	398 U	57.0 U	21.2 U	427
BARIUM	7300	2000	NA	4.2	3.7	1.9	53.3
CALCIUM	NA	NA	NA	2760	2730	2680	11900
COPPER	1500	1300	6.54	3.19 U	3.19 U	3.19 U	15.5
IRON	26000	11000	1000	316	135	131 U	2780
LEAD	NA	15	1.32	1.8 U	1.8 U	1.8 U	1.9
MAGNESIUM	NA	NA	NA	1760	1760	1720	3430
MANGANESE	880	730	NA	9	8	8.9	63.6
POTASSIUM	NA	NA	NA	5590	6010	5520	3880 U
SELENIUM	180	50	5	4.04 U	4.7	4.04 U	4.04 U
SODIUM	NA	NA	NA	21600	21500	21000	18400
ZINC	11000	11000	58.91	7	4.3	4.1	6.8

NOTES:

MDEQ = Mississippi Department of Environmental Quality
TRG = Target Remediation Goal
USEPA = United States Environmental Protection Agency
Values in bold are positive detections
Bold and shaded values exceed one or more screening criteria

PRG = Preliminary Remediation Goal
ESV = Ecological Screening Value
µg/L = Micrograms per liter
U = Concentration less than value shown
J = Estimated concentration

NA = No criteria available

4.4.1.5 Inorganics

Iron was detected at concentrations exceeding screening criteria in all of the surface water samples from Canal No. 1 (03SW0101 through 03SW0501) and the sample collected from the Golf Course Pond (03SW1501). Iron concentrations in these samples were greater than the ESV of 1,000 µg/L (see Table 4-6), less than the TRG of 11,000 µg/L and the PRG of 26,000 µg/L:

03SW0101	2,860 µg/L
03SW0201	2,850 µg/L
03SW0301	2,940 µg/L
03SW0401	3,580 µg/L
03SW0501	3,680 µg/L
03SW1501	2,780 µg/L

The iron concentrations in the samples collected from Canal No. 1 show an increase of roughly 800 µg/L, moving from the most upstream sample (03SW0101) to the most downstream sample, 03SW0501.

Lead was detected in surface water sample 03SW1501, collected from the Golf Course Pond, and 03SW0301, collected from Canal No. 1 adjacent to the landfill area, at a concentration of 1.9 µg/L, which is greater than the ESV of 1.32 µg/L (see Table 4-6).

Copper was detected in surface water sample 03SW1501, collected from the Golf Course Pond, at a concentration of 15.5 µg/L and 03SW0301, collected from Canal No. 1 adjacent to the landfill area, at a concentration of 13 µg/L, which is greater than the ESV of 6.54 µg/L (see Table 4-6).

Aluminum was detected in surface water sample 03SW1501, collected from the Golf Course Pond, at a concentration of 427 µg/L, which is greater than the ESV of 87 µg/L (see Table 4-6).

Barium, calcium, magnesium, manganese, and sodium were detected in all of the surface water samples (see Table 4-6) at concentrations less than the screening criteria (TRGs are not established for calcium, magnesium, potassium, or sodium). Zinc was detected in all but one of the surface water samples (see Table 4-6) at concentrations less than the screening criteria.

4.4.1.6 Summary of Surface Water Analytical Results

VOCs – Detected VOC concentrations in the surface water samples were less than the screening criteria.

SVOCs – Bis(2-ethylhexyl)phthalate was detected in the surface water sample from Golf Course Pond at a concentration greater than the screening criteria. Concentrations of other SVOCs in the surface water samples were less than standard laboratory detection limits.

Pesticides and PCBs – Concentrations of pesticides and PCBs in the surface water samples were less than standard laboratory detection limits.

Herbicides – Herbicide concentrations in the surface water samples were less than standard laboratory detection limits. The primary HO ingredients (the herbicides 2,4-D and 2,4,5-T) were not detected in any of the samples.

Inorganics – Iron, lead, copper, and aluminum were detected in one or more surface water samples at concentrations greater than the ESVs, but less than human health criteria.

Analytical results for the surface water samples collected from water bodies not directly associated with Site 3 in the northwest corner of the base indicated the presence of the same contaminants detected at Site 3 (see Table 4-7). Bis(2-ethylhexyl)phthalate was detected in one sample from Boy Scout Lake. Aluminum, copper, iron, and lead were detected in one or more of these surface water samples at concentrations similar to those found in the surface water samples collected at Site 3. These results suggest that the contaminant levels reported in Site 3 surface water samples reflect base-wide surface water conditions and do not result from releases from the landfill at Site 3.

4.4.2 Sediment

Sediment samples were collected from locations in Canal No. 1 upgradient and downgradient of the landfill at Site 3 (see Figure 4-7). Sediment samples were also collected from Golf Course Pond and North Pond, which are upgradient of the waste disposal area. North Pond receives some surface water runoff from the north side of the disposal area. Samples were also collected from the wooded area to the northwest of the disposal area.

4.4.2.1 Volatile Organics

Acetone and carbon disulfide were detected in the sediment samples from Site 3 (see Table 4-8). Acetone was reported in all but one of the sediment samples (03SD0401 collected from Canal No. 1). Carbon disulfide was reported only in 03SD0401. The reported concentrations of these VOCs in Site 3 sediments were substantially less than the human health screening criteria. USEPA Region IV has not established sediment ESVs for the VOCs that were detected at Site 3.

TABLE 4-7
SURFACE WATER (SIMILAR LOCAL CONDITIONS) - SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Sample Location	USEPA Region IX	MDEQ Tier 1	USEPA Region IV	03SD10 03SW1001	03SD11 03SW1101	03SD12 03SW1201	03SD13 03SW1301	03SD14 03SW1401	03SD16 03SW1601
Sample ID	PRG	TRG	ESV	10/13/06	10/17/06	10/17/06	10/15/06	10/15/06	10/15/06
Volatile Organics (µg/L)									
ACETONE	5500	608	NA	5	8	8	5 U	5 U	5 U
METHYL ACETATE			NA	5 U	0.9 J	0.9 J	5 U	5 U	5 U
Semivolatile Organics (µg/L)									
BIS(2-ETHYLHEXYL)PHTHALATE	4.8	6	0.3	10 U	11	11 U	10 U	10 U	10 U
Inorganics (µg/L)									
ALUMINUM	36000	36500	87	98.3 U	251 U	442	111 U	122 U	269 U
BARIUM	7300	2000	NA	34.1	27.9	27.4	51.9	25.4	20.5
CALCIUM	NA	NA	NA	9740	10700	10400	12600	12500	10700
COPPER	1500	1300	6.54	14.4	19.1	15.6	16.6	20.7	12.6
IRON	26000	11000	1000	2180	696	727	1610	861	1080
LEAD	NA	15	1.32	2.2	1.9	2.8	3.4	1.8 U	1.8 U
MAGNESIUM	NA	NA	NA	2560	2790	2700	3000	3000	2300
MANGANESE	880	730	NA	71	54.5	50.7	130	58.8	58.4
POTASSIUM	NA	NA	NA	1390 U	2530 U	2660 U	3120 U	4390 U	5090
SODIUM	NA	NA	NA	16700	21200	20600	23500	20200	11600
ZINC	11000	11000	58.91	8.8	6.5	6.1	9.6	7.8	5.8

NOTES:

MDEQ = Mississippi Department of Environmental Quality
 USEPA = United States Environmental Protection Agency
 NA = No criteria available
 µg/L = Micrograms per liter
 U = Concentration less than value shown
 PRG = Preliminary Remediation Goal
 TRG = Target Remediation Goal
 ESV = Ecological Screening Value
 Values in bold are positive detections
 Bold and shaded values exceed one or more screening criteria

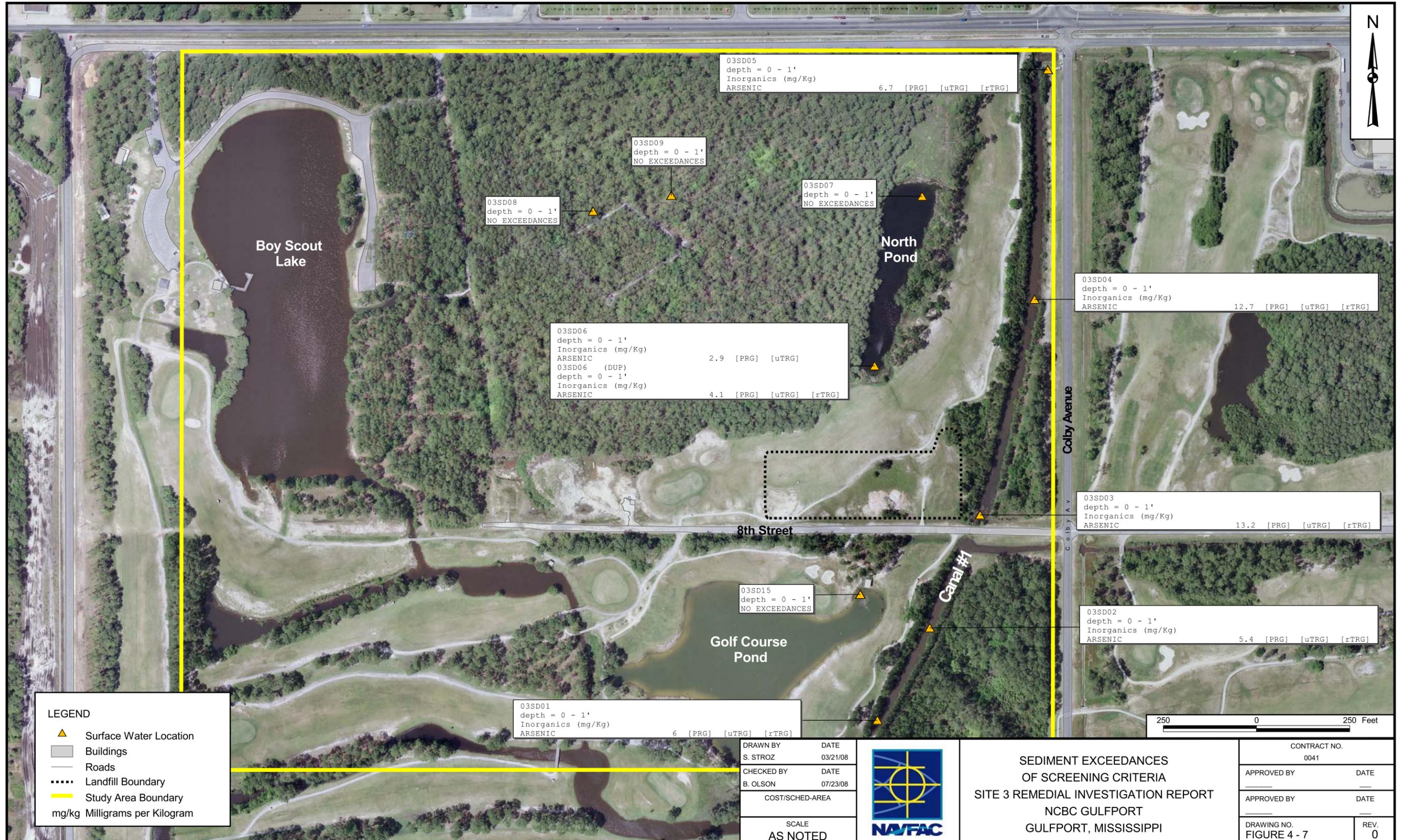


TABLE 4-8
SEDIMENT - SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
PAGE 1 OF 2

Sample Location	USEPA Region 9 PRG Residential	MDEQ TRGs Unrestricted	MDEQ TRGs Restricted	USEPA Region 4 ESV	03SD01 03SD0101 0 - 1 10/12/06	03SD02 03SD0201 0 - 1 10/12/06	03SD03 03SD0301 0 - 1 10/12/06	03SD04 03SD0401 0 - 1 10/12/06	03SD05 03SD0501 0 - 1 10/12/06
Volatile Organics (µg/kg)									
ACETONE	14000000	7820000	104000000	NA	57 J	40 J	18 J	75 U	81 J
CARBON DISULFIDE	360000	7970	7970	NA	8 U	8 U	6 U	7 J	10 U
Pesticides/PCBs (µg/kg)									
4,4'-DDD	2400	2660	23800	3.3	5 U	3.1 J	1.7 J	5.6 U	4.7 U
4,4'-DDE	1700	1880	16800	3.3	3.7	1.6 J	4.2 U	2.9 J	4.7 U
4,4'-DDT	1700	1880	16800	3.3	9.8	4.4	4.2 U	4.4	4.7 U
TOTAL DDD/DDE/DDT				3.3	13.5	9.1	1.7	7.3	4.7 U
ALPHA-BHC	90	101	908	NA	2.6 U	2.6 U	2.2 U	2.9 U	2.4 U
DELTA-BHC	90	101	908	NA	2.6 U	2.6 U	2.2 U	2.9 U	2.4 U
GAMMA-BHC (LINDANE)	440	491	4400	3.3	2.6 U	2 J	2.2 U	2.9 U	2.4 U
ALPHA-CHLORDANE			12300	1.7	2.6 U	2.6 U	2.2 U	2.2 J	2.4 U
GAMMA-CHLORDANE			12300	1.7	2.6 U	2.6 U	2.2 U	2 J	2.4 U
TOTAL CHLORDANE	1600	1820		NA	2.6 U	2.6 U	2.2 U	4.2 J	2.4 U
AROCLOR-1254	220	1000	10000	NA	86	26 U	22 U	49	35
AROCLOR-1260	220	1000	10000	NA	130	56	22 U	42	32
TOTAL AROCLOR				33	216	56	22 U	91	67 [S]
DIELDRIN	30	39.9	358	3.3	5 U	2.8 J	4.2 U	2.6 J	4.7 U
ENDRIN KETONE	18000	23500	61300	3.3	3.2 J	5.1 U	4.2 U	5.6 U	4.7 U
Inorganics (mg/kg)									
ALUMINUM	75000	78200	2040000	NA	14200	14000	2320	15600	8480
ARSENIC	0.39	0.426	3.82	7.24	6	5.4	13.2	12.7	6.7
BARIUM	15000	5480	14300	NA	38.3	36.4	5.6	22.9	22
CALCIUM	NA	NA	NA	NA	822	298	762	892	351
CHROMIUM	30	227	381	52.3	14.9	14.9	4.6	17.1	9.2
COBALT	1400	4690	12300	NA	2	1.4	0.53 U	1.9	1.5
COPPER	3100	3130	8170	18.7	7.5	7.9	3.6	9.3	5
IRON	55000	23500	613000	NA	10900	5800	2890	12000	7680
LEAD	400	400	1700	30.2	18	14.9	10	22	12.1
MAGNESIUM	NA	NA	NA	NA	537	454	389	568	272
MANGANESE	1800	1560	4080	NA	33.4	14.2	6.1	16.4	16.3
MERCURY	23	10	61.3	0.13	0.05	0.04	0.01	0.07	0.03
NICKEL	1600	1560	4080	15.9	5.8	5.8	3	6.2	3.8
SODIUM	NA	NA	NA	NA	39	10.4 U	11.4 U	8.3 U	12.6 U
VANADIUM	78	548	1430	NA	21.3	22.1	5.8	25.4	14
ZINC	23000	23500	61300	124	44.3	37.9	13.7	57.5	31.8

TABLE 4-8
SEDIMENT - SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
PAGE 2 OF 2

Sample Location	USEPA Region 9 PRG Residential	MDEQ TRGs Unrestricted	MDEQ TRGs Restricted	USEPA Region 4 ESV	03SD06 03SD0601 0 - 1 10/13/06	03SD06 03SD0601D 0 - 1 10/13/06	03SD07 03SD0701 0 - 1 10/13/06	03SD08 03SD0801 0 - 1 10/16/06	03SD09 03SD0901 0 - 1 10/16/06	03SD15 03SD1501 0 - 1 10/16/06
Volatile Organics (µg/kg)										
ACETONE	1400000	7820000	104000000	NA	32 J	43 J	22 J	160 J	110 J	23 J
CARBON DISULFIDE	360000	7970	7970	NA	6 U	7 U	5 U	6 U	5 U	6 U
Pesticides/PCBs (µg/kg)										
4,4'-DDD	2400	2660	23800	3.3	4.2 U	1.9 J	4 U	3.8 U	4 U	4.2 U
4,4'-DDE	1700	1880	16800	3.3	1.4 J	1.4 J	4 U	3.8 U	4 U	4.2 U
4,4'-DDT	1700	1880	16800	3.3	4.2 U	4.6 U	4 U	3.8 U	4 U	4.2 U
TOTAL DDD/DDE/DDT				3.3	1.4	3.3	4 U	3.8 U	4 U	4.2 U
ALPHA-BHC	90	101	908	NA	1.9 J	2.1 J	2 U	2 U	2 U	1.8 J
DELTA-BHC	90	101	908	NA	2.2 U	2.4 U	2 U	2 U	2 J	2.2 U
GAMMA-BHC (LINDANE)	440	491	4400	3.3	2.2 U	2.4 U	2 U	2 U	2 U	2.2 U
ALPHA-CHLORDANE			12300	1.7	2.4	3.3	2 U	2 U	2 U	2.2 U
GAMMA-CHLORDANE			12300	1.7	1.5 J	2.1 J	2 U	2 U	2 U	2.2 U
TOTAL CHLORDANE	1600	1820		NA	3.9 J	5.4 J	2 U	2 U	2 U	2.2 U
AROCLOR-1254	220	1000	10000	NA	22 U	24 U	20 U	20 U	20 U	22 U
AROCLOR-1260	220	1000	10000	NA	22 U	24 U	20 U	20 U	20 U	22 U
TOTAL AROCLOR				33	22 U	24 U	20 U	20 U	20 U	22 U
DIELDRIN	30	39.9	358	3.3	4.2 U	1.9 J	4 U	3.8 U	4 U	4.2 U
ENDRIN KETONE	18000	23500	61300	3.3	4.2 U	4.6 U	4 U	3.8 U	4 U	4.2 U
Inorganics (mg/kg)										
ALUMINUM	75000	78200	2040000	NA	7840	10300	5040	2270	3650	713
ARSENIC	0.39	0.426	3.82	7.24	2.9	4.1	0.98 U	0.47 U	1.4 U	0.28 U
BARIUM	15000	5480	14300	NA	13.8	22	7.3	2.5	4.4	1.7
CALCIUM	NA	NA	NA	NA	350	526	98.6	18.8 U	23.9 U	74.4
CHROMIUM	30	227	381	52.3	8.5	10.3	4.7	3.2	4	1.4
COBALT	1400	4690	12300	NA	0.84	0.95 U	0.37 U	0.11 U	0.19 U	0.14 U
COPPER	3100	3130	8170	18.7	4.5	6.4	1.2 U	2.3	1.9 U	0.9 U
IRON	55000	23500	613000	NA	5000	6320	2750	1170	1300	579
LEAD	400	400	1700	30.2	9.9	13.2	2.6	3.3	5	0.71 U
MAGNESIUM	NA	NA	NA	NA	295	354	188	74.4	118	33.2
MANGANESE	1800	1560	4080	NA	9.3	11.7	4	2.7	3.6	1.7
MERCURY	23	10	61.3	0.13	0.02	0.02	0.01 U	0.01 U	0.01 U	0.01 U
NICKEL	1600	1560	4080	15.9	3.3	3.9	1.7 U	1.5 U	1.4 U	0.87 U
SODIUM	NA	NA	NA	NA	37.4	37.4	23.2 U	20.7 U	18.0 U	4.8 U
VANADIUM	78	548	1430	NA	12	15.4	8.4	4	6.1	1.3
ZINC	23000	23500	61300	124	18.6	23.4	3.3	2.6	2.8	1.3

NOTES:

USEPA = United States Environmental Protection Agency
MDEQ = Mississippi Department of Environmental Quality
TRG = Target Remediation Goal
PRG = Preliminary Remediation Goal
ESV = Ecological Screening Value
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
U = Concentration less than value shown
J = Estimated concentration
Values in bold are positive detections
Bold and shaded values exceed one or more screening criteria
NA = No criteria available

4.4.2.2 Semivolatile Organics

Concentrations of SVOCs in sediment samples from Site 3 were less than the laboratory detection limits. Note that the detection limits were elevated due to matrix interference.

4.4.2.3 Pesticides/PCBs

Several pesticides and PCBs (Aroclor-1254 and 1260), were detected in the sediment samples collected at Site 3 (see Table 4-8). The reported concentrations of DDE, DDT, total DDD/DDE/DDT, alpha chlordane, gamma chlordane, and total Aroclors were less than the human health screening criteria; however, concentrations of each of these analytes did exceed ESVs in one or more of the sediment samples. The highest concentrations of DDE, DDT and PCBs were reported from 03SD0101, which was the furthest upstream sample collected from Canal No. 1. The highest chlordane concentrations were reported from 03SD0601, which was collected from the southern end of the North Pond. The risk posed to ecological receptors by pesticides and PCBs in Site 3 sediment are discussed more fully in Section 7.0.

4.4.2.4 Herbicides

Herbicide concentrations in the sediment samples submitted for laboratory analysis were less than standard laboratory detection limits.

4.4.2.5 Inorganics

Metals were frequently detected in the Site 3 sediment samples (see Table 4-8). Arsenic was detected in two of the sediment samples at concentrations greater than the ESV of 7.24 mg/kg:

03SD0301	13.2 mg/kg
03SD0401	12.7 mg/kg

These sample locations were located adjacent to (03SD0301) and downstream of (03SD0401) of the area north of 8th Street where surface water run-off from the disposal area enters Canal No. 1. Arsenic was detected at the three other sediment samples collected from Canal No. 1 at concentrations greater than the restricted TRG of 3.82 mg/kg:

03SD0101	6 mg/kg (furthest upstream)
03SD0201	5.4 mg/kg (upstream of waste disposal area)
03SD0501	6.7 mg/kg (furthest downstream)

The arsenic concentration in the field duplicate of 03SD0601, 4.1 mg/kg, also exceeded the unrestricted TRG. The reported arsenic concentration for sample 03SD0601 was 2.9 mg/kg, which is less than the restricted TRG. This sample pair was collected at the southern end of the North Pond, which receives surface water run-off from the golf course north of the center line of the fairway.

Other metals were detected in most of the sediment samples at concentrations less than the screening criteria (screening criteria are not established for calcium, magnesium, or sodium). The risk posed to ecological receptors by metals in Site 4 sediment are discussed more fully in Section 7.0.

4.4.2.6 Summary of Sediment Analytical Results

VOCs – Detected VOC concentrations in the sediment samples were less than the screening criteria.

SVOCs – Concentrations of SVOCs in sediment samples from Site 3 were less than the laboratory detection limits. Note that the detection limits were elevated due to matrix interference.

Pesticides and PCBs – The reported concentrations of DDE, DDT, total DDD/DDE/DDT, alpha chlordane, gamma chlordane, and total Aroclors were less than the human health screening criteria; however, concentrations of each of these analytes did exceed ESVs in one or more of the sediment samples. The highest concentrations of DDE, DDT, and PCBs were reported from the furthest upstream sample collected from Canal No. 1.

Herbicides – Herbicide concentrations in the sediment samples were less than standard laboratory detection limits. The primary HO ingredients (the herbicides 2,4-D and 2,4,5-T) were not detected in any of the samples.

Inorganics – Arsenic was detected in sediment samples collected from Canal No. 1 and one sample from North Pond and was the only metal detected in sediment samples collected at Site 3 with concentrations exceeding screening criteria. The reported arsenic concentrations were within concentration ranges typical for Mississippi Coastal Plain soil.

Analytical results for the sediment samples collected from water bodies not directly associated with Site 3 in the northwest corner of the base indicated the presence of contaminants similar to those detected at Site 3 (see Table 4-9). Arsenic was detected in these sediment samples at concentrations similar to those found at Site 3. These results suggest that the contaminant levels reported in Site 3 sediment samples reflect base-wide surface water conditions and do not result from releases from the landfill at Site 3.

TABLE 4-9
SEDIMENT (OFF SITE) - SUMMARY OF POSITIVE DETECTIONS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Sample Location	USEPA Region IX	MDEQ Tier 1 Unrest	MDEQ Tier 1 Rest	USEPA Region IV	03SD10 03SD1001	03SD11 03SD1101	03SD12 03SD1201	03SD13 03SD1301	03SD14 03SD1401	03SD16 03SD1601
Sample ID					0 - 1	0 - 1	0 - 1	0 - 1	0 - 1	0 - 1
Sample Depth										
Sample Date	PRG	TRG	TRG	ESV	10/13/06	10/17/06	10/17/06	10/15/06	10/15/06	10/15/06
Volatile Organics (µg/kg)										
ACETONE	14000000	7820000	104000000	NA	290 J	21 J	26 U	26 J	25 J	54 J
CARBON DISULFIDE	360000	7970	7970	NA	3 J	5 U	5 U	7 U	6 U	7 U
Pesticides/PCBs (µg/kg)										
ALPHA-BHC	90	101	908	NA	3.1 U	2 U	2 U	2.3 U	1.5 J	1.9 J
DELTA-BHC	90	101	908	NA	2.4 J	2 U	2 U	2.3 U	2.1 U	2.2 U
ENDRIN KETONE	18000	23500	61300	NA	2.8 J	4 U	4 U	4.4 U	4.2 U	4.3 U
GAMMA-BHC (LINDANE)	440	491	4400	3.3	2.3 J	2 U	2 U	2.3 U	2.1 U	2.2 U
Inorganics (mg/kg)										
ALUMINUM	75000	78200	2040000	NA	9090	1640	5280	2380	2570	6130
ARSENIC	0.39	0.426	3.82	7.24	3.7	1.6 U	1.0 U	1.4 U	0.65 U	4.6
BARIUM	15000	5480	14300	NA	30.2	3.4	8.4	4.2	5.8	10.5
CALCIUM	NA	NA	NA	NA	628	165	367	215	112	562
CHROMIUM	30	227	381	52.3	10	2.9	5.4	3	2.7	7
COBALT	1400	4690	12300	NA	1.3	0.17 U	0.29 U	0.19 U	0.18 U	0.55 U
COPPER	3100	3130	8170	18.7	4.1	1.2 U	1.5 U	1.5 U	1.2 U	1.9 U
IRON	55000	23500	613000	NA	7000	1900	3680	1710	1010	10200
LEAD	400	400	1700	30.2	11.8	2	4.1	1.9	12.8	3.3
MAGNESIUM	NA	NA	NA	NA	377	76.3	241	92.1	102	215
MANGANESE	1800	1560	4080	NA	11.8	2.9	8.3	3	3.3	11
MERCURY	23	10	61.3	0.13	0.02	0.01 U				
NICKEL	1600	1560	4080	15.9	4.2	1.2 U	2.0 U	1.5 U	1.3 U	2.2 U
VANADIUM	78	548	1430	NA	13.6	5.2	7.3	3.8	2.9	13.8
ZINC	23000	23500	61300	124	33	1.8	4.2	6.1	2.2	6.4

NOTES:

MDEQ = Mississippi Department of Environmental Quality
 USEPA = United States Environmental Protection Agency
 TRG = Target Remediation Goal
 PRG = Preliminary Remediation Goal
 ESV = Ecological Screening Value
 µg/kg = micrograms per kilogram
 mg/kg = milligrams per kilogram
 U = Concentration less than value shown
 J = Estimated concentration
 Values in bold are positive detections
 Bold and shaded values exceed one or more screening criteria
 NA = No criteria available

4.4.3 Surface Water and Sediment Results and Presumptive Remedy

The following is a summary of the surface water and sediment investigation in relation to the application of the presumptive remedy at Site 3:

- One additional consideration is the nature of the muck currently lining Canal No. 1. This highly organic material is very effective at binding and trapping organic compounds such as pesticides, SVOCs, and dioxins. Removal of this muck will effectively remove these contaminants.
- The evaluation of the sediment showed an average thickness of approximately 2.5 feet of muck above a firmer silty, fine sand bottom.
- The results of the surface water and sediment sampling support the overall presumptive remedial strategy of containment and the specific response action objectives of removing sediment/cover for Canal No. 1 and minimizing runoff at Site 3.

4.5 AIR

Air samples were not collected from Site 3 during the RI because the concentrations of volatile contaminants previously detected in soil and groundwater were relatively low. Air monitoring was conducted during the site investigation to identify potential exposure to higher concentrations of volatile contaminants.

To determine the potential for migration of soil contaminants to the atmosphere, the contaminant concentrations were compared to the USEPA SSLs. SSLs have been established for various volatiles, pesticides/PCBs, and metals. Concentrations of these classes of analytes that were detected in soil at Site 3 were less than the default SSL values.

USEPA groundwater volatilization criteria have been established for many of the VOCs detected in groundwater at Site 3. Benzene, chloromethane, cis-1,2-DCE, TCE, and vinyl chloride were reported in one or more groundwater samples at concentrations greater than the default criteria, indicating the potential for migration and accumulation of vapors from the groundwater.

4.6 NATURE AND EXTENT CONCLUSIONS

As discussed in this chapter, one of the primary objectives of the RI was to evaluate the nature and extent the impact of the waste disposal at Site 3 and to determine if the resulting site conditions meet the requirements to continue to pursue the current presumptive remedy strategy.

The *Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills* (USEPA, 1996c) identifies the waste characteristics of military landfills that allow the application of the Presumptive Remedy guidance. The guidance states that appropriate characteristics include:

- Risks are low-level except for “hot spots.” The results of sampling were generally below screening levels except for the groundwater plume and the sediment in Canal No. 1.
- Treatment of wastes is usually impractical due to the volume and heterogeneity of the waste. The vast majority of the material at Site 3 is non-hazardous debris and household type wastes.
- Waste types include household, commercial, non-hazardous sludge, and industrial waste solids. The IAS reports that 30,000 tons of non-hazardous solids and debris were disposed at the site. This general type of waste was confirmed during drilling activities.
- Lesser quantities of hazardous wastes are present as compared to municipal wastes. The hotspots at the site represent a very small volume of the total waste.
- Land application units, surface impoundments, injection wells, and waste piles are **not** included. There is no reported history, nor any visual evidence, of these at Site 3.

The guidance further states that, it is anticipated that military landfills will have industrial solid waste, paints (and paint thinners), pesticides, transformer oils, and other solvents in relatively low proportion to the volume of municipal wastes – including construction debris, commercial/household type garbage, and yard wastes. The types of waste that would exclude a military site from presumptive remedy consideration include chemical warfare agents, munitions, and other explosives.

Based on the site investigation results, Site 3 has the acceptable characteristics necessary to continue with the presumptive remedy. However, CVOC groundwater contamination will require direct action and the incorporation of additional response action objectives into the overall remedial strategy. The following chapter, *Fate and Transport*, will examine the potential impact to local receptors and support refinement of the response action objectives necessary to address the contaminant pathways.

5.0 CONTAMINANT FATE AND TRANSPORT

The behavior of contaminants released into the environment, particularly the potential for a contaminant to migrate from a release area and persist in an environmental medium, can influence whether the release will result in an adverse human health or ecological effect. The movement of contaminants in the environment will be controlled by certain properties of the contaminant and the availability of suitable pathways for contaminant movement. The fate and transport discussion for this report is limited to the groups of chemicals detected during the Site 3 sampling events at concentrations greater than the screening criteria (as presented in Section 4.0), including TRGs established by the state of Mississippi, USEPA MCLs, SSLs, Region 9 residential PRGs, and Region 4 ESVs.

5.1 POTENTIAL ROUTES OF MIGRATION

The movement of contaminants in the environment will be controlled by the source and nature and extent of the contaminants and the availability of suitable pathways for contaminant movement.

5.1.1 Potential Contaminant Sources

A review of disposal practices and interviews with site workers during the IAS (Envirodyne Engineers, 1985) estimated that approximately 30,000 tons of solid wastes were disposed at the site between 1948 and the mid-1960s. During the time this landfill was operated, nearly all of the solid waste and some of the liquid/chemical waste generated at NCBC Gulfport were disposed at this site. The solid waste, generated by base activities, was placed in trenches and burned on a daily basis prior to backfilling.

At Site 3, the waste disposal boundary was established by evaluating the results of the geophysical survey, which indicate a roughly rectangular landfill area 450 feet east to west and 125 feet north to south. The landfill area as defined by the geophysical survey is approximately 1.5 acres.

The current surface soil cover at Site 3 was emplaced after land filling activities were completed; therefore, surface soil contamination would not be the result of landfill activities unless landfill material was mixed with the soil cover or part of the disposal area was not covered.

A fire-fighting training pit was also located at the site and was reportedly used from the mid-1950s to 1966. An estimated 130,000 gallons of waste fuels, oils, solvents, paints, and paint thinners were burned at the fire-fighting training pit. The groundwater CVOC plume was identified based on soil-gas and groundwater data.

Some of the landfill material and subsurface soil matrix encountered during RI showed indications of burning. These findings are consistent with the reported disposal activities at Site 3 and are consistent with the types of wastes allowed under the municipal landfill presumptive remedy.

5.1.2 Preliminary Site Conceptual Model

The preliminary site conceptual model was developed to evaluate the relationships between the contaminant sources at Site 3, potentially effected media, and contamination migration pathways. Buried waste in the landfill cells was considered the primary source for contaminants at the site. The primary release mechanism is the direct contact of subsurface soil and groundwater with the buried waste, leaching of contaminants to soil and groundwater, and potential migration of liquid wastes disposed at the site.

Surface soil was considered a secondary source of contaminants because it is fill material of unknown origin emplaced after landfill operations ceased, and may also have been affected by normal golf course activities not related to the landfill operation.

5.1.3 Potential Pathways for Contaminant Migration

Based on the evaluation of existing conditions at Site 3, the following potential contaminant transport pathways may exist at the site:

- Leaching of soil contaminants to groundwater
- Surface migration of soil contaminants to surface water or sediment
- Migration of groundwater contaminants and discharge to surface water or sediment
- Volatilization from groundwater and volatilization or particulate migration from surface soil to the atmosphere

5.1.3.1 Leaching of Soil Contaminants to Groundwater

Contaminants that adhere to soil particles or have accumulated in soil pore spaces can be remobilized and transported to groundwater because of infiltration or precipitation. The rate and extent of this leaching are influenced by the following:

- Depth of the water table
- Amount of precipitation
- Rate of infiltration

- Physical and chemical properties of the soil
- Physical and chemical properties of the contaminant

The mobility of chemicals at Site 3 will be influenced by the relatively shallow water table, potentially high rates of precipitation, and sandy soil in the area, which may allow a higher rate of infiltration. The contaminants identified at Site 3 (metals and CVOCs) generally have physical and chemical properties that result in low mobility and persistence in the environment.

5.1.3.2 Surface Migration of Soil Contaminants

Contaminants that adhere to soil particles or have accumulated in soil pore spaces can be remobilized and transported mechanically to surface water bodies and associated sediment. The rate and extent of this surface transport are influenced by the following:

- Amount of precipitation
- Physical and chemical properties of the soil
- Physical and chemical properties of the contaminant
- Proximity to receiving waters

The mobility of chemicals at Site 3 could be influenced by the potentially high rates of precipitation and the sandy soil in the area, which may allow mechanical transport. Transport by surface water flow will be inhibited by the grass cover at the site.

5.1.3.3 Migration of Groundwater Contaminants

Contaminants can migrate in a dissolved phase or as an immiscible liquid. A contaminant that is present in water at concentrations greater than its solubility concentration will form an immiscible liquid. Based on the specific gravity of the contaminant, it will either float or sink in the water. In the case of chlorinated solvents (e.g., TCE), the contaminant will sink in the water because it has a higher specific gravity than water. Subsurface transport of immiscible contaminants is governed by a set of factors different from those of dissolved contaminants.

The groundwater data at Site 3 do not provide evidence of immiscible contaminants at concentrations exceeding water solubility levels. For example, VOCs were detected at concentrations less than their water solubilities. Therefore, the migration of groundwater contaminants, for the most part, is likely governed by factors that govern the movement of dissolved contaminants. Three general processes

govern the migration of dissolved constituents in groundwater: advection, dispersion, and retardation. Advection is a process by which solutes are carried by groundwater movement. Dispersion is a mixing of contaminated and uncontaminated water during advection. Retardation is a slowing of contaminant migration caused by the reaction of the solute with the aquifer soil.

Contaminant concentrations may be affected by one or more mechanisms during transport. Volatilization or precipitation may physically transform contaminants. Contaminants may be chemically transformed through photolysis, hydrolysis, or oxidation/reduction. Contaminants may also be biologically transformed by biodegradation.

Hydrogeologic data were collected to evaluate movement of groundwater in the shallow surficial aquifer at Site 3. These data were used to estimate the site-specific groundwater flow direction and velocity. Groundwater flow in the shallow aquifer is to the east, from the waste disposal area to Canal No. 1. The westernmost edge of the waste disposal area to Canal No. 1 is approximately 600 feet. With a groundwater flow velocity of 0.24 foot per day, it is estimated that groundwater and potential contaminants would migrate from the western edge of the waste disposal area to Canal No. 1 in 6.85 years.

The dissolved contaminants in groundwater may migrate downgradient with the natural flow of groundwater and discharge as seeps to the drainage ditches that run along the eastern side of the site. Contaminants can then migrate in the direction of surface water flow as dissolved constituents in surface water or bound to sediment. Three general processes govern the migration of dissolved contaminants caused by the flow of surface water: movement caused by the flow of surface water, movement caused by the irregular mixing of water, and chemical mechanisms occurring during the movement of surface water. Sediment particles can disassociate from the sediment into surface water and migrate by one of the aforementioned methods.

At Site 3, contaminants in drainage ditches and swales adjacent to 8th Street may be transported east to Canal No. 1. Storm events are of particular concern because of greater flow velocities, which can mobilize bedload sediments that are usually not disturbed under normal flow conditions. Because most of the site has maintained grass, erosion and overland transport of particulate matter from on-site surface soil do not appear to be important transport mechanisms at Site 3.

5.1.3.4 Volatilization from Soil or Groundwater

Chemicals in soil can migrate into ambient air either as vapors or by adhering to particulate matter (dusts). Chemicals that have a significant volatility are likely to enter ambient air as vapors. Once in groundwater, volatile chemicals may migrate or they may volatilize through the capillary zone and overlying soil layers into ambient air or inside buildings.

Chemicals in the vapor phase may migrate horizontally or vertically and can enter buildings through cracks in the foundation or through foundation walls. Once inside buildings, the air concentrations in buildings are subject to various factors such as building dimensions and ventilation rates. Upon entering ambient air, the vapors are not expected to persist for long periods because half-lives of VOCs in the atmosphere are typically measured in hours or a few days. The air concentrations of vapors in ambient air are likely to be quickly diluted by the action of winds. Vapors may also be released directly to ambient air from soil or groundwater during excavation activities.

Many of the contaminants detected in soil and groundwater samples at Site 3 are not especially volatile and are not expected to vaporize into the air. Because most of the site is grass covered, little dust is generated under normal conditions. However, there is a potential for particulate exposure in areas without grass if the soil is heavily disturbed (e.g., during excavation).

5.2 CONTAMINANT PERSISTENCE

The persistence of contaminants after they are released to the environment is controlled by the susceptibility of the contaminants to certain chemical and biological processes that may degrade the contaminants and reduce their remaining mass.

5.2.1 Physical and Chemical Factors Affecting Contaminant Fate

The following properties can be used to evaluate the potential environmental mobility and fate of contaminants:

- Specific gravity
- Vapor pressure
- Water solubility
- Octanol/water partition coefficient (K_{ow})
- Organic carbon partition coefficient (K_{oc})
- Henry's Law constant

- Bioconcentration factor (BCF)
- Mobility index

Table 5-1 presents the physical and chemical properties of the organic compounds detected at Site 3. The relative mobilities of metals as a function of environmental conditions are provided in Table 5-2.

5.2.1.1 Specific Gravity

Specific gravity is the ratio of the weight of a given volume of pure chemical at a specified temperature to the weight of the same volume of water at a given temperature. Specific gravity is used to determine whether a chemical will have a tendency to float or sink in water when present as a pure chemical or at very high concentrations. Non-aqueous-phase chemicals with specific gravities greater than 1 will tend to sink, and chemicals with specific gravities less than 1 will tend to float. The groups of chemicals detected at Site 3, particularly CVOCs, generally have specific gravities greater than 1.

5.2.1.2 Vapor Pressure

Vapor pressure provides an indication of the rate at which a chemical volatilizes from both soil and water. Chemicals with higher vapor pressures are expected to enter the atmosphere much more readily than chemicals with lower vapor pressures. Volatilization is a significant loss process for VOCs in surface water or surface soil and is of primary importance at environmental interfaces such as surface soil/air and surface water/air. Volatilization is not as important when evaluating contaminated groundwater and subsurface soils that are not exposed to the atmosphere. Vapor pressures for halogenated VOCs are typically one or more orders of magnitude higher than vapor pressures for PAHs, and volatilization is not significant for metals other than mercury.

5.2.1.3 Water Solubility

The rate at which a chemical may be leached from a solid matrix (e.g., soil or waste deposit) by infiltrating precipitation is proportional to its water solubility. More soluble chemicals are more readily leached than less soluble chemicals. The water solubilities presented in Table 5-1 indicate that TCE is slightly more soluble than PAHs, which are not especially water-soluble.

TABLE 5-1

ENVIRONMENTAL FATE AND TRANSPORT PARAMETERS FOR ORGANIC CHEMICALS
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Chemical	Specific Gravity (@ 20/4°C)(2)	Vapor Pressure (mm Hg @ 20°C)(2)	Solubility (mg/L @ 20°C)(2)	Octanol/Water Partition Coefficient(2)	Organic Carbon Partition Coefficient(4)	Henry's Law Constant (atm-m ³ /mole)(2)	Bioconcentration Factor (mg/L/mg/kg)(4)	Mobility Index log((solubility*VP)/K _{oc})
KETONES								
Acetone	0.7899	2.66E+2 (25°C)	Miscible	5.75E-01	7.08E+03 (10)	4.276E-5 (25°C)	3.81E-1(6)	NA
2-Butanone	0.8054	1.0E+2 (25°C)	2.75E+05	1.82E+00	4.44E+0(9)	4.66E-5 (25°C)	9.3E-1(6)	6.79E+00
MONOCYCLIC AROMATICS								
Benzene	0.8765	9.50E+01	1.75E+03	1.35E+02	5.89E+01	5.55E-03	3.70E+01	3.45E+00
HALOGENATED ALIPHATICS								
Chloroethane	0.92 (0/4°C)	1.00E+03	5.74E+03	1.54E+00	1.52E+00	8.48E-3 (25°C)	6.7E-01-8.6E-01	6.58E+00
Chloroform	1.4832	1.60E+02	9.3E+3 (25°C)	9.33E+01	3.98E+01 (10)	3.39E-3 (25°C)	2.60E+01	4.57E+00
cis-1,2-Dichloroethene	1.2837	2.02E+2 (25°C)	8.00E+02	1.58E+02	3.55E+01 (10)	4.08E-3 (24.8°C)	1.4E+1(3)	3.66E+00
1,1-Dichloroethane	1.1757	2.34E+2 (25°C)	5.50E+03	1.67E+01	3.13E+01 (10)	5.871E-3 (25°C)	1.90E+01	4.61E+00
1,1-Dichloroethene	1.218	5.91E+2 (25°C)	2.1E+2 (25°C)	3.02E+01	5.89E+01 (10)	2.286E-2 (25°C)	5.30E+01	3.32E+00
MISCELLANEOUS VOLATILE ORGANICS								
Carbon disulfide	1.2632	2.98E+02	2.90E+03	1.45E+04	4.57E+01 (10)	1.921E-2 (25°C)	2.6E+1 (6)	4.28E+00
POLYNUCLEAR AROMATIC HYDROCARBONS (PAHs)								
Acenaphthene	1.07	5.00E-03	4.24E+02	8.32E+03	7.08E+03	1.55E-04	1.10E+03	-3.52E+00
Acenaphthylene	1.02	2.30E-02	1.61E+01	1.17E+04	2.00E+03	1.14E-04	3.80E+02	-3.73E+00
Anthracene	1.283 (25/4°C)	1.95E-4 (25°C)	1.29E+0 (25°C)	2.82E+04	2.95E+04 (10)	8.6E-5 (25°C)	4.70E+03	-8.07E+00
Benzo(a)anthracene	1.274	5.00E-09	1E-2 (24°C)	4.07E+05	3.98E+05 (10)	6.60E-07	5.30E+04	-1.59E+01
Benzo(b)fluoranthene	NA	5.00E-07	1.2E-3 (25°C)	3.72E+06	1.23E+06 (10)	1.20E-05	1.40E+05	-1.53E+01
Benzo(k)fluoranthene	NA	9.59E-11	5.5E-4 (25°C)	6.92E+06	1.23E+06 (10)	1.04E-03	1.40E+05	-1.94E+01
Benzo(g,h,i)perylene	NA	1.00E-10	2.6E-4 (25°C)	1.70E+07	1.60E+06	1.4E-7 (25°C)	3.50E+05	-1.98E+01
Benzo(a)pyrene	1.351	5.00E-09	3.8E-3 (25°C)	9.55E+05	1.02E+06 (10)	4.9E-7 (25°C)	1.40E+05	-1.67E+01
Carbazole	1.1	1.37E-06	7.48E+00	3.89E+03	3.39E+03	1.53E-08	5.01E+02	-8.52E+00
Chrysene	1.274 (20°C)	6.3E-9 (25°C)	6E-3 (25°C)	4.07E+05	3.98E+05 (10)	1.05E-6 (25°C)	5.30E+04	-1.60E+01
Dibenzo(a,h)anthracene	1.282	1.00E-10	5E-4 (25°C)	9.33E+05	3.80E+06 (10)	7.3E-8 (25°C)	6.90E+05	-1.99E+01
Fluoranthene	1.252	5.0E-6 (25°C)	2.65E-1 (25°C)	2.14E+05	1.07E+05 (10)	6.5E-6 (25°C)	1.20E+04	-1.09E+01
Fluorene	1.202	1.00E+01	1.98E+00	1.62E+04	1.38E+04	6.36E-05	3.80E+03	-2.84E+00
Indeno(1,2,3-cd)pyrene	NA	1E-10 (25°C)	6.20E-02	4.57E+07	3.47E+06 (10)	6.95E-8 (25°C)	3.50E+05	-1.77E+01
Phenanthrene	0.980 (4°C)	1E+0 (118.2°C)	8.16E-1 (21°C)	2.88E+04	1.40E+04	3.93E-5 (25°C)	4.70E+03	-4.23E+00
Pyrene	1.271 (23/4°C)	2.5E+0 (200°C)	1.6E-1 (26°C)	1.51E+05	1.05E+05 (10)	5.1E-6 (25°C)	1.20E+04	-5.42E+00
PHTHALATE ESTERS								
Bis(2-ethylhexyl)phtalate	0.99 (20/20°C)	1.2E+0 (200°C)	4E-1 (25°C)	2.00E+05	1.51E+07 (10)	3.00E-07	2.30E+08	-7.50E+00

TABLE 5-1

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Chemical	Specific Gravity (@ 20/4°C)(2)	Vapor Pressure (mm Hg @ 20°C)(2)	Solubility (mg/L @ 20°C)(2)	Octanol/Water Partition Coefficient(2)	Organic Carbon Partition Coefficient(4)	Henry's Law Constant (atm-m ³ /mole)(2)	Bioconcentration Factor (mg/L/mg/kg)(4)	Mobility Index log((solubility*VP)/K _{oc})
PESTICIDES								
Aldrin	1.18	2.31E-05	1.80E-01	3.16E+06	2.45E+06	6.97E-03	1.10E+02	-1.18E+01
alpha-Chlordane (11)	1.61 (25°C)	1E-5 (25°C)	5.60E-02	6.03E+02	1.20E+05	4.79E-05 (25°C)	4.00E+04	-1.13E+01
4,4'-DDD	1.476	1.0E-06 (30°C)	1.6E-1 (24°C)	9.77E+05	1.00E+06 (10)	2.16E-05	1.80E+05	-1.28E+01
4,4'-DDE	NA	6.50E-06	4.00E-02	4.90E+05	4.47E+06 (10)	2.34E-05	8.90E+05	-1.32E+01
4,4'-DDT	1.5 (15/4°C)	1.50E-07	3.1E-3 (25°C)	1.55E+06	2.63E+06 (10)	3.89E-5 (25°C)	8.00E+06	-1.58E+01
Dieldrin	1.75	1.8E-7 (25°C)	1.86E-01	1.23E+04	2.14E+04 (10)	5.84E-5 (25°C)	7.10E+02	-1.18E+01
Endosulfan II	1.745 (20/20°C)	2.40E-5 (25°C)	5.1E-01(3)	1.26E+04(3)	2.04E+03(3)	1.12E-05(3)	2.9E+02(5)	-8.22E+00
Endosulfan sulfate	NA	9.00E-03	1.17E-01	3.66E+00	3.76E+00	4.70E-07	3.56E+02	-3.55E+00
Endrin	1.65 (25°C)	2.0E-7 (25°C)	2.5E-01(3)	1.15E+05(3)	1.08E+04(3)	7.52E-06(3)	1.8E+03(5)	-1.13E+01
Endrin aldehyde	1.65 (25°C)	2.0E-7 (25°C)	2.5E-01(3)	1.15E+05(3)	1.08E+04(3)	7.52E-06(3)	1.8E+03(5)	-1.13E+01
Endrin ketone	NA	NA	NA	NA	NA	NA	NA	NA
gamma-Chlordane (11)	1.61 (25°C)	1E-5 (25°C)	5.60E-02	6.03E+02	1.20E+05	4.79E-05 (25°C)	4.00E+04	-1.13E+01
Heptachlor epoxide	NA	3.00E-04	3.5E-1(15°C)	5.00E+00	8.32E+04	3.90E-04	7.50E+03	-8.90E+00
Methoxychlor	1.41 (25°C)	NA	4.0E-02 (24°C)	4.91E+00	1.07E+05	1.60E-05	8.10E+03	NA
PCBs								
Aroclor-1242	1.392	2.50E-04	2.00E-02	1.29E+04	5.03E+05	5.60E-04	3.6E+03 - 4.3E+04	-1.10E+01
Aroclor-1260	1.58 (25°C)(4)	4.05E-5(4)	2.7E-3(4)	1.4E+7(4)	6.70E+06	7.4E-1(4)	1.30E+06	-1.38E+01

- 1 NA - Not Available
- 2 EPA, September 1992, Handbook of RCRA Groundwater Monitoring Constituents: Chemical and Physical Properties.
- 3 Lyman et al., 1990; Equation 5-3, Handbook of Chemical Property Estimation Methods.
- 4 USEPA, December 1982, Aquatic Fate Process Data for Organic Priority Pollutants.
- 5 ATSDR, October 1989, Toxicity Profile for Xylenes.
- 6 Lyman et al., 1990, Eq. 5-2
- 7 Verschuere, 1983, Handbook of Environmental Data of Organic Chemicals.
- 8 Howard, 1989, Handbook of Environmental Fate and Exposure Data for Organic Chemicals, Volume 1.
- 9 Lyman et al., 1990; Equation 4-5
- 10 EPA, July 1996, Soil Screening Guidance.
- 11 Chlordane data used

TABLE 5-2
RELATIVE MOBILITIES OF METALS AS A FUNCTION OF ENVIRONMENTAL CONDITIONS (Eh,pH)
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Relative Mobility	Environmental Conditions			
	Oxidizing	Acidic	Neutral/ Alkaline	Reducing
Very High			Selenium	
High	Selenium Zinc	Selenium Zinc Copper Nickel Mercury Silver		
Medium	Copper Nickel Mercury Silver Arsenic Cadmium	Arsenic Cadmium	Arsenic Cadmium	
Low	Lead Barium Beryllium	Lead Barium Beryllium	Lead Barium Beryllium	
Very Low	Iron Chromium	Chromium	Chromium Zinc Copper Nickel Mercury Silver	Chromium Selenium Zinc Copper Nickel Mercury Lead Barium Beryllium Silver

The solubility of inorganics is strongly influenced by their valence state(s) and forms (hydroxides, oxides, carbonates, etc.). The solubility is also dependent on pH, redox potential (Eh), temperature, and other ionic species in solution (the Debye-Huckel theory). The solubility products reported in the literature vary with the type of complex formed, but generally, for example, cadmium and copper complexes are more soluble than lead and nickel complexes.

5.2.1.4 Octanol/Water Partition Coefficient

The K_{ow} is a measure of the equilibrium partitioning of chemicals between octanol and water. A linear relationship between the K_{ow} and the uptake of chemicals by fatty tissues of animal and human receptors (the BCF) has been established. K_{ow} values are also useful in characterizing the sorption of compounds by organic soils where experimental values are not available. PAHs are more likely to partition to fatty tissues than the more soluble VOCs. The K_{ow} is also used to estimate BCFs in aquatic organisms.

5.2.1.5 Organic Carbon Partition Coefficient

The K_{oc} indicates the tendency of a chemical to adhere to soil particles containing organic carbon. Chemicals with high K_{oc} values generally have low water solubilities and vice versa. This parameter may be used to infer the relative rates at which more mobile chemicals (ketones, monocyclic aromatics, and halogenated aliphatics) partition to groundwater. Most PAHs are relatively immobile in soil and are preferentially bound to the soil. These compounds are not as likely to be transported in the dissolved phase by groundwater to the same extent as compounds with higher water solubilities. However, these preferentially bound chemicals are easily transported by erosional processes when they are present in surface soil and the soil particles to which they have adsorbed are mobilized.

5.2.1.6 Henry's Law Constant

Vapor pressure and water solubility are used in determining volatilization rates from surface water bodies and from groundwater. The ratio of these two parameters, the Henry's Law constant, is used to calculate the equilibrium chemical concentrations in the vapor (air) phase versus the liquid (water) phase for the dilute solutions commonly encountered in environmental settings. In general, chemicals having a Henry's Law constant of less than $1 \times 10^{-5} \text{ atm}\cdot\text{m}^3$ per mole should volatilize very little and be present only in minute amounts in the atmosphere or soil gas. For chemicals with Henry's Law constants greater than $5 \times 10^{-3} \text{ atm}\cdot\text{m}^3$ per mole, volatilization and diffusion in soil gas could be significant.

5.2.1.7 Bioconcentration Factor

The BCF represents the ratio of aquatic animal-tissue concentration to water concentration. The ratio is both contaminant and species specific. When site-specific values are not measured, literature values are used or BCFs are derived from K_{ow} values. Many PAHs will bioconcentrate in aquatic animal tissue at levels three to five orders of magnitude greater than those concentrations found in the water in which the organisms reside, whereas TCE does not bioconcentrate to any significant degree.

5.2.1.8 Distribution Coefficient

The distribution coefficient (K_d) is a measure of the equilibrium distribution of a chemical or ion in soil/water systems. The distribution of organic chemicals is a function of both the K_{oc} and the amount of organic carbon in the soil. For an ion (e.g., metal), the K_d is the ratio of the concentration adsorbed on soil surfaces to the concentration in water. K_d values for metals vary over several orders of magnitude because the K_d is dependent on the size and charge of the ion and the soil properties governing exchange sites on soil surfaces. Coulomb's Law predicts that the ion with the smallest hydrated radius and the largest charge will be preferentially accumulated over ions with larger radii and smaller charges.

5.2.1.9 Mobility Index

The mobility index (MI) is a quantitative assessment of chemical mobility in the environment based on the water solubility (S), vapor pressure (VP), and the K_{oc} of a given material (Laskowski et al., 1983) as follows:

$$MI = \log ((S*VP)/K_{oc})$$

The MI for a given chemical is evaluated using the following scale (Ford and Gurba, 1984):

<u>Relative MI</u>	<u>Mobility Description</u>
> 5	extremely mobile
0 to 5	very mobile
-5 to 0	slightly mobile
-10 to -5	immobile
< -10	very immobile

TCE has a MI close to 5 and is considered very mobile. Pesticides such as BHC have MIs between -5 and -10 and are classified as immobile. Lighter molecular weight PAHs, such as naphthalene, have MIs

ranging from -5 to 0 and are considered slightly mobile, and heavier molecular weight PAHs (e.g., benzo(a)pyrene) are classified as very immobile, having MIs less than -10 (see Table 5-1).

5.2.2 VOCs

The predominant VOCs detected at Site 3, halogenated aliphatics including PCE, TCE, and DCE, are generally volatile at normal temperatures and are typically considered fairly soluble in water with a low capacity for retention by soil organic carbon; therefore, these organic compounds are frequently detected in groundwater. The high volatility and water solubility of these chemicals dominate their fate in the environment. These chemicals may migrate through the soil column after being released by a spill event or by subsurface waste burial as infiltrating precipitation solubilizes them. Some fraction of these chemicals is retained by the soil, but most will continue migrating downward to the water table. Upon reaching the water table, migration occurs primarily in the direction of the horizontal hydraulic gradient.

Compounds with specific gravities greater than that of water (e.g., TCE) are often used in various industrial applications such as degreasing. If a large enough spill of these solvents occurs, these chemicals may also migrate as a bulk liquid but will not stop at the water table (i.e., these chemicals will mix with and/or sink into the aquifer).

In general, CVOCs are subject to abiotic dehydrohalogenation. This process is an elimination reaction that results in the formation of an ethene from a saturated halogenated compound. Research indicates that microbial degradation of highly chlorinated ethanes is a relatively slow process. Chlorinated ethenes are subject to degradation via the action of soil microorganisms. The biodegradation of these compounds in the soil matrix is dependent on the abundance of microflora, nutrient availability, soil reaction (pH), temperature, etc. However, the continued presence of CVOCs at the site over time suggests that one or more factors are limiting the reductive dechlorination process.

Monocyclic aromatics such as benzene are subject to degradation via the action of both soil and aquatic microorganisms. The biodegradation of these compounds in the soil matrix is dependent on the abundance of microflora, macronutrient availability, soil reaction (pH), temperature, etc. Although these compounds are amenable to microbial degradation, it is not anticipated that degradation will occur at an appreciable rate at Site 3, although macronutrient availability is not known.

Under certain conditions, volatilization is a significant fate process for these compounds. Volatilization is only significant at the air-soil or air-water interface. Compounds may volatilize rapidly to the atmosphere from soil or surface water due to low soil adsorption. Adsorption is not considered an important fate for

these types of compounds when compared to more hydrophobic compounds. BCFs indicate that these compounds should not bioaccumulate.

5.2.3 PAHs

The SVOCs most frequently detected at Site 3 include bis(2-ethylhexyl)phthalate and PAHs. SVOCs as a class of compounds, and PAHs in particular, are considered persistent in the environment. SVOCs in soil are much more likely to bind to soil and be transported via mass transport mechanisms than to go into solution. PAHs are subject to degradation via aerobic bacteria but may be relatively persistent in the absence of microbial population or macronutrients such as phosphorus and nitrogen. Land-spreading applications have indicated that PAHs are highly amenable to microbial degradation in soil. The rate of degradation is influenced by temperature, pH, oxygen concentrations, initial chemical concentrations, and moisture. Photolysis, hydrolysis, and oxidation are not important fate processes for the degradation of PAHs in soil.

SVOCs are generally considered fairly immobile chemicals in the environment because they are large molecules with high K_{oc} values and low solubilities compared to volatile organics. However, some of the lighter molecular weight PAHs (a subgroup of SVOCs) are more water soluble and environmentally mobile. SVOC compounds in soil generally do not migrate vertically to a great extent and are more likely to adhere to soil particles and be removed from the site via surface runoff and erosional processes.

PAHs are frequently released to the environment through emissions from the incineration of municipal and chemical wastes and in exhaust from internal combustion engines. The PAHs detected at Site 3 may be a by-product of wastes burned at the site.

PAHs generally have very low solubilities, vapor pressures, and Henry's Law constants and high K_{oc} and K_{ow} values. The low molecular weight PAHs (e.g., acenaphthene, anthracene, fluorene, and phenanthrene) may volatilize from surface waters and high molecular weight PAHs (e.g., benzo(a)pyrene, benzo(a)anthracene, chrysene, etc.) are less likely to volatilize.

5.2.4 Pesticides

Pesticides can enter the environment by spraying, dusting, or direct application to soil. Pesticides are expected to have been used as part of golf course maintenance activities at Site 3 and applied per manufacturers' instructions. Many of the compounds detected are no longer licensed for general sale and use in the United States. Pesticides as a class of compounds are not considered very mobile in the

environment. These chemicals, upon application or disposal, tend to remain affixed to soil particles. Migration of pesticides generally occurs primarily by erosion via the action of wind or water.

Bioconcentration of pesticides in the food chain is another important fate mechanism. Hydrolysis, oxidation, and photolysis are not generally important fate mechanisms for pesticides in soil or water. Hydrolysis half-lives for several pesticides are reported in periods of months to years. Fate and transport information for some of the more common pesticides detected at Site 3 is summarized as follows:

- **4,4' DDT and its metabolites** are considered to be persistent chemicals. They undergo extensive adsorption to soil and are not highly soluble. Biodegradation may occur under both aerobic and anaerobic conditions in the presence of certain soil microorganisms. Under aerobic conditions, 4,4'-DDT may be transformed to DDE, and under anaerobic conditions, 4,4'-DDD may result. These compounds are, however, somewhat volatile, with a reported half-life of 100 days for 4,4'-DDT. These compounds are highly lipophilic and therefore readily bioaccumulate. 4,4'-DDT is no longer in production in the United States.
- **Aldrin** is readily converted to **dieldrin**. Dieldrin is a particularly persistent pesticide but is no longer registered for general use. In soil, dieldrin will persist for long periods (more than 7 years) and may slowly evaporate. It does not readily leach to groundwater. Once in surface waters (via runoff), dieldrin adsorbs strongly to sediment and bioconcentrates and slowly photodegrades. Biodegradation and hydrolysis are not significant.
- **Endrin and its metabolites** are no longer produced or used in the United States. These compounds will remain in soil and do not leach significantly, with half-lives of greater than 14 years in sediment. One common transportation and degradation mechanism is photochemical degradation. In water, endrin would not be expected to biodegrade or hydrolyze to any significant extent and therefore will bioconcentrate in aquatic organisms.
- **Chlordane** is extremely persistent in the environment and, in some soils, may persist for greater than 20 years. Volatilization is an important removal mechanism in water and soil. Leaching to groundwater may occur where there are high levels of organic solvents.
- The use of **heptachlor** was restricted to underground termite control in 1983. Heptachlor epoxide is formed by the biological transformation of heptachlor in the environment. These compounds sorb strongly to soil. Heptachlor is subject to biodegradation (forming heptachlor epoxide, which is highly resistant to biodegradation) and hydrolysis. Bioconcentration of both compounds is significant, and volatilization and photolysis are very slow.

5.2.5 PCBs

PCBs were detected only in sediment samples at Site 3. Their presence in sediment, but not in any aqueous samples, is evidence of their low water solubility and tendency to adhere to particulate matter. PCBs are considered very persistent organic chemicals. Biodegradation is the only process known to transform PCBs under environmental conditions, and only the lighter compounds are measurably biodegraded. Although some microorganisms may biodegrade PCBs, such biota may not exist in local soil. There is experimental evidence to suggest that heavier PCBs (five or more chlorines per molecule) can undergo photolytic degradation, but there are no data to suggest that this process operates under environmental conditions. Base-, acid-, and neutral-promoted hydrolysis are considered inconsequential degradation mechanisms for PCBs.

5.2.6 Metals

Metals are highly persistent environmental contaminants. They do not biodegrade, photolyze, or hydrolyze. Metals released to the environment generally adsorb to the soil matrix (compared to being part of the soil structure) and bioaccumulate. Because metals are frequently incorporated into the soil matrix and remain bound to particulate matter, they migrate from source areas via bulk movement processes (erosion).

The mobility of metals is influenced primarily by their physical and chemical properties, in combination with the physical and chemical characteristics of the soil matrix. Factors that assist in predicting the mobility of inorganic species are the soil/pore water pH, soil/pore water oxidation reduction potential (Eh) of groundwater, and cation exchange capacity. The mobility of metals generally increases with decreasing soil pH and cation exchange capacity (see Table 5-2). Metals are more mobile under acidic conditions. In these cases, it is possible for metals to migrate vertically through the soil column and reach the groundwater.

The detected concentrations of arsenic in soil and sediment samples at Site 3 may be attributed to naturally occurring conditions. Pettry and Switzer (2001) evaluated arsenic concentrations in soil in Mississippi and reported data from five sample locations in the Coastal Flatwoods in Jackson County and one in Hancock County. The reported concentrations of arsenic in the Coastal Flatwoods samples ranged from 0.38 to 4.78 mg/kg. The arsenic levels reported at Site 3 were in the lower range of the background concentrations in the area.

5.3 CONTAMINANT MIGRATION

Transport of contaminants after they are released to the environment is controlled by the following:

- Nature and extent of contamination
- Physical properties of the contaminants
- Potential migration pathways

These factors determine whether the contaminant partitions to more mobile media (air or groundwater) or less mobile media (soil or sediment particles).

5.3.1 Site Conceptual Model

Buried waste in the landfill cells was considered the primary source for contaminants at the site. The primary release mechanism is the direct contact of subsurface soil and groundwater with the buried waste, leaching of contaminants to soil and groundwater, and potential migration of liquid wastes disposed at the site.

Surface soil was considered a secondary source of contaminants because it is fill material of unknown origin emplaced after landfill operations had ceased and may have been affected by normal golf course activities not related to the landfill operation.

The potential pathways for contaminant migration at Site 3 are shown in Table 5-3.

5.3.2 Surface Soil/Subsurface Soil/Groundwater Pathway

The potential for contaminants to leach from surface soil to subsurface soil and groundwater is evaluated because contaminants were reported in Site 3 soil at concentrations greater than default leaching criteria. The analytes detected in each of these media are compared in Table 5-4 and summarized as follows:

- VOCs – The only VOC detected in surface soil samples, chloroform, was not detected in subsurface soil or groundwater samples. The CVOCs cis-1,2-DCE and vinyl chloride were detected in one subsurface soil sample collected at the site, and the vinyl chloride concentration in this subsurface soil sample exceeded the SSL for the soil leaching pathway. Based on the age of the landfill and widespread distribution of CVOCs dissolved in groundwater, continuing contribution to groundwater contamination from subsurface soil is expected to be minimal.

TABLE 5-3
CONTAMINANT MIGRATION PATHWAYS
SITE 3 REMEDIAL INVESTIGATION REPORT
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GULFPORT, MISSISSIPPI

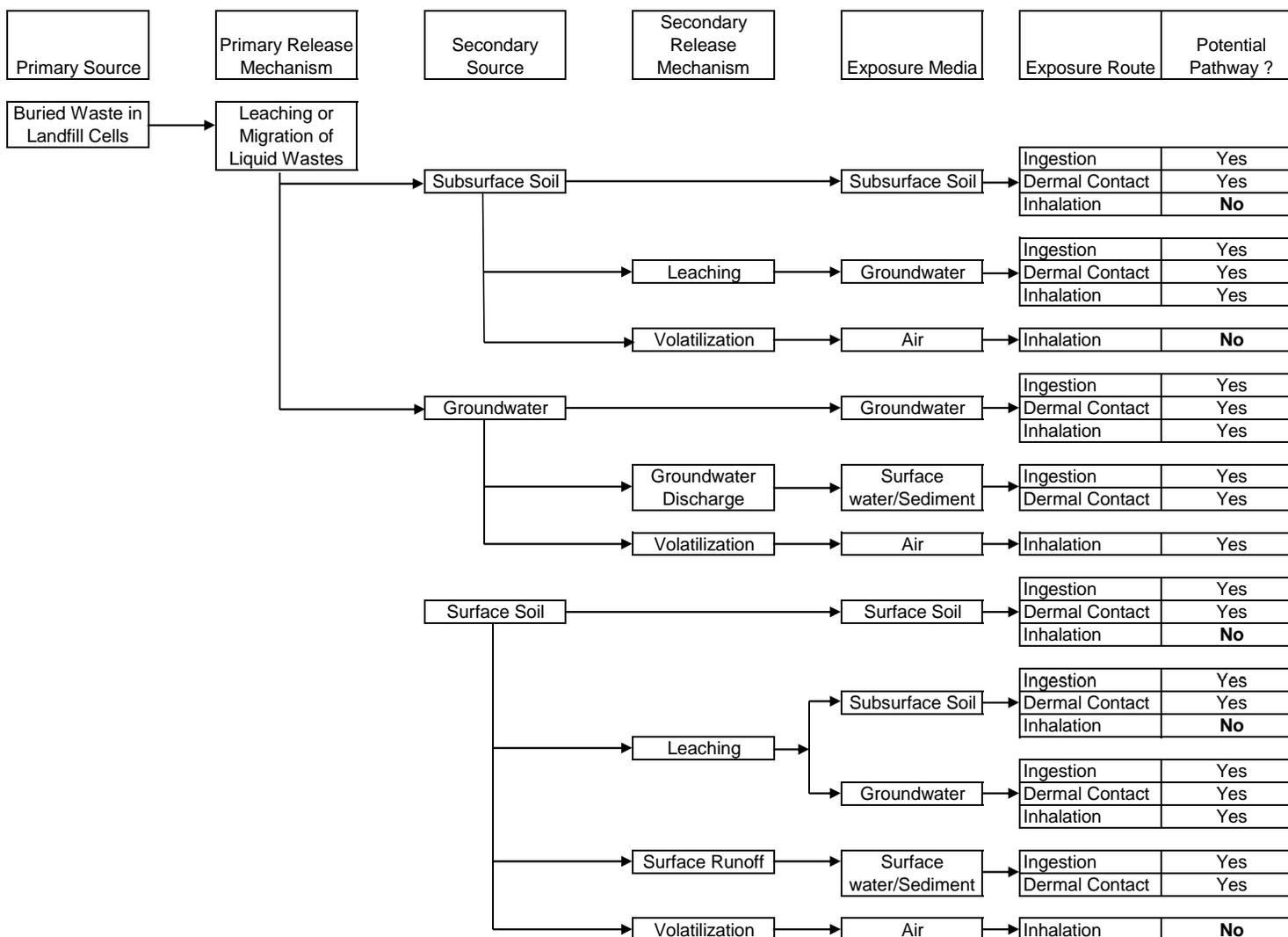


TABLE 5-4
COMPARISON OF CONTAMINANTS
SURFACE SOIL TO SUBSURFACE SOIL AND GROUNDWATER PATHWAY
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
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SURFACE SOIL

Parameter	Frequency	Maximum	Range
Volatile Organics (ug/kg)			
Chloroform	1/10	0.61	0.61
Semivolatile Organics (ug/kg)			
Benzo(a)anthracene	3/10	170	84 - 170
Benzo(a)pyrene	3/10	210	170 - 210
Benzo(b)fluoranthene	3/10	360	270 - 360
Benzo(g,h,i)perylene	1/10	100	100
Benzo(k)fluoranthene	3/10	240	200 - 240
Bis(2-Ethylhexyl)phthalate	6/10	280	52 - 280
Caprolactam	2/10	260	170 - 260
Chrysene	3/10	230	150 - 230
Fluoranthene	3/10	160	73 - 160
Pyrene	3/10	370	140 - 370
Pesticides (ug/kg)			
4,4'-DDD	4/10	3.3	0.73 - 3.3
4,4'-DDE	4/10	4.9	0.73 - 4.9
4,4'-DDT	5/10	17	0.29 - 17
ALDRIN	2/10	0.66	0.31 - 0.66
alpha-BHC	4/10	0.68	0.22 - 0.68
beta-BHC	3/10	0.19	0.11 - 0.19
gamma-BHC (Lindane)	5/10	1.2	0.45 - 1.2
Alpha-Chlordane	7/10	26	0.14 - 26
Gamma-Chlordane	6/10	14	0.098 - 14
Dieldrin	6/10	3.7	0.17 - 3.7
Endosulfan II	4/10	1.5	0.28 - 1.5
Endosulfan sulfate	1/10	2.1	2.1
Endrin	1/10	0.62	0.62
Endrin aldehyde	2/10	0.45	0.18 - 0.45
Heptachlor Epoxide	3/10	0.47	0.23 - 0.47
Herbicides (ug/kg)			
Dinoseb	1/10	14	14

SUBSURFACE SOIL

Parameter	Frequency	Maximum	Range
Volatile Organics (ug/kg)			
2-Butanone	1/10	1.9	1.9
4-Methyl-2-pentanone	1/10	1.1	1.1
Carbon Disulfide	1/10	6	6
Semivolatile Organics (ug/kg)			
cis-1,2-dichloroethene	1/10	3.2	3.2
Pesticides (ug/kg)			
Bis(2-Ethylhexyl)phthalate	1/10	480	480
Herbicides (ug/kg)			
Chrysene	1/10	46	46
Pesticides (ug/kg)			
4,4'-DDD	2/10	1.2	1 - 1.2
4,4'-DDE	2/10	0.53	0.34 - 0.53
4,4'-DDT	4/10	1.7	0.23 - 1.7
Semivolatile Organics (ug/kg)			
beta-BHC	4/10	2.1	0.32 - 2.1
gamma-BHC (Lindane)	2/10	0.6	0.41 - 0.6
Herbicides (ug/kg)			
Gamma-Chlordane	4/10	0.49	0.2 - 0.49
Pesticides (ug/kg)			
Heptachlor	1/10	0.55	0.55
Heptachlor Epoxide	3/10	0.78	0.23 - 0.78
Herbicides (ug/kg)			

GROUNDWATER

Parameter	Frequency	Maximum	Range
Volatile Organics (ug/L)			
1,1-Dichloroethene	2/95	2.2	0.7 - 2.2
1,2,4-Trichlorobenzene	1/95	1.2	1.2
1,2-Dichloroethane	3/95	1.6	1.4 - 1.6
Benzene	10/95	12	0.14 - 12
Chlorobenzene	2/95	1.1	1.1
Chloromethane	1/95	10	10
cis-1,2-dichloroethene	39/95	880	0.87 - 880
Cyclohexane	1/14	1	1
Methyl Cyclohexane	2/14	2.2	2.1 - 2.2
Methylene Chloride	2/95	14	12 - 14
Trans-1,2-dichloroethene	17/95	87.4	0.16 - 87.4
Trichloroethene	21/95	300	0.3 - 300
Vinyl Chloride	30/95	150	0.34 - 150
Semivolatile Organics (ug/L)			
Herbicides (ug/kg)			
Caprolactam	1/24	0.47	0.47
Pesticides (ug/kg)			
2,4-Dinitrotoluene	1/24	0.63	0.63
Herbicides (ug/kg)			

TABLE 5-4
COMPARISON OF CONTAMINANTS
SURFACE SOIL TO SUBSURFACE SOIL AND GROUNDWATER PATHWAY
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SURFACE SOIL

Parameter	Frequency	Maximum	Range
Inorganics (mg/kg)			
Aluminum	10/10	7300	2670 - 7300
Antimony	1/10	1.2	1.2
Arsenic	10/10	6	1.1 - 6
Barium	10/10	23.2	6.7 - 23.2
Cadmium	1/10	0.91	0.91
Calcium	6/10	4560	497 - 4560
Chromium	10/10	10.6	2.8 - 10.6
Cobalt	3/10	2.1	1.1 - 2.1
Copper	5/10	15.2	1.3 - 15.2
Iron	10/10	12900	2560 - 12900
Lead	10/10	59.3	2.6 - 59.3
Magnesium	2/10	1080	277 - 1080
Manganese	10/10	44.2	1.9 - 44.2
Mercury	5/10	0.08	0.014 - 0.08
Nickel	7/10	8	1.4 - 8
Selenium	1/10	0.68	0.68
Vanadium	10/10	18.8	5.1 - 18.8
Zinc	10/10	255	1.7 - 255
Cyanide	1/10	0.14	0.14

SUBSURFACE SOIL

Parameter	Frequency	Maximum	Range
Inorganics (mg/kg)			
Aluminum	10/10	7280	443 - 7280
Arsenic	2/10	2.4	0.79 - 2.4
Barium	10/10	24.1	2.5 - 24.1
Calcium	2/10	378	260 - 378
Chromium	10/10	7.5	1 - 7.5
Copper	1/10	1.3	1.3
Iron	10/10	6640	107 - 6640
Lead	5/10	5.9	2.2 - 5.9
Magnesium	1/10	238	238
Manganese	10/10	4.4	0.74 - 4.4
Mercury	1/10	0.024	0.024
Nickel	1/10	1.3	1.3
Vanadium	7/10	13.8	2 - 13.8
Zinc	6/10	7.7	1.2 - 7.7

GROUNDWATER

Parameter	Frequency	Maximum	Range
Inorganics (ug/L)			
Aluminum	23/24	58900	59.1 - 58900
Arsenic	10/24	287	10.6 - 287
Barium	24/24	378	28 - 378
Beryllium	3/24	2.1	1.1 - 2.1
Calcium	24/24	88400	2610 - 88400
Chromium	13/24	53.3	2.2 - 53.3
Cobalt	1/24	5.2	5.2
Copper	1/24	13.7	13.7
Iron	24/24	33500	2660 - 33500
Lead	8/24	19.4	1.6 - 19.4
Magnesium	24/24	8510	1230 - 8510
Manganese	24/24	235	31.8 - 235
Mercury	1/24	0.18	0.18
Nickel	5/24	18.9	5.4 - 18.9
Potassium	21/24	5450	1250 - 5450
Selenium	1/24	8.2	8.2
Sodium	24/24	63200	5350 - 63200
Thallium	1/24	3.7	3.7
Vanadium	7/24	78.2	5.3 - 78.2
Zinc	18/24	41.7	5 - 41.7

- SVOCs – Bis(2-ethylhexyl) phthalate was detected in surface and subsurface soil samples collected at Site 3. Concentrations in the surface soil were less than screening criteria.
- Pesticides – BHC isomers and dieldrin were detected in Site 3 surface soil samples at concentrations greater than SSLs for the soil leaching pathway. Only beta- and gamma-BHC were detected in subsurface soil samples. Pesticides were not detected in groundwater samples.
- Metals – A number of metals were frequently detected in all of the media sampled at Site 3. Aluminum, antimony, arsenic, cadmium, chromium, cobalt, and selenium were detected in one or more surface soil samples at concentrations greater than SSLs for the soil leaching pathway. Only aluminum, arsenic, and chromium were detected in subsurface soil samples at concentrations greater than these SSLs. Aluminum and arsenic were detected in groundwater samples at concentrations exceeding screening criteria. Although surface and subsurface soil may be leaching aluminum and arsenic to groundwater, the concentrations of these metals in site soils may be consistent with regional background concentrations.

5.3.3 Surface Soil/Surface Water/Sediment Pathway

Because contaminants were detected in surface soil samples at concentrations exceeding screening criteria, the surface soil-to-sediment and surface water pathways are evaluated. The site was capped with fill material of unknown origin at some time after landfill operations ceased. Routine golf course maintenance activities, which may have included pesticide applications, have been conducted in the subsequent years. The analytes detected in each of these media are compared in Table 5-5 and summarized as follows:

- VOCs – The only VOC reported in surface soil samples, chloroform, was not detected in surface water or sediment samples collected at Site 3. Acetone was detected in surface water and sediment samples collected at Site 3 at concentrations less than screening criteria.
- SVOCs – Bis(2-ethylhexyl) phthalate was detected in surface soil and surface water samples collected at Site 3. Concentrations in surface soil were less than screening criteria. The one bis(2-ethylhexyl) phthalate detection in Site 3 surface water did exceed screening criteria; however, this sample was collected from Golf Course Pond, which does not receive runoff from the landfill area. Other SVOCs detected in surface soil samples were not detected in surface water or sediment samples.

TABLE 5-5
COMPARISON OF CONTAMINANTS
SURFACE SOIL TO SEDIMENT AND SURFACE WATER PATHWAYS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

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SURFACE SOIL

Parameter	Frequency	Maximum	Range
Volatile Organics (ug/kg)			
Chloroform	1/10	0.61	0.61
Semivolatile Organics (ug/kg)			
Benzo(a)anthracene	3/10	170	84 - 170
Benzo(a)pyrene	3/10	210	170 - 210
Benzo(b)fluoranthene	3/10	360	270 - 360
Benzo(g,h,i)perylene	1/10	100	100
Benzo(k)fluoranthene	3/10	240	200 - 240
Bis(2-Ethylhexyl)phthalate	6/10	280	52 - 280
Caprolactam	2/10	260	170 - 260
Chrysene	3/10	230	150 - 230
Fluoranthene	3/10	160	73 - 160
Pyrene	3/10	370	140 - 370
Pesticides (ug/kg)			
4,4'-DDD	4/10	3.3	0.73 - 3.3
4,4'-DDE	4/10	4.9	0.73 - 4.9
4,4'-DDT	5/10	17	0.29 - 17
Aldrin	2/10	0.66	0.31 - 0.66
alpha-BHC	4/10	0.68	0.22 - 0.68
beta-BHC	3/10	0.19	0.11 - 0.19
gamma-BHC (Lindane)	5/10	1.2	0.45 - 1.2
Alpha-Chlordane	7/10	26	0.14 - 26
Gamma-Chlordane	6/10	14	0.098 - 14
Dieldrin	6/10	3.7	0.17 - 3.7
Endosulfan II	4/10	1.5	0.28 - 1.5
Endosulfan sulfate	1/10	2.1	2.1
Endrin	1/10	0.62	0.62
Endrin aldehyde	2/10	0.45	0.18 - 0.45
Heptachlor Epoxide	3/10	0.47	0.23 - 0.47
PCBs (ug/kg)			
Herbicides (ug/kg)			
Dinoseb	1/10	14	14
Inorganics (mg/kg)			
Aluminum	10/10	7300	2670 - 7300
Antimony	1/10	1.2	1.2
Arsenic	10/10	6	1.1 - 6
Barium	10/10	23.2	6.7 - 23.2
Cadmium	1/10	0.91	0.91
Calcium	6/10	4560	497 - 4560
Chromium	10/10	10.6	2.8 - 10.6
Cobalt	3/10	2.1	1.1 - 2.1
Copper	5/10	15.2	1.3 - 15.2
Iron	10/10	12900	2560 - 12900
Lead	10/10	59.3	2.6 - 59.3
Magnesium	2/10	1080	277 - 1080
Manganese	10/10	44.2	1.9 - 44.2
Mercury	5/10	0.08	0.014 - 0.08
Nickel	7/10	8	1.4 - 8
Selenium	1/10	0.68	0.68
Vanadium	10/10	18.8	5.1 - 18.8
Zinc	10/10	255	1.7 - 255
Cyanide	1/10	0.14	0.14

SEDIMENT

Parameter	Frequency	Maximum	Range
Volatile Organics (ug/kg)			
Acetone	9/10	160	18 - 160
Carbon Disulfide	1/10	7	7
Semivolatile Organics (ug/kg)			
Pesticides (ug/kg)			
4,4'-DDD	3/10	3.1	1.7 - 3.1
4,4'-DDE	4/10	3.7	1.4 - 3.7
4,4'-DDT	3/10	9.8	4.4 - 9.8
alpha-BHC	2/10	2.1	1.8 - 2.1
delta-BHC	1/10	2	2
gamma-BHC (Lindane)	1/10	2	2
Alpha-Chlordane	2/10	3.3	2.2 - 3.3
Gamma-Chlordane	2/10	2.1	1.5 - 2.1
Dieldrin	3/9	2.8	1.9 - 2.8
Endrin Ketone	1/10	3.2	3.2
PCBs (ug/kg)			
Aroclor-1254	3/10	86	35 - 86
Aroclor-1260	4/10	130	32 - 130
Total Aroclor	4/10	216	56 - 216
Herbicides (ug/kg)			
Inorganics (mg/kg)			
Aluminum	10/10	15600	713 - 15600
Arsenic	6/10	13.2	2.9 - 13.2
Barium	10/10	38.3	1.7 - 38.3
Calcium	8/10	892	74.4 - 892
Chromium	10/10	17.1	1.4 - 17.1
Cobalt	5/10	2	0.84 - 2
Copper	7/10	9.3	2.3 - 9.3
Iron	10/10	12000	579 - 12000
Lead	9/10	22	2.6 - 22
Magnesium	10/10	568	33.2 - 568
Manganese	10/10	33.4	1.7 - 33.4
Mercury	6/10	0.07	0.01 - 0.07
Nickel	6/10	6.2	3 - 6.2
Sodium	2/10	39	37.4 - 39
Vanadium	10/10	25.4	1.3 - 25.4
Zinc	10/10	57.5	1.3 - 57.5

SURFACE WATER

Parameter	Frequency	Maximum	Range
Volatile Organics (ug/kg)			
Acetone	1/8	4	4
Semivolatile Organics (ug/kg)			
Bis(2-Ethylhexyl)phthalate	1/8	19	19
Pesticides (ug/kg)			
PCBs (ug/kg)			
Herbicides (ug/kg)			
Inorganics (mg/kg)			
Aluminum	1/8	427	427
Barium	8/8	53.3	1.9 - 53.3
Calcium	8/8	22000	2680 - 22000
Copper	2/8	15.5	13 - 15.5
Iron	7/8	3680	135 - 3680
Lead	2/8	1.9	1.9
Magnesium	8/8	4150	1720 - 4150
Manganese	8/8	98.2	8 - 98.2
Potassium	2/8	6010	5520 - 6010
Selenium	1/8	4.7	4.7
Sodium	8/8	21600	13400 - 21600
Zinc	7/8	13.4	3.4 - 13.4

- Pesticides – BHC isomers and dieldrin were detected in Site 3 surface soil samples at concentrations greater than SSLs for the soil leaching pathway. Alpha-BHC and dieldrin were detected in sediment samples at concentrations less than screening criteria. Pesticides were not detected in surface water samples.
- Metals – Arsenic was detected in all Site 3 surface soil samples and in many of the sediment samples. Where detected, the arsenic concentrations were greater than screening criteria but generally less than typical arsenic concentrations for soils in the Mississippi Coastal Plain.

5.3.4 Groundwater/Surface Water/Sediment Pathway

Canal No. 1 is a gaining stream that may receive groundwater discharge from Site 3. Therefore, the groundwater-to-surface water and sediment pathways are evaluated. The analytes detected in each of these media are compared in Table 5-6 and summarized as follows:

- VOCs – Acetone was the only VOC detected in groundwater, surface water, and sediment samples collected at Site 3. The acetone concentrations in these samples were less than screening criteria in all media.
- SVOCs – The two SVOCs detected in groundwater samples, 2,4-dinitrotoluene and caprolactam, were not detected in surface water or sediment samples collected at Site 3.
- Metals – Arsenic was detected in many Site 3 groundwater and sediment samples. Based on the range of concentrations reported in Site 3 groundwater samples, 200 µg/L and less, it is unlikely that groundwater discharging to Canal No. 1 contributes significantly to the arsenic levels in sediment (3 to 13 mg/kg).

5.3.5 Soil and Groundwater to Air Pathway

To determine the potential for migration of soil or groundwater contaminants to the atmosphere, contaminant concentrations in these media were compared to USEPA SSLs (surface and subsurface soil) and USEPA groundwater volatilization criteria. Table 5-7 compares the analytes detected in each of these media. SSLs have been established for various volatiles, pesticides/PCBs, and metals. Concentrations of these classes of analytes detected in soil at Site 3 were less than the default SSLs. Surface soil- and subsurface soil-to-air and inhalation pathways are not considered complete because concentrations of contaminants detected in soil were less than the default SSLs.

TABLE 5-6
CONTAMINANT COMPARISON
GROUNDWATER TO SURFACE WATER AND SEDIMENT PATHWAYS
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
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GROUNDWATER

Parameter	Frequency	Maximum	Range
Volatile Organics (ug/L)			
Acetone	1/105	13.9	13.9
Benzene	0	12	0.14 - 12
Chlorobenzene	3/105	1.1	1.1
Chloromethane	1/105	10	10
1,2-Dichloroethane	3/105	1.6	1.4 - 1.6
1,1-Dichloroethene	3/105	2.2	0.7 - 2.2
cis-1,2-dichloroethene	48/105	880	0.87 - 880
Trans-1,2-dichloroethene	22/105	87.4	0.16 - 87.4
Methylene Chloride	2/105	14	12 - 14
1,2,4-Trichlorobenzene	1/105	1.2	1.2
Trichloroethene	24/105	300	0.3 - 300
Vinyl Chloride	36/105	150	0.34 - 150
Semivolatile Organics (ug/L)			
2,4-Dinitrotoluene	1/24	0.63	0.63
Caprolactam	1/24	0.47	0.47
Inorganics (ug/L)			
Aluminum	23/24	58900	59.1 - 58900
Arsenic	10/24	287	10.6 - 287
Barium	24/24	378	28 - 378
Beryllium	3/24	2.1	1.1 - 2.1
Calcium	24/24	88400	2610 - 88400
Chromium	13/24	53.3	2.2 - 53.3
Cobalt	1/24	5.2	5.2
Copper	1/24	13.7	13.7
Iron	24/24	33500	2660 - 33500
Lead	8/24	19.4	1.6 - 19.4
Magnesium	24/24	8510	1230 - 8510
Manganese	24/24	235	31.8 - 235
Mercury	1/24	0.18	0.18
Nickel	5/24	18.9	5.4 - 18.9
Potassium	21/24	5450	1250 - 5450
Selenium	1/24	8.2	8.2
Sodium	24/24	63200	5350 - 63200
Thallium	1/24	3.7	3.7
Vanadium	7/24	78.2	5.3 - 78.2
Zinc	18/24	41.7	5 - 41.7

SURFACE WATER

Parameter	Frequency	Maximum	Range
Volatile Organics (ug/L)			
Acetone	1/8	4	4
Semivolatile Organics (ug/L)			
Bis(2-Ethylhexyl)phthalate	1/8	19	19
Inorganics (ug/L)			
Aluminum	1/8	427	427
Barium	8/8	53.3	1.9 - 53.3
Calcium	8/8	22000	2680 - 22000
Copper	2/8	15.5	13 - 15.5
Iron	7/8	3680	135 - 3680
Lead	2/8	1.9	1.9
Magnesium	8/8	4150	1720 - 4150
Manganese	8/8	98.2	8 - 98.2
Potassium	2/8	6010	5520 - 6010
Selenium	1/8	4.7	4.7
Sodium	8/8	21600	13400 - 21600
Zinc	7/8	13.4	3.4 - 13.4

SEDIMENT

Parameter	Frequency	Maximum	Range
Volatile Organics (ug/L)			
Acetone	9/10	160	18 - 160
Carbon Disulfide	1/10	7	7
Semivolatile Organics (ug/L)			
Inorganics (ug/L)			
Aluminum	10/10	15600	713 - 15600
Arsenic	6/10	13.2	2.9 - 13.2
Barium	10/10	38.3	1.7 - 38.3
Calcium	8/10	892	74.4 - 892
Chromium	10/10	17.1	1.4 - 17.1
Cobalt	5/10	2	0.84 - 2
Copper	7/10	9.3	2.3 - 9.3
Iron	10/10	12000	579 - 12000
Lead	9/10	22	2.6 - 22
Magnesium	10/10	568	33.2 - 568
Manganese	10/10	33.4	1.7 - 33.4
Mercury	6/10	0.07	0.01 - 0.07
Nickel	6/10	6.2	3 - 6.2
Sodium	2/10	39	37.4 - 39
Vanadium	10/10	25.4	1.3 - 25.4
Zinc	10/10	57.5	1.3 - 57.5

TABLE 5-7
POTENTIAL MEDIA TO AIR PATHWAY CONTAMINANTS
SITE 3 RI REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
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SURFACE SOIL				
Parameter	Frequency	Maximum	Range	SSL
Volatile Organics (ug/kg)				
Chloroform	1/10	0.61	0.61	280
Pesticides (ug/kg)				
4,4'-DDT	5/10	17	0.29 - 17	750000
Aldrin	2/10	0.66	0.31 - 0.66	3400
alpha-BHC	4/10	0.68	0.22 - 0.68	750
beta-BHC	3/10	0.19	0.11 - 0.19	6000
Alpha-Chlordane	7/10	26	0.14 - 26	7200
Gamma-Chlordane	6/10	14	0.098 - 14	7200
Dieldrin	6/10	3.7	0.17 - 3.7	1100
Inorganics (mg/kg)				
Heptachlor Epoxide	3/10	0.47	0.23 - 0.47	4700
Aluminum	10/10	7300	2670 - 7300	709000
Arsenic	10/10	6	1.1 - 6	769
Barium	10/10	23.2	6.7 - 23.2	70900
Cadmium	1/10	0.91	0.91	1840
Chromium	10/10	10.6	2.8 - 10.6	276
Cobalt	3/10	2.1	1.1 - 2.1	1180
Manganese	10/10	44.2	1.9 - 44.2	7090

SUBSURFACE SOIL				
Parameter	Frequency	Maximum	Range	SSL
Volatile Organics (ug/kg)				
2-Butanone	1/10	1.9	1.9	2400000
4-Methyl-2-pentanone	1/10	1.1	1.1	2700000
Carbon Disulfide	1/10	6	6	720000
Pesticides (ug/kg)				
cis-1,2-dichloroethene	1/10	3.2	3.2	NA
Inorganics (mg/kg)				
Vinyl Chloride	1/10	3.7	3.7	280
4,4'-DDT	4/10	1.7	0.23 - 1.7	750000
Inorganics (mg/kg)				
beta-BHC	4/10	2.1	0.32 - 2.1	6000
Gamma-Chlordane	4/10	0.49	0.2 - 0.49	72000
Inorganics (mg/kg)				
Heptachlor	1/10	0.55	0.55	4100
Heptachlor Epoxide	3/10	0.78	0.23 - 0.78	4700
Inorganics (mg/kg)				
Aluminum	10/10	7280	443 - 7280	70900
Arsenic	2/10	2.4	0.79 - 2.4	769
Barium	10/10	24.1	2.5 - 24.1	70900
Inorganics (mg/kg)				
Chromium	10/10	7.5	1 - 7.5	276
Inorganics (mg/kg)				
Manganese	10/10	4.4	0.74 - 4.4	7090

GROUNDWATER				
Parameter	Frequency	Maximum	Range	GWVC
Volatile Organics (ug/L)				
1,1-Dichloroethene	3/105	2.2	0.7 - 2.2	190
1,2,4-Trichlorobenzene	1/105	1.2	1.2	3400
1,2-Dichloroethane	3/105	1.6	1.4 - 1.6	5
Benzene	13/105	12	0.14 - 12	5
Chlorobenzene	3/105	1.1	1.1	390
Chloromethane	1/105	10	10	6.7
cis-1,2-dichloroethene	48/105	880	0.87 - 880	210
Methylene Chloride	2/105	14	12 - 14	58
Trans-1,2-dichloroethene	22/105	87.4	0.16 - 87.4	180
Trichloroethene	24/105	300	0.3 - 300	5
Vinyl Chloride	36/105	150	0.34 - 150	2
Pesticides (ug/kg)				
Inorganics (mg/kg)				

The USEPA GVCs have been established for many of the VOCs detected in groundwater at Site 3. Benzene, chloromethane, cis-1,2-DCE, TCE, and vinyl chloride were detected in one or more groundwater samples at concentrations greater than the default criteria, indicating the potential for migration and accumulation of vapors from groundwater. Given the undeveloped nature of the site at the current time, accumulation of vapors is unlikely. However, further evaluation of vapor migration will be needed if use of the site changes.

6.0 HUMAN HEALTH RISK ASSESSMENT

This baseline Human Health Risk Assessment (HHRA) was performed to characterize and quantify potential health risks at Site 3, Northwest Landfill, at NCBC Gulfport. The contamination at Site 3 originated from solid and liquid wastes that were disposed in trenches and burned. The liquid wastes consisted of fuels, oils, solvents, paints, and paint thinners. Solid wastes, such as infrastructure debris, were also disposed at the site. The objective of the risk assessment is to determine whether detected concentrations of chemicals within the study area pose a significant threat to potential human receptors under current and/or future land use. Cancer and non-cancer risk estimates were developed primarily using risk assessment procedures developed by the USEPA. However, the estimates are compared to risk benchmarks developed by the MDEQ and, secondarily, to risk benchmarks developed by the USEPA. Risk estimates are presented assuming current and future exposure to surface soil and hypothetical future exposure to groundwater.

The risk assessment for Site 3 is based on chemical data for surface soil, subsurface soil, groundwater, surface water, and sediment collected during the field investigation conducted in October 2006 and July to September 2007. The potential risks to human receptors are estimated based on the assumption that no actions are taken to control contaminant releases, whereas the presumptive remedy assumes that actions are taken. The baseline risk assessment consists of the following five major components:

- Data evaluation and identification of chemicals of potential concern (COPCs)
- Identification of significant exposure pathways
- Toxicity assessment
- Estimation of potential human health risks
- Characterization of uncertainty in the risk assessment

Section 6.1 lists the USEPA and MDEQ guidance used to prepare the baseline HHRA. Section 6.2 describes the methods used to evaluate data usability for the risk assessment. Methods for selecting COPCs evaluated quantitatively in the risk assessment are described in Section 6.3. COPCs were selected to represent those chemicals likely to have the highest potential health risk, based on chemical concentration, toxicity, and mobility. The COPC screening process involved comparing maximum site concentrations to risk-based screening levels.

Section 6.4 presents an overview of the Exposure Assessment, which characterizes potential receptor populations and the pathways by which they may be exposed to contaminants at the site. Discussions of current and future land uses, potential human receptors, exposure scenarios, and methods used to estimate

chemical intakes are included. In addition, specific exposure parameters used to calculate chemical intakes are presented. The chemical intake estimates were based on chemical concentrations at receptor locations, human activity patterns, physiological factors, and exposure duration and frequency. Current and reasonable future exposure scenarios were developed based on site characteristics, land use and zoning plans, human activity patterns, potential chemical migration pathways, and other pertinent information.

Section 6.5 presents an overview of the Toxicity Assessment and the chemical-specific toxicity criteria used in quantifying potential human health risks. When integrated with chemical intake estimates developed in the Exposure Assessment, these toxicity factors provide a basis for quantifying potential human health risks. Methods used for characterizing risks associated with non-carcinogenic and carcinogenic effects for exposure to COPCs are presented in Section 6.6.

The quantitative risk estimates presented in Section 6.6 are based on a number of assumptions about exposure and toxicity. Thus, the risk estimates may over- or underestimate the level of potential human health risks associated with a site. The Uncertainty Analysis (Section 6.7) describes in qualitative and semi-quantitative terms the sources of uncertainty in the risk assessment. Section 6.8 discusses the remedial goal options (RGOs) for Site 3. Section 6.9 presents the summary and conclusions of the risk assessment.

6.1 RISK ASSESSMENT GUIDANCE

The following guidance was used to prepare the HHRA:

- Risk Assessment Guidance for Superfund (RAGS), Volume I. Human Health Evaluation Manual, Part A. Interim Final (USEPA, 1989).
- RAGS, Volume I. Human Health Evaluation Manual: Standard Default Exposure Factors (USEPA, 1991b).
- Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening. Region 3 Technical Guidance Manual Risk Assessment (USEPA, 1993b).
- Distribution of Preliminary Review Draft, Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure (USEPA, 1993d).
- Soil Screening Guidance: Technical Background Document (USEPA, 1996b).
- Exposure Factors Handbook (USEPA, 1997c).

- RAGS, Human Health Evaluation Manual, Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments, RAGS Part D(USEPA, 2001d).
- Risk Evaluation Procedures for Voluntary Cleanup and Development of Brownfield Sites (MDEQ, 2002a).
- Supplemental Guidance For Developing Soil Screening Levels For Superfund Sites, Office of Solid Waste and Emergency Response, OSWER 9355.4-24, Washington, D.C. (USEPA, 2002b).
- Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous OSWER 9285.6-10. Waste Sites. Office of Emergency and Remedial Response, Washington, D.C. (USEPA, 2002c).
- Work Plan for RI at Site 3 – Northwest Landfill, NCBC, Gulfport, Mississippi (Tetra Tech, 2007).
- RAGS: Volume I, Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment, Interim Guidance (USEPA, 2004c).
- Guidelines for Carcinogen Risk Assessment (USEPA, 2005e).
- Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005f).

In addition, the USEPA's online database, Integrated Risk Information System (IRIS), was used to identify the most recently published toxicity criteria for the identified COPCs.

6.2 DATA EVALUATION

Information associated with data usability for Site 3 is provided in this section.

The HHRA presented in this report is based on the most recent analytical data collected at Site 3, the data collected as part of the field investigation conducted by Tetra Tech in October 2006 and July to September 2007.

Fixed-base laboratory analytical results for target analytes from the field investigation were used in the quantitative risk evaluation. Unfiltered results for groundwater and surface water were used to assess risks associated with these media. Field measurements and data regarded as unreliable (i.e., qualified as

"R" during the data validation process) were not used in the quantitative risk assessment. Analytical data qualified as estimated ("J" or "UJ") were used, even though the reported concentrations or sample-specific quantitation limits may be somewhat imprecise. The use of estimated data adds to the uncertainty associated with the risk assessment; however, the associated uncertainty is expected to be negligible compared with the other uncertainties inherent in the risk evaluation process (e.g., uncertainties with land uses, exposure scenarios, toxicological criteria, etc.). Analytical data qualified for blank contamination were used in the baseline risk assessment. When determining exposure concentrations via statistical procedures, analytical results qualified because of blank contamination and non-detect results were conservatively assumed present at concentrations equal to the sample-specific quantitation limit.

All analytical data used in the quantitative estimation of potential risks were validated.

6.3 SELECTION OF CHEMICALS OF POTENTIAL CONCERN

The selection of COPCs is a qualitative screening process used to limit the number of chemicals and exposure routes quantitatively evaluated in the HHRA to those site-related constituents that dominate overall potential risks. Screening of site data against risk-based concentrations (RBCs) is used to focus the risk assessment on meaningful chemicals and exposure routes.

In general, a chemical is selected as a COPC and retained for further quantitative risk evaluation in the HHRA if the maximum detection in a sampled medium exceeds a conservative screening value(s) and the chemical is determined to be present at concentrations exceeding background levels, if available. Chemicals eliminated from further evaluation at this time are assumed to present minimal risks to potential human receptors.

6.3.1 Derivation of Screening Criteria

Screening concentrations based on MDEQ TRGs, USEPA Region 9 PRGs, and USEPA MCLs were used to select COPCs for Site 3. The risk-based screening concentrations (i.e., those based on the Region 9 PRGs) correspond to a systemic hazard quotient (HQ) of 0.1 for non-carcinogens or a lifetime cancer risk of 1×10^{-6} for carcinogens. Region 9 PRGs are based on a HQ of 1.0, and the screening concentrations are based on a HQ of 0.1. The PRGs used as screening levels for non-carcinogenic chemicals have been divided by a factor of 10 to further account for the potential cumulative effects of several chemicals affecting the same target organ or producing the same adverse non-carcinogenic health effect.

Screening levels based on the following standards/criteria were used to select COPCs for soil:

- MDEQ Tier 1 TRGs for restricted and unrestricted land use (MDEQ, 2002b).
- USEPA Region 9 PRGs for Residential Soil (USEPA, 2004d). Some toxicity criteria in the October 2004 PRG table are outdated; these values were updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table (USEPA, 2007b).
- USEPA generic SSLs for the inhalation of volatiles and fugitive dusts calculated online at http://risk.lsd.ornl.gov/calc_start.shtml based on methodology from the USEPA's Soil Screening Guidance (USEPA, 1996b).

Screening levels based on the following criteria were used to select COPCs for sediment:

- MDEQ Tier 1 TRGs for restricted and unrestricted land use (MDEQ, 2002b).
- USEPA Region 9 PRGs for Residential Soil (USEPA, 2004d). Some toxicity criteria in the October 2004 PRG table are outdated; these values were updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table (USEPA, 2007b).

Screening levels based on the following criteria were used to select COPCs for groundwater and surface water:

- MDEQ Tier 1 TRGs for groundwater (MDEQ, 2002b).
- USEPA Region 9 PRGs for tap water (USEPA, 2004d). Some toxicity criteria in the October 2004 PRG table are outdated; these values were updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table.
- USEPA MCLs (USEPA, 2006).

If the maximum concentration of a constituent exceeds any of these criteria, the chemical was selected as a COPC and carried through the quantitative risk assessment.

Soil data were also compared to USEPA Generic SSLs for migration from soil to groundwater calculated online at http://risk.lsd.ornl.gov/calc_start.shtml based on methodology from USEPA's Soil Screening Guidance (USEPA, 1996b). The soil-to-groundwater SSLs were not used to select COPCs for

quantitative risk evaluation but to provide an evaluation of the potential impact of chemicals detected in soil or groundwater. Exceedances of the soil-to-groundwater SSLs are discussed in Section 6.3.2.

Essential Nutrients and Chemicals without Toxicity Criteria

The essential nutrients calcium, magnesium, potassium, and sodium were not identified as COPCs because these inorganic chemicals are naturally abundant in environmental matrices and are only toxic at high doses. In addition, because of the lack of toxicity criteria, risk-based COPC screening levels are not available for some chemicals (e.g., benzo(g,h,i)perylene, phenanthrene, alpha- and gamma-chlordane, delta-BHC, endosulfan II, endosulfan sulfate, and endrin aldehyde). Appropriate surrogates were selected for some of these chemicals based on similar chemical structures. Pyrene was used as the surrogate for benzo(g,h,i)perylene, chlordane was used as a surrogate for alpha- and gamma-chlordane, endosulfan was used as a surrogate for endosulfan II and endosulfan sulfate, and endrin was used as a surrogate for endrin aldehyde.

Determination of Site-Related Chemicals (Background Evaluation)

Background or upgradient sample data were available for some chemicals and media at Site 3. Therefore, a background screen (i.e., a comparison of site data to background data) was also used in the selection of COPCs, where applicable. To determine whether chemical concentrations were within background levels, a statistical analysis was conducted using the site and background data sets. In the cases where background data were available, the chemical was selected as a COPC if the maximum detected concentration exceeded the risk-based COPC screening level and was statistically determined to be greater than site background.

A discussion of the chemicals identified as COPCs and the rationale for their selection are provided in the following sections.

6.3.2 COPC Selection for Surface Soil

This section presents the results of the COPC selection process for surface soil. Table 6-1 presents the results of the comparison of maximum detected surface soil concentrations to USEPA Region 9 PRGs and MDEQ TRGs.

**TABLE 6-1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE SOIL
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TRGs Unrestricted Value ⁽⁵⁾	MDEQ TRGs Restricted Value ⁽⁵⁾	USEPA Region IX PRGs Residential ⁽⁶⁾	USEPA SSLs Soil to Air ⁽⁷⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁸⁾
Volatile Organic Compounds															
67-66-3	Chloroform	0.61 J	0.61 J	ug/kg	03SS0801	1/10	5 - 7.5	0.61	NA	312 C	478 C	220 C	280 C	No	BSL
Semivolatile Organic Compounds															
	Benzo(a)pyrene Equivalents	207.55	264.62	ug/kg	03SS0101	3/10	360 - 450	264.62	NA	87.5 C	784 C	15 C	NA	Yes	ASL
56-55-3	Benzo(a)anthracene	84 J	170 J	ug/kg	03SS0901	3/10	360 - 450	170	NA	875 C	7840 C	150 C	NA	Yes	ASL
50-32-8	Benzo(a)pyrene	170 J	210 J	ug/kg	03SS0101	3/10	360 - 450	210	NA	87.5 C	784 C	15 C	NA	Yes	ASL
205-99-2	Benzo(b)fluoranthene	270 J	360 J	ug/kg	03SS0101	3/10	360 - 450	360	NA	875 C	7840 C	150 C	NA	Yes	ASL
191-24-2	Benzo(g,h,i)perylene	100 J	100 J	ug/kg	03SS0901	1/10	360 - 450	100	NA	235000 N ⁽⁹⁾	6130000 N ⁽⁹⁾	230000 N ⁽⁹⁾	NA	No	BSL
207-08-9	Benzo(k)fluoranthene	200 J	240 J	ug/kg	03SS0101, 03SS0901	3/10	360 - 450	240	NA	8750 C	78400 C	1500 C	NA	No	BSL
117-81-7	Bis(2-ethylhexyl)phthalate	52 J	280 J	ug/kg	03SS0901	6/10	370 - 450	280	NA	45600 C	409000 C	35000 C	NA	No	BSL
105-60-2	Caprolactam	170 J	260 J	ug/kg	03SS0301	2/10	360 - 430	260	NA	3910000 N	10200000 N	3100000 N	NA	No	BSL
218-01-9	Chrysene	150 J	230 J	ug/kg	03SS0901	3/10	360 - 450	230	NA	87500 C	784000 C	15000 C ⁽¹⁰⁾	NA	No	BSL
206-44-0	Fluoranthene	73 J	160 J	ug/kg	03SS0101	3/10	360 - 450	160	NA	313000 N	8170000 N	230000 N	NA	No	BSL
129-00-0	Pyrene	140 J	370 J	ug/kg	03SS0101	3/10	360 - 450	370	NA	235000 N	6130000 N	230000 N	NA	No	BSL
Pesticides/PCBs															
72-54-8	4,4'-DDD	0.73 J	3.3 J	ug/kg	03SS1001	4/10	0.56 - 0.72	3.3	NA	2660 C	23800 C	2400 C	NA	No	BSL
72-55-9	4,4'-DDE	0.73 J	4.9	ug/kg	03SS0101	4/10	0.56 - 0.72	4.9	NA	1880 C	16800 C	1700 C	NA	No	BSL
50-29-3	4,4'-DDT	0.29 J	17 J	ug/kg	03SS1001	5/10	0.58 - 0.72	17	NA	1880 C	16800 C	1700 C	750000 C	No	BSL
309-00-2	Aldrin	0.31 J	0.66 J	ug/kg	03SS1001	2/10	0.28 - 0.36	0.66	NA	37.6 C	337 C	29 C	3400 C	No	BSL
319-84-6	alpha-BHC	0.22 J	0.68 J	ug/kg	03SS0701	4/10	0.28 - 0.36	0.68	NA	101 C	908 C	90 C	750 C	No	BSL
5103-71-9	alpha-Chlordane	0.14 J	26 J	ug/kg	03SS0901	7/10	0.29 - 0.36	26	NA	1820 C ⁽¹¹⁾	12300 C ⁽¹¹⁾	1600 C ⁽¹¹⁾	72000 C	No	BSL
319-85-7	beta-BHC	0.11 J	0.19 J	ug/kg	03SS0201	3/10	0.29 - 0.36	0.19	NA	355 C	3180 C	320 C	6000 C	No	BSL
60-57-1	Dieldrin	0.17 J	3.7 J	ug/kg	03SS0701	6/10	0.58 - 0.72	3.7	NA	39.9 C	358 C	30 C	1100 C	No	BSL
33213-65-9	Endosulfan II	0.28 J	1.5 J	ug/kg	03SS0901	4/10	0.56 - 0.72	1.5	NA	46900 N ⁽¹²⁾	123000 N ⁽¹²⁾	37000 N ⁽¹²⁾	NA	No	BSL
1031-07-8	Endosulfan Sulfate	2.1 J	2.1 J	ug/kg	03SS0901	1/10	0.56 - 0.72	2.1	NA	46900 N ⁽¹²⁾	123000 N ⁽¹²⁾	37000 N ⁽¹²⁾	NA	No	BSL
72-20-8	Endrin	0.62 J	0.62 J	ug/kg	03SS1001	1/10	0.56 - 0.72	0.62	NA	2350 N	6130 N	1800 N	NA	No	BSL
7421-93-4	Endrin Aldehyde	0.18 J	0.45 J	ug/kg	03SS0101	2/10	0.56 - 0.72	0.45	NA	2350 N ⁽¹³⁾	6130 N ⁽¹³⁾	1800 N ⁽¹³⁾	NA	No	BSL
58-89-9	gamma-BHC (Lindane)	0.45 J	1.2 J	ug/kg	03SS0301	5/10	0.29 - 0.32	1.2	NA	491 C	4400 C	440 C	NA	No	BSL
5103-74-2	gamma-Chlordane	0.098 J	14 J	ug/kg	03SS0901	6/10	0.28 - 0.36	14	NA	1820 C ⁽¹¹⁾	12300 C ⁽¹¹⁾	1600 C ⁽¹¹⁾	72000 C	No	BSL
1024-57-3	Heptachlor Epoxide	0.23 J	0.47 J	ug/kg	03SS0101	3/10	0.28 - 0.36	0.47	NA	70.2 C	629 C	53 C	4700 C	No	BSL
Herbicides															
88-85-7	Dinoseb	14 J	14 J	ug/kg	03SS1001	1/10	13 - 17	14	NA	7820 N	20400 N	6100 N	NA	No	BSL
Inorganics															
7429-90-5	Aluminum	2670	7300	mg/kg	03SS0701	10/10	-	7300	NA	7820 N	204000 N	7500 N ⁽¹⁰⁾	709000 N	No	BSL
7440-36-0	Antimony	1.2 J	1.2 J	mg/kg	03SS0901	1/10	0.99 - 1.2	1.2	NA	3.13 N	8.17 N	3.1 N	NA	No	BSL
7440-38-2	Arsenic	1.1	6	mg/kg	03SS0901	10/10	-	6	NA	0.426 C	3.82 C	0.39 C	769 C	Yes	ASL
7440-39-3	Barium	6.7	23.2	mg/kg	03SS0901	10/10	-	23.2	NA	548 N	1430 N	1500 N ⁽¹⁰⁾	70900 N	No	BSL
7440-43-9	Cadmium	0.91	0.91	mg/kg	03SS0901	1/10	0.2 - 0.25	0.91	NA	3.91 N	102 N	3.7 N	1840 C	No	BSL
7440-70-2	Calcium	497 J	4560 J	mg/kg	03SS0501	6/10	204 - 246	4560	NA	NA	NA	NA	NA	No	NUT
7440-47-3	Chromium	2.8 J	10.6 J	mg/kg	03SS0901	10/10	-	10.6	NA	227 C ⁽¹⁴⁾	381 C ⁽¹⁴⁾	30 C	276 C	No	BSL
7440-48-4	Cobalt	1.1	2.1	mg/kg	03SS1001D	3/10	0.99 - 1.2	2.1	NA	469 N	1230 N	140 N ⁽¹⁵⁾	1180 C	No	BSL
7440-50-8	Copper	1.3	15.2	mg/kg	03SS0901	5/10	0.99 - 1.2	15.2	NA	313 N	817 N	310 N	NA	No	BSL
7439-89-6	Iron	2560 J	12900 J	mg/kg	03SS0401	10/10	-	12900	NA	2350 N	61300 N	5500 N⁽⁶⁾	NA	Yes	ASL
7439-92-1	Lead	2.6 J	59.3 J	mg/kg	03SS0901	10/10	-	59.3	NA	400	1700	400	NA	No	BSL
7439-95-4	Magnesium	277 J	1080 J	mg/kg	03SS0901	2/10	197 - 246	1080	NA	NA	NA	NA	NA	No	NUT
7439-96-5	Manganese	1.9 J	44.2 J	mg/kg	03SS0901	10/10	-	44.2	NA	156 N	408 N	180 N	7090 N	No	BSL
7439-97-6	Mercury	0.014	0.08	mg/kg	03SS0701	5/10	0.013 - 0.015	0.08	NA	1 N	6.13 N	2.3 N	NA	No	BSL
7440-02-0	Nickel	1.4	8	mg/kg	03SS0901	7/10	1 - 1.2	8	NA	156 N	408 N	160 N	NA	No	BSL
7782-49-2	Selenium	0.68	0.68	mg/kg	03SS0401	1/10	0.61 - 0.74	0.68	NA	39.1 N	102 N	39 N	NA	No	BSL
7440-62-2	Vanadium	5.1	18.8	mg/kg	03SS0401	10/10	-	18.8	NA	54.8 N	143 N	7.8 N	NA	Yes	ASL
7440-66-6	Zinc	1.7 J	255 J	mg/kg	03SS0901	10/10	-	255	NA	2350 N	6130 N	2300 N	NA	No	BSL

**TABLE 6-1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE SOIL
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TRGs Unrestricted Value ⁽⁵⁾	MDEQ TRGs Restricted Value ⁽⁵⁾	USEPA Region IX PRGs Residential ⁽⁶⁾	USEPA SSLs Soil to Air ⁽⁷⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁸⁾
Miscellaneous Parameters															
57-12-5	Cyanide	0.14	0.14	mg/kg	03SS0601	1/10	0.13 - 0.17	0.14	NA	156 N ⁽¹⁶⁾	408 N ⁽¹⁶⁾	120 N ⁽¹⁶⁾	NA	No	BSL

Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
- 2 - Values presented are sample-specific quantitation limits.
- 3 - The maximum detected concentration is used for screening purposes.
- 4 - No background soil samples were collected
- 5 - Mississippi Department of Environmental Quality (MDEQ), Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites for Unrestricted and Restricted Land Use, February 2002. Noncarcinogenic values are divided by 10.
- 6 - USEPA Region IX Preliminary Remediation Goal (PRG). The noncarcinogenic values (denoted with a "N" flag) are the PRG divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag) (USEPA Region IX, October 2004, Updated December 28, 2004).
- 7 - EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm. Noncarcinogenic values are divided by 10.
- 8 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
- 9 - Pyrene is used as a surrogate for benzo(g,h,i)perylene.
- 10 - The toxicity criteria in the October 2004 PRG table is outdated. Value was updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table.
- 11 - Chlordane is used as a surrogate for alpha- and gamma-chlordane.
- 12 - Endosulfan is used as a surrogate for Endosulfan Sulfate and Endosulfan II.
- 13 - Endrin is used as a surrogate for Endrin Aldehyde.
- 14 - Values are for hexavalent chromium.
- 15 - One tenth of the noncarcinogenic PRG is less than the carcinogenic PRG, therefore the one tenth noncarcinogenic PRG is presented.
- 16 - Value is for free cyanide.

Definitions:

- ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
 C = Carcinogen
 COPC = Chemical Of Potential Concern
 J = Estimated value
 N = Noncarcinogen
 NA = Not Applicable/Not Available
 sat = soil saturation concentration

Rationale Codes:

- For selection as a COPC:
 ASL = Above Screening Level and site background.

- For elimination as a COPC:
 BSL = Below COPC Screening Level
 NUT = Essential nutrient
 NTX = No toxicity criteria

Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples

- 03SS0101
- 03SS0201
- 03SS0301
- 03SS0401
- 03SS0501
- 03SS0601
- 03SS0701
- 03SS0801
- 03SS0901
- 03SS1001
- 03SS1001D

The following chemicals were retained as COPCs for surface soil:

- Semivolatiles – benzo(a)pyrene, benzo(a)anthracene, benzo(a)pyrene equivalents, and benzo(b)fluoranthene).
- Inorganics – arsenic, iron, vanadium.

These constituents were identified as COPCs in surface soil because maximum concentrations exceeded one or more of the screening criteria. The maximum detected concentrations of benzo(a)pyrene, benzo(a)anthracene, calculated benzo(a)pyrene equivalents⁽¹⁾, benzo(b)fluoranthene, and iron exceeded USEPA Region 9 PRGs and MDEQ Tier 1 TRGs for unrestricted land use but did not exceed MDEQ Tier 1 TRGs for restricted land use. The maximum concentration of vanadium exceeded only the Region 9 risk-based screening level but was less than MDEQ Tier 1 TRGs for restricted and unrestricted land use. The maximum concentration of arsenic exceeded the USEPA Region 9 PRG, the MDEQ Tier 1 TRG for unrestricted land use, and the MDEQ Tier 1 TRG for restricted land use.

The concentrations of arsenic, iron, and vanadium are within naturally occurring background ranges found in United States soil (Dragun, 1998), and based on a comparison of site data to the available background data presented in the scientific literature (Pettry and Switzer, 2001), the concentrations of arsenic, iron, and vanadium detected in surface soil at Site 3 are likely naturally occurring.

Maximum surface soil concentrations were also compared to USEPA Generic SSLs for migration from soil to air (inhalation), when available. As shown in Table 6-1, the maximum concentrations of all constituents were less than the inhalation SSLs. Therefore, potential risks from inhalation of chemicals detected in surface soil are expected to be minimal, and this pathway is not evaluated further in the risk assessment.

Migration of Chemicals from Surface Soil to Groundwater

Maximum concentrations in surface soil were also compared to USEPA SSLs for protection of groundwater quality derived using a dilution/attenuation factor (DAF) of 1 see (Table 6-2).

¹ Seven PAHs are known to cause cancer in animals; the most potent carcinogen of these seven is benzo(a)pyrene. The toxicity of each of the other six PAHs is compared to that of benzo(a)pyrene and assigned a toxicity-equivalent factor. This factor describes how carcinogenic it is relative to benzo(a)pyrene. In calculating benzo(a)pyrene-equivalent concentrations, the concentration of each PAH is multiplied by its toxicity-equivalent factor. The resulting weighted concentrations are summed to calculate the benzo[a]pyrene-equivalent carcinogenic PAH value.

TABLE 6-2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - MIGRATION FROM SURFACE SOIL TO GROUNDWATER
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
Page 1 of 2

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	USEPA SSL Soil to Groundwater ⁽⁵⁾ DAF = 1	USEPA SSL Soil to Groundwater ⁽⁵⁾ DAF = 20	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁶⁾
Volatile Organic Compounds													
67-66-3	Chloroform	0.61 J	0.61 J	ug/kg	03SS0801	1/10	5 - 7.5	0.61	NA	29 MCL	590 MCL	No	BSL
Semivolatile Organic Compounds													
	BaP Equivalent	207.55	264.62	ug/kg	03SS0101	3/10	360 - 450	264.62	NA	410 MCL	8200 MCL	No	BSL
56-55-3	Benzo(a)anthracene	84 J	170 J	ug/kg	03SS0901	3/10	360 - 450	170	NA	160 MCL⁽¹²⁾	3200 MCL	Yes	ASL
50-32-8	Benzo(a)pyrene	170 J	210 J	ug/kg	03SS0101	3/10	360 - 450	210	NA	410 MCL	8200 MCL	No	BSL
205-99-2	Benzo(b)fluoranthene	270 J	360 J	ug/kg	03SS0101	3/10	360 - 450	360	NA	490 MCL ⁽⁷⁾	9800 MCL	No	BSL
191-24-2	Benzo(g,h,i)perylene	100 J	100 J	ug/kg	03SS0901	1/10	360 - 450	100	NA	NA	NA	No	NTX
207-08-9	Benzo(k)fluoranthene	200 J	240 J	ug/kg	03SS0101, 03SS0901	3/10	360 - 450	240	NA	490 MCL ⁽⁷⁾	9800 MCL	No	BSL
117-81-7	Bis(2-ethylhexyl)phthalate	52 J	280 J	ug/kg	03SS0901	6/10	370 - 450	280	NA	180000 MCL	3600000 MCL	No	BSL
105-60-2	Caprolactam	170 J	260 J	ug/kg	03SS0301	2/10	360 - 430	260	NA	3900 N	78000 N	No	BSL
218-01-9	Chrysene	150 J	230 J	ug/kg	03SS0901	3/10	360 - 450	230	NA	160 MCL	3200 MCL	Yes	ASL
206-44-0	Fluoranthene	73 J	160 J	ug/kg	03SS0101	3/10	360 - 450	160	NA	310000 N	6300000 N	No	BSL
129-00-0	Pyrene	140 J	370 J	ug/kg	03SS0101	3/10	360 - 450	370	NA	230000 N	4600000 N	No	BSL
Pesticides/PCBs													
72-54-8	4,4'-DDD	0.73 J	3.3 J	ug/kg	03SS1001	4/10	0.56 - 0.72	3.3	NA	710 C	14000 C	No	BSL
72-55-9	4,4'-DDE	0.73 J	4.9	ug/kg	03SS0101	4/10	0.56 - 0.72	4.9	NA	2200 C	45000 C	No	BSL
50-29-3	4,4'-DDT	0.29 J	17 J	ug/kg	03SS1001	5/10	0.58 - 0.72	17	NA	1300 C	26000 C	No	BSL
309-00-2	Aldrin	0.31 J	0.66 J	ug/kg	03SS1001	2/10	0.28 - 0.36	0.66	NA	25 C	490 C	No	BSL
319-84-6	alpha-BHC	0.22 J	0.68 J	ug/kg	03SS0701	4/10	0.28 - 0.36	0.68	NA	0.036 C	0.72 C	Yes	ASL
5103-71-9	alpha-Chlordane	0.14 J	26 J	ug/kg	03SS0901	7/10	0.29 - 0.36	26	NA	480 MCL ⁽⁸⁾	9600 MCL ⁽⁸⁾	No	BSL
319-85-7	beta-BHC	0.11 J	0.19 J	ug/kg	03SS0201	3/10	0.29 - 0.36	0.19	NA	0.13 C	2.6 C	Yes	ASL
60-57-1	Dieldrin	0.17 J	3.7 J	ug/kg	03SS0701	6/10	0.58 - 0.72	3.7	NA	0.23 C	4.6 C	Yes	ASL
33213-65-9	Endosulfan II	0.28 J	1.5 J	ug/kg	03SS0901	4/10	0.56 - 0.72	1.5	NA	980 N ⁽⁹⁾	20000 N ⁽⁹⁾	No	BSL
1031-07-8	Endosulfan Sulfate	2.1 J	2.1 J	ug/kg	03SS0901	1/10	0.56 - 0.72	2.1	NA	980 N ⁽⁹⁾	20000 N ⁽⁹⁾	No	BSL
72-20-8	Endrin	0.62 J	0.62 J	ug/kg	03SS1001	1/10	0.56 - 0.72	0.62	NA	50 MCL	990 MCL	No	BSL
7421-93-4	Endrin Aldehyde	0.18 J	0.45 J	ug/kg	03SS0101	2/10	0.56 - 0.72	0.45	NA	50 MCL ⁽¹⁰⁾	990 MCL ⁽¹⁰⁾	No	BSL
58-89-9	gamma-BHC (Lindane)	0.45 J	1.2 J	ug/kg	03SS0301	5/10	0.29 - 0.32	1.2	NA	0.47 MCL	9.4 MCL	Yes	ASL
5103-74-2	gamma-Chlordane	0.098 J	14 J	ug/kg	03SS0901	6/10	0.28 - 0.36	14	NA	480 MCL ⁽⁸⁾	9600 MCL ⁽⁸⁾	No	BSL
1024-57-3	Heptachlor Epoxide	0.23 J	0.47 J	ug/kg	03SS0101	3/10	0.28 - 0.36	0.47	NA	33 MCL	670 MCL	No	BSL
Herbicides													
88-85-7	Dinoseb	14 J	14 J	ug/kg	03SS1001	1/10	13 - 17	14	NA	19 MCL	370 MCL	No	BSL
Inorganics													
7429-90-5	Aluminum	2670	7300	mg/kg	03SS0701	10/10	-	7300	NA	8.3 N	170 0	Yes	ASL
7440-36-0	Antimony	1.2 J	1.2 J	mg/kg	03SS0901	1/10	0.99 - 1.2	1.2	NA	0.27 MCL	5.4 MCL	Yes	ASL
7440-38-2	Arsenic	1.1	6	mg/kg	03SS0901	10/10	-	6	NA	0.29 MCL	5.8 MCL	Yes	ASL
7440-39-3	Barium	6.7	23.2	mg/kg	03SS0901	10/10	-	23.2	NA	82 MCL	1600 MCL	No	BSL
7440-43-9	Cadmium	0.91	0.91	mg/kg	03SS0901	1/10	0.2 - 0.25	0.91	NA	0.38 MCL	7.5 MCL	Yes	ASL
7440-70-2	Calcium	497 J	4560 J	mg/kg	03SS0501	6/10	204 - 246	4560	NA	NA	NA	No	NUT
7440-47-3	Chromium	2.8 J	10.6 J	mg/kg	03SS0901	10/10	-	10.6	NA	2.1 N	42 N	Yes	ASL
7440-48-4	Cobalt	1.1	2.1	mg/kg	03SS1001D	3/10	0.99 - 1.2	2.1	NA	0.17 N	3.3 N	Yes	ASL
7440-50-8	Copper	1.3	15.2	mg/kg	03SS0901	5/10	0.99 - 1.2	15.2	NA	560 MCL	11000 MCL	No	BSL
7439-89-6	Iron	2560 J	12900 J	mg/kg	03SS0401	10/10	-	12900	NA	NA	NA	No	NTX
7439-92-1	Lead	2.6 J	59.3 J	mg/kg	03SS0901	10/10	-	59.3	NA	NA	NA	No	NTX
7439-95-4	Magnesium	277 J	1080 J	mg/kg	03SS0901	2/10	197 - 246	1080	NA	NA	NA	No	NUT

**TABLE 6-2
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - MIGRATION FROM SURFACE SOIL TO GROUNDWATER
SITE 3 REMEDIAL INVESTIGATION REPORT
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CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	USEPA SSL Soil to Groundwater ⁽⁵⁾ DAF = 1	USEPA SSL Soil to Groundwater ⁽⁵⁾ DAF = 20	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁶⁾
7439-96-5	Manganese	1.9 J	44.2 J	mg/kg	03SS0901	10/10	-	44.2	NA	110 N	2200 N	No	BSL
7439-97-6	Mercury	0.014	0.08	mg/kg	03SS0701	5/10	0.013 - 0.015	0.08	NA	0.1 MCL	2.1 MCL	No	BSL
7440-02-0	Nickel	1.4	8	mg/kg	03SS0901	7/10	1 - 1.2	8	NA	14 N	280 N	No	BSL
7782-49-2	Selenium	0.68	0.68	mg/kg	03SS0401	1/10	0.61 - 0.74	0.68	NA	0.26 MCL	5.2 MCL	Yes	ASL
7440-62-2	Vanadium	5.1	18.8	mg/kg	03SS0401	10/10	-	18.8	NA	260 N	5100 N	No	BSL
7440-66-6	Zinc	1.7 J	255 J	mg/kg	03SS0901	10/10	-	255	NA	680 N	14000 N	No	BSL
Miscellaneous Parameters													
57-12-5	Cyanide	0.14	0.14	mg/kg	03SS0601	1/10	0.13 - 0.17	0.14	NA	2 MCL	40 MCL	No	BSL

Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
- 2 - Values presented are sample-specific quantitation limits.
- 3 - The maximum detected concentration is used for screening purposes.
- 4 - No background samples were collected for soil.
- 5 - EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm.
- 6 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
- 7 - SSL is based on the MCL for benzo(a)pyrene.
- 8 - Chlordane is used as a surrogate for alpha- and gamma-chlordane.
- 9 - Endosulfan is used as a surrogate for Endosulfan II and Endosulfan Sulfate.
- 10 - Endrin is used as a surrogate for Endrin Aldehyde.

Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples

- 03SS0101
- 03SS0201
- 03SS0301
- 03SS0401
- 03SS0501
- 03SS0601
- 03SS0701
- 03SS0801
- 03SS0901
- 03SS1001
- 03SS1001D

Definitions:

- ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
- C = Carcinogen
- COPC = Chemical Of Potential Concern
- J = Estimated value
- MCL = Maximum contaminant level
- N = Noncarcinogen
- NA = Not Applicable/Not Available

Rationale Codes:

For selection as a COPC:
ASL = Above Screening Level and site background.

For elimination as a COPC:
BSL = Below COPC Screening Level
NUT = Essential nutrient
NTX = No toxicity criteria

The following chemicals were detected in surface soil at maximum concentrations exceeding the COPC screening levels for contaminant migration from soil to groundwater:

- Semivolatiles – benzo(a)anthracene and chrysene
- Pesticides – alpha-BHC, beta-BHC, dieldrin, and gamma-BHC (Lindane)
- Inorganics – aluminum, antimony, cadmium, chromium, cobalt, and selenium

These exceedances of SSLs may indicate the potential for chemicals in soil to leach to groundwater and impact water quality. However, of the chemicals detected at concentrations exceeding the migration-to-groundwater SSLs, only aluminum, cobalt, selenium, and chromium were detected in groundwater samples collected at the site. Benzo(a)anthracene was only detected in 3 of 10 surface soil samples. The soil data for organic chemicals suggest that surface soil is not a significant residual contaminant source for groundwater contamination at Site 3. It is more likely that the liquid wastes deposited directly in the trenches are the source of the groundwater (and surface water and sediment) contamination at the site. Further evidence of this is the fact that most of the CVOCs (i.e., 1,2,4-trichlorobenzene [TCB], 1,2-DCA, and TCE) detected in groundwater samples were not detected in any of the surface soil samples.

Most of the metals exceeding the migration from soil to groundwater SSLs were detected in groundwater samples. However, antimony was not detected in groundwater samples, and the maximum concentration of chromium in soil was within of the range of soil background levels reported in the continental United States (Dragun, 1988).

In addition, the SSLs with DAFs of 1 are very conservative because a DAF of 1 assumes that no dilution or attenuation occurs as a chemical migrates from soil to groundwater. USEPA in its Soil Screening Guidance (USEPA, 1996b) recommends that a DAF of 20 be used as the default DAF and states that “A DAF of 20 is protective for sources up to 0.5 acre in size.” Further analyses presented in the SSL Guidance indicate that it can be protective of larger sources as well. If SSLs with DAFs of 20 were used in the comparisons presented in Table 6-2, only the maximum concentrations of aluminum and arsenic would exceed their respective SSLs.

6.3.3 COPC Selection for Subsurface Soil

This section presents the results of the COPC selection process for subsurface soil. The contamination at Site 3 originated from solid and liquid wastes that were disposed in trenches and burned. The liquid wastes consisted of fuels, oils, solvents, paints, and paint thinners. Solid wastes, such as infrastructure

debris, were also disposed at the site. The COPC screening process for subsurface soil and the results of the screening are presented in Table 6-3. The subsurface soil data set consists of 10 samples collected from 2 to 8 feet bls during the field investigation conducted in 2006 and 2007. The following chemicals were retained as COPCs for subsurface soil:

- Inorganics – arsenic, iron, and vanadium

These constituents were identified as COPCs in subsurface soil because maximum concentrations exceeded one or more of the human health risk screening levels for residential land use (i.e., USEPA Region 9 risk-based screening levels for residential soil and/or MDEQ Tier 1 TRGs for restricted and unrestricted land use). The maximum detected concentrations of arsenic and iron exceeded USEPA Region 9 PRGs and MDEQ Tier 1 TRGs for unrestricted land use but did not exceed MDEQ Tier 1 TRGs for restricted land use. The maximum concentration of vanadium exceeded the Region 9 risk-based screening level but was less than the MDEQ Tier 1 TRGs for restricted and unrestricted land use. No site-specific background data are available for NCBC Gulfport. Therefore, a background screen was used only for arsenic in the COPC selection process. However, the concentrations of arsenic, iron, and vanadium are within naturally occurring background ranges found in United States soil (Dragun, 1998). In addition, the maximum concentration of arsenic (2.4 mg/kg) is within the range of background concentrations determined in a study of arsenic in Mississippi (Pettry and Switzer, 2001). Based on a comparison of site data to the available background data presented in the scientific literature, the concentrations of arsenic, iron, and vanadium detected in subsurface soil at Site 3 are naturally occurring.

Maximum concentrations were also compared to USEPA Generic SSLs for migration from soil to air (inhalation), when available. As shown in Table 6-3, the maximum concentrations of all constituents were less than the inhalation SSLs. Therefore, potential risks from inhalation of chemicals detected in subsurface soil are expected to be minimal, and this pathway is not evaluated further in the risk assessment.

Migration of Chemicals from Subsurface Soil to Groundwater

Maximum concentrations in subsurface soil were also compared to USEPA SSLs for the protection of groundwater developed using a DAF of 1 (USEPA, 1996b). The following chemicals were detected in subsurface soil at maximum concentrations exceeding the COPC screening levels for contaminant migration from soil to groundwater:

- Vinyl chloride
- Pesticides – beta-BHC and gamma-BHC (Lindane)
- Inorganics – aluminum, arsenic, barium, and chromium

TABLE 6-3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SUBSURFACE SOIL
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
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CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TRGs Unrestricted Value ⁽⁵⁾	MDEQ TRGs Restricted Value ⁽⁵⁾	USEPA Region IX PRGs Residential ⁽⁶⁾	USEPA SSLs Soil to Air ⁽⁷⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁸⁾
Volatile Organic Compounds															
78-93-3	2-Butanone	1.9 J	1.9 J	ug/kg	03SB0701	1/10	1.3 - 1.6	1.9	NA	8450 N	8450 N	2200000 N	24000000 sat	No	BSL
108-10-1	4-Methyl-2-Pentanone	1.1 J	1.1 J	ug/kg	03SB0701	1/10	0.54 - 0.66	1.1	NA	626000 N	16300000 N	530000 N	2700000 sat	No	BSL
75-15-0	Carbon Disulfide	6	6	ug/kg	03SB0601	1/10	1.2 - 1.5	6	NA	797 N	797 N	36000 N	720000 sat	No	BSL
156-59-2	cis-1,2-Dichloroethene	3.2 J	3.2 J	ug/kg	03SB0601	1/10	1.1 - 1.4	3.2	NA	78200 N	1210000 sat	4300 N	NA	No	BSL
75-01-4	Vinyl Chloride	3.7 J	3.7 J	ug/kg	03SB0301	1/10	1 - 1.3	3.7	NA	426 C	939 C	79 C	280 C	No	BSL
Semivolatile Organic Compounds															
117-81-7	Bis(2-ethylhexyl)phthalate	480	480	ug/kg	03SB0701	1/10	41 - 45	480	NA	45600 C	409000 C	35000 C	NA	No	BSL
218-01-9	Chrysene	46 J	46 J	ug/kg	03SB0201	1/10	35 - 38	46	NA	87500 C	784000 C	15000 C ⁽⁹⁾	NA	No	BSL
Pesticides/PCBs															
72-54-8	4,4'-DDD	1	1.2	ug/kg	03SB0301	2/10	0.15 - 0.16	1.2	NA	2660 C	23800 C	2400 C	NA	No	BSL
72-55-9	4,4'-DDE	0.34 J	0.53 J	ug/kg	03SB0301	2/10	0.15 - 0.16	0.53	NA	1880 C	16800 C	1700 C	NA	No	BSL
50-29-3	4,4'-DDT	0.23 J	1.7 J	ug/kg	03SB0101	4/10	0.15 - 0.16	1.7	NA	1880 C	16800 C	1700 C	750000 C	No	BSL
319-85-7	beta-BHC	0.32 J	2.1	ug/kg	03SB1001	4/10	0.098 - 0.11	2.1	NA	355 C	3180 C	320 C	6000 C	No	BSL
58-89-9	gamma-BHC (Lindane)	0.41	0.6 J	ug/kg	03SB0301	2/10	0.097 - 0.11	0.6	NA	491 C	4400 C	440 C	NA	No	BSL
5103-74-2	gamma-Chlordane	0.2 J	0.49	ug/kg	03SB0101	4/10	0.098 - 0.11	0.49	NA	1820 C ⁽¹⁰⁾	12300 C ⁽¹⁰⁾	1600 C ⁽¹⁰⁾	72000 C	No	BSL
76-44-8	Heptachlor	0.55	0.55	ug/kg	03SB1001	1/10	0.097 - 0.11	0.55	NA	127 C	195 C	110 C	4100 C	No	BSL
1024-57-3	Heptachlor Epoxide	0.23 J	0.78	ug/kg	03SB1001	3/10	0.098 - 0.11	0.78	NA	70.2 C	629 C	53 C	4700 C	No	BSL
Inorganics															
7429-90-5	Aluminum	443	7280	mg/kg	03SB0801	10/10	-	7280	NA	7820 N	204000 N	7500 N ⁽⁹⁾	709000 N	No	BSL
7440-38-2	Arsenic	0.79	2.4	mg/kg	03SB0401	2/10	0.61 - 0.75	2.4	NA	0.426 C	3.82 C	0.39 C	769 C	Yes	ASL
7440-39-3	Barium	2.5	24.1	mg/kg	03SB0401	10/10	-	24.1	NA	548 N	1430 N	1500 N ⁽⁹⁾	70900 N	No	BSL
7440-70-2	Calcium	260 J	378	mg/kg	03SB0301	2/10	204 - 251	378	NA	NA	NA	NA	NA	No	NUT
7440-47-3	Chromium	1	7.5	mg/kg	03SB0401	10/10	-	7.5	NA	227 C ⁽¹¹⁾	381 C ⁽¹¹⁾	30 C	276 C	No	BSL
7440-50-8	Copper	1.3	1.3	mg/kg	03SB0401	1/10	1 - 1.3	1.3	NA	313 N	817 N	310 N	NA	No	BSL
7439-89-6	Iron	107	6640	mg/kg	03SB0401	10/10	-	6640	NA	2350 N	61300 N	5500 N⁽⁶⁾	NA	Yes	ASL
7439-92-1	Lead	2.2	5.9	mg/kg	03SB0301	5/10	1 - 2.1	5.9	NA	400	1700 C	400	NA	No	BSL
7439-95-4	Magnesium	238	238	mg/kg	03SB0401	1/10	204 - 251	238	NA	NA	NA	NA	NA	No	NUT
7439-96-5	Manganese	0.74	4.4	mg/kg	03SB0401	10/10	-	4.4	NA	156 N	408 N	180 N	7090 N	No	BSL
7439-97-6	Mercury	0.024	0.024	mg/kg	03SB0301	1/10	0.013 - 0.017	0.024	NA	1 N	6.13 N	2.3 N	NA	No	BSL
7440-02-0	Nickel	1.3	1.3	mg/kg	03SB0801	1/10	1 - 1.3	1.3	NA	156 N	408 N	160 N	NA	No	BSL
7440-62-2	Vanadium	2	13.8	mg/kg	03SB0401	7/10	1 - 1.2	13.8	NA	54.8 N	143 N	7.8 N	NA	Yes	ASL
7440-66-6	Zinc	1.2	7.7	mg/kg	03SB0301	6/10	1 - 1.3	7.7	NA	2350 N	6130 N	2300 N	NA	No	BSL

**TABLE 6-3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SUBSURFACE SOIL
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CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TRGs Unrestricted Value ⁽⁵⁾	MDEQ TRGs Restricted Value ⁽⁵⁾	USEPA Region IX PRGs Residential ⁽⁶⁾	USEPA SSLs Soil to Air ⁽⁷⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁸⁾
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Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
- 2 - Values presented are sample-specific quantitation limits.
- 3 - The maximum detected concentration is used for screening purposes.
- 4 - No background soil samples were collected
- 5 - Mississippi Department of Environmental Quality (MDEQ), Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites for Unrestricted and Restricted Land Use, February 2002. Noncarcinogenic values are divided by 10.
- 6 - USEPA Region IX Preliminary Remediation Goal (PRG). The noncarcinogenic values (denoted with a "N" flag) are the PRG divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag) (USEPA Region IX, October 2004, Updated December 28, 2004).
- 7 - EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm. Noncarcinogenic values are divided by 10.
- 8 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
- 9 - The toxicity criteria in the October 2004 PRG table is outdated. Value was updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table.
- 10 - Chlordane is used as a surrogate for gamma-chlordane.
- 11 - Values are for hexavalent chromium.

Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples

- 03SB0101
- 03SB0201
- 03SB0301
- 03SB0401
- 03SB0501
- 03SB0601
- 03SB0701
- 03SB0801
- 03SB0901
- 03SB0901-D
- 03SB1001

Definitions:

- ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
- C = Carcinogen
- COPC = Chemical Of Potential Concern
- J = Estimated value
- N = Noncarcinogen
- NA = Not Applicable/Not Available
- sat = soil saturation concentration

Rationale Codes:

- For selection as a COPC:
ASL = Above Screening Level and site background.
- For elimination as a COPC:
BSL = Below COPC Screening Level
NUT = Essential nutrient
NTX = No toxicity criteria

These exceedances of the SSLs may indicate the potential for chemicals in soil to leach to groundwater and impact water quality. However, of the organic chemicals that exceeded the migration-to-groundwater SSLs, only vinyl chloride was detected in groundwater samples collected at the site. Vinyl chloride was only detected in 1 of 10 subsurface soil samples, beta-BHC was detected in 4 of 10 subsurface soil samples, and Lindane was detected in 2 of 10 subsurface soil samples. The soil data for organic chemicals suggest that subsurface soil is not a significant residual contaminant source for groundwater contamination at Site 3. It is more likely that the liquid wastes deposited directly in the trenches are the source of the groundwater (and surface water and sediment) contamination at the site. Further evidence of this is the fact that most of the CVOCs (i.e., 1,2,4-TCB; 1,2-DCA; and TCE) detected in groundwater samples were not detected in any of the subsurface soil samples.

Most of the metals exceeding the migration from soil to groundwater SSLs were detected in groundwater samples. However, barium was not detected in any groundwater samples at concentrations exceeding screening criteria, and the maximum concentrations of barium and chromium in soil were within the range of soil background levels reported in the continental United States (Dragun, 1998). In addition, the maximum groundwater concentration of barium was less than the USEPA MCL, MDEQ TRGs, and Region 9 PRGs.

In addition, the SSLs with DAFs of 1 are very conservative because a DAF of 1 assumes that no dilution or attenuation occurs as a chemical migrates from soil to groundwater. USEPA in its Soil Screening Guidance (USEPA, 1996b) recommends that a DAF of 20 be used as the default DAF and states that “A DAF of 20 is protective for sources up to 0.5 acre in size”. Further analyses presented in the SSL Guidance indicate that it can be protective of larger sources as well. If SSLs with DAFs of 20 were used in the comparisons presented in Table 6-4, only the maximum concentration of aluminum would exceed its SSL.

6.3.4 COPC Selection for Groundwater

A comparison of maximum detected groundwater concentrations to screening levels based on USEPA Region 9 PRGs for ingestion of tap water, MDEQ TRGs, and USEPA MCLs is presented in Table 6-5. The following chemicals were retained as COPCs for groundwater:

- Volatiles – 1,2,4-TCB; 1,2-DCA; cis-1,2-DCE; trans-1,2-DCE; benzene; TCE; vinyl chloride; and methylene chloride.
- Inorganics – aluminum, arsenic, chromium, iron, lead, manganese, and vanadium.

**TABLE 6-4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - MIGRATION FROM SUBSURFACE SOIL TO GROUNDWATER
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CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	USEPA SSL Soil to Groundwater ⁽⁵⁾ DAE = 1	USEPA SSL Soil to Groundwater ⁽⁵⁾ DAE = 20	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁶⁾
Volatile Organic Compounds													
78-93-3	2-Butanone	1.9 J	1.9 J	ug/kg	03SB0701	1/10	1.3 - 1.6	1.9	NA	4400 N	89000 N	No	BSL
108-10-1	4-Methyl-2-Pentanone	1.1 J	1.1 J	ug/kg	03SB0701	1/10	0.54 - 0.66	1.1	NA	620 N	12000 N	No	BSL
75-15-0	Carbon Disulfide	6	6	ug/kg	03SB0601	1/10	1.2 - 1.5	6	NA	1500 N	29000 N	No	BSL
156-59-2	cis-1,2-Dichloroethene	3.2 J	3.2 J	ug/kg	03SB0601	1/10	1.1 - 1.4	3.2	NA	20 MCL	400 MCL	No	BSL
75-01-4	Vinyl Chloride	3.7 J	3.7 J	ug/kg	03SB0301	1/10	1 - 1.3	3.7	NA	0.67 MCL	13 MCL	Yes	ASL
Semivolatile Organic Compounds													
117-81-7	Bis(2-ethylhexyl)phthalate	480	480	ug/kg	03SB0701	1/10	41 - 45	480	NA	180000 MCL	3600000 MCL	No	BSL
218-01-9	Chrysene	46 J	46 J	ug/kg	03SB0201	1/10	35 - 38	46	NA	160 MCL	3200 MCL	No	BSL
Pesticides/PCBs													
72-54-8	4,4'-DDD	1	1.2	ug/kg	03SB0301	2/10	0.15 - 0.16	1.2	NA	710 C	14000 C	No	BSL
72-55-9	4,4'-DDE	0.34 J	0.53 J	ug/kg	03SB0301	2/10	0.15 - 0.16	0.53	NA	2200 C	45000 C	No	BSL
50-29-3	4,4'-DDT	0.23 J	1.7 J	ug/kg	03SB0101	4/10	0.15 - 0.16	1.7	NA	1300 C	26000 C	No	BSL
319-85-7	beta-BHC	0.32 J	2.1	ug/kg	03SB1001	4/10	0.098 - 0.11	2.1	NA	0.13 C	2.6 C	Yes	ASL
58-89-9	gamma-BHC (Lindane)	0.41	0.6 J	ug/kg	03SB0301	2/10	0.097 - 0.11	0.6	NA	0.47 MCL	9.4 MCL	Yes	ASL
5103-74-2	gamma-Chlordane	0.2 J	0.49	ug/kg	03SB0101	4/10	0.098 - 0.11	0.49	NA	480 MCL ⁽⁷⁾	9600 MCL ⁽⁷⁾	No	BSL
76-44-8	Heptachlor	0.55	0.55	ug/kg	03SB1001	1/10	0.097 - 0.11	0.55	NA	1100 MCL	23000 MCL	No	BSL
1024-57-3	Heptachlor Epoxide	0.23 J	0.78	ug/kg	03SB1001	3/10	0.098 - 0.11	0.78	NA	33 MCL	670 MCL	No	BSL
Inorganics													
7429-90-5	Aluminum	443	7280	mg/kg	03SB0801	10/10	-	7280	NA	8.3 N	170 N	Yes	ASL
7440-38-2	Arsenic	0.79	2.4	mg/kg	03SB0401	2/10	0.61 - 0.75	2.4	NA	0.29 MCL	5.8 MCL	Yes	ASL
7440-39-3	Barium	2.5	24.1	mg/kg	03SB0401	10/10	-	24.1	NA	8.2 MCL	1600 MCL	Yes	ASL
7440-70-2	Calcium	260 J	378	mg/kg	03SB0301	2/10	204 - 251	378	NA	NA	NA	No	NUT
7440-47-3	Chromium	1	7.5	mg/kg	03SB0401	10/10	-	7.5	NA	2.1 N	42 N	Yes	ASL
7440-50-8	Copper	1.3	1.3	mg/kg	03SB0401	1/10	1 - 1.3	1.3	NA	560 MCL	11000 MCL	No	BSL
7439-89-6	Iron	107	6640	mg/kg	03SB0401	10/10	-	6640	NA	NA	NA	No	NTX
7439-92-1	Lead	2.2	5.9	mg/kg	03SB0301	5/10	1 - 2.1	5.9	NA	NA	NA	No	NTX
7439-95-4	Magnesium	238	238	mg/kg	03SB0401	1/10	204 - 251	238	NA	NA	NA	No	NUT
7439-96-5	Manganese	0.74	4.4	mg/kg	03SB0401	10/10	-	4.4	NA	110 N	2200 N	No	BSL
7439-97-6	Mercury	0.024	0.024	mg/kg	03SB0301	1/10	0.013 - 0.017	0.024	NA	0.1 MCL	2.1 MCL	No	BSL
7440-02-0	Nickel	1.3	1.3	mg/kg	03SB0801	1/10	1 - 1.3	1.3	NA	14 N	280 N	No	BSL
7440-62-2	Vanadium	2	13.8	mg/kg	03SB0401	7/10	1 - 1.2	13.8	NA	260 N	5100 N	No	BSL
7440-66-6	Zinc	1.2	7.7	mg/kg	03SB0301	6/10	1 - 1.3	7.7	NA	680 N	14000 N	No	BSL

**TABLE 6-4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - MIGRATION FROM SUBSURFACE SOIL TO GROUNDWATER
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
PAGE 2 OF 2**

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondelects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	USEPA SSL Soil to Groundwater ⁽⁵⁾ DAE = 1	USEPA SSL Soil to Groundwater ⁽⁵⁾ DAE = 20	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁶⁾
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Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
 - 2 - Values presented are sample-specific quantitation limits.
 - 3 - The maximum detected concentration is used for screening purposes.
 - 4 - No background samples were collected for soil.
 - 5 - EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm.
 - 6 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
 - 7 - Chlordane is used as a surrogate for gamma-chlordane.
- Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Definitions:

- ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
- C = Carcinogen
- COPC = Chemical Of Potential Concern
- J = Estimated value
- MCL = Maximum contaminant level
- N = Noncarcinogen
- NA = Not Applicable/Not Available

Associated Samples

- 03SB0101
- 03SB0201
- 03SB0301
- 03SB0401
- 03SB0501
- 03SB0601
- 03SB0701
- 03SB0801
- 03SB0901
- 03SB0901-D
- 03SB1001

Rationale Codes:

- For selection as a COPC:
ASL = Above Screening Level and site background.
- For elimination as a COPC:
BSL = Below COPC Screening Level
NUT = Essential nutrient
NTX = No toxicity criteria

**TABLE 6-5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH GROUNDWATER
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
PAGE 1 OF 2**

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TRGs ⁽⁵⁾	USEPA Region IX PRG Tap Water ⁽⁶⁾	USEPA MCL ⁽⁷⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁸⁾
Volatile Organic Compounds														
75-35-4	1,1-Dichloroethene	0.7 J	2.2	ug/L	03GP1803	2/105	0.13 - 10	2.2	NA	7 MCL	34 N	7	No	BSL
120-82-1	1,2,4-Trichlorobenzene	1.2	1.2	ug/L	03GP0201	1/95	0.14 - 10	1.2	NA	70 MCL	0.72 N	70	Yes	ASL
107-06-2	1,2-Dichloroethane	1.4	1.6	ug/L	03GP0201, 03GP0202	3/105	0.13 - 10	1.6	NA	5 MCL	0.12 C	5	Yes	ASL
67-64-1	Acetone	13.9	13.9	ug/L	GPT-03-16GW-001	1/105	1.1 - 1000	13.9	NA	60.8 N	550 N	NA	No	BSL
71-43-2	Benzene	0.14 J	12	ug/L	03GP0301	10/105	0.11 - 10	12	NA	5 MCL	0.35 C	5	Yes	ASL
108-90-7	Chlorobenzene	1.1	1.1	ug/L	03GP1103, 03GP1803	2/105	0.1 - 10	1.1	NA	100 MCL	9 N ⁽⁹⁾	100	No	BSL
74-87-3	Chloromethane	10 J	10 J	ug/L	GPT-03-26GW-001	1/105	0.28 - 10	10	NA	1.43 C	16 N	NA	No	ASL
156-59-2	cis-1,2-Dichloroethene	0.87 J	880	ug/L	GPT-03-23GW-001	40/105	0.14 - 5	880	NA	70 MCL	6.1 N	70	Yes	ASL
110-82-7	Cyclohexane	1 J	1 J	ug/L	GPT-03-26GW-001	1/14	0.12 - 1.2	1	NA	NA	1000 N	NA	No	BSL
108-87-2	Methyl Cyclohexane	2.1 J	2.2	ug/L	GPT-03-26GW-001	2/14	0.12 - 1.2	2.2	NA	NA	520 N	NA	No	BSL
75-09-2	Methylene Chloride	12 J	14 J	ug/L	GPT-03-23GW-001	2/105	0.23 - 10	14	NA	5 MCL	4.3 C	5	Yes	ASL
156-60-5	trans-1,2-Dichloroethene	0.16 J	87.4	ug/L	03GP0202	18/105	0.15 - 10	87.4	NA	100 MCL	11 N ⁽⁵⁾	100	Yes	ASL
79-01-6	Trichloroethene	0.3 J	300	ug/L	GPT-03-21GW-001	22/105	0.23 - 10	300	NA	5 MCL	0.028 C	5	Yes	ASL
75-01-4	Vinyl Chloride	0.34 J	150	ug/L	03GP0301	31/105	0.19 - 10	150	NA	2 MCL	0.02 C	2	Yes	ASL
Semivolatile Organic Compounds														
121-14-2	2,4-Dinitrotoluene	0.63 J	0.63 J	ug/L	GPT-03-10GW-001	1/24	0.46 - 5	0.63	NA	7.3 N	7.3 N	NA	No	BSL
105-60-2	Caprolactam	0.47 J	0.47 J	ug/L	GPT-03-20GW-001	1/24	0.34 - 5	0.47	NA	1830 N	1800 N	NA	No	BSL
Inorganics														
7429-90-5	Aluminum	59.1 J	58900	ug/L	GPT-03-17GW-001	23/24	50 - 50	58900	NA	3650 N	3600 N	NA	Yes	ASL
7440-38-2	Arsenic	10.6	287	ug/L	GPT-03-11GW-001	10/24	3 - 10	287	NA	50 MCL	0.045 C	10	Yes	ASL
7440-39-3	Barium	28	378	ug/L	GPT-03-31GW-001-D	24/24	- - -	378	NA	2000 MCL	730 N ⁽⁹⁾	2000	No	BSL
7440-41-7	Beryllium	1.1	2.1	ug/L	GPT-03-17GW-001	3/24	1 - 1	2.1	NA	4 MCL	7.3 N	4	No	BSL
7440-70-2	Calcium	2610	88400	ug/L	GPT-03-16GW-001	24/24	- - -	88400	NA	NA	NA	NA	No	NUT
15723-28-1	Chromium	2.2	53.3	ug/L	GPT-03-17GW-001	13/24	2 - 2	53.3	NA	100	11 N	100	Yes	ASL
7440-48-4	Cobalt	5.2	5.2	ug/L	GPT-03-08GW-001	1/24	5 - 5	5.2	NA	219 N	73 N	NA	No	BSL
7440-50-8	Copper	13.7	13.7	ug/L	GPT-03-17GW-001	1/24	5 - 5	13.7	NA	1300 MCL	150 N	1300	No	BSL
7439-89-6	Iron	2660	33500	ug/L	GPT-03-26GW-001	24/24	- - -	33500	NA	1100 N	2600 N ⁽⁵⁾	NA	Yes	ASL
7439-92-1	Lead	1.6	19.4	ug/L	GPT-03-17GW-001	8/24	1.5 - 1.5	19.4	NA	15 MCL	NA	15	Yes	ASL
7439-95-4	Magnesium	1230	8510	ug/L	GPT-03-16GW-001	24/24	- - -	8510	NA	NA	NA	NA	No	NUT
7439-96-5	Manganese	31.8	235	ug/L	GPT-03-31GW-001-D	24/24	- - -	235	NA	73 N	88 N	NA	Yes	ASL
7439-97-6	Mercury	0.18 J	0.18 J	ug/L	GPT-03-17GW-001	1/24	0.08 - 0.089	0.18	NA	2 MCL	1.1 N	2	No	BSL
7440-02-0	Nickel	5.4	18.9	ug/L	GPT-03-17GW-001	5/24	5 - 5	18.9	NA	73 N	73 N	NA	No	BSL
7440-09-7	Potassium	1250	5450	ug/L	GPT-03-31GW-001-D	21/24	1000 - 1000	5450	NA	NA	NA	NA	No	NUT
7782-49-2	Selenium	8.2	8.2	ug/L	GPT-03-17GW-001	1/24	3 - 3	8.2	NA	50 MCL	18 N	50	No	BSL
7440-23-5	Sodium	5350	63200	ug/L	GPT-03-22GW-001	24/24	- - -	63200	NA	NA	NA	NA	No	NUT
7440-28-0	Thallium	3.7	3.7	ug/L	GPT-03-31GW-001	1/24	3 - 3.3	3.7	NA	2 MCL	0.24 N	2	No	FOD
7440-62-2	Vanadium	5.3	78.2	ug/L	GPT-03-17GW-001	7/24	5 - 5	78.2	NA	25.6 N	3.6 N	NA	Yes	ASL
7440-66-6	Zinc	5	41.7	ug/L	GPT-03-15GW-001	18/24	5 - 5	41.7	NA	1100 N	1100 N	NA	No	BSL

**TABLE 6-5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH GROUNDWATER
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
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CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TRGs ⁽⁵⁾	USEPA Region IX PRG Tap Water ⁽⁶⁾	USEPA MCL ⁽⁷⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁸⁾
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Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
 - 2 - Values presented are sample-specific quantitation limits.
 - 3 - The maximum detected concentration is used for screening purposes.
 - 4 - No background samples were collected for groundwater.
 - 5 - Mississippi Department of Environmental Quality (MDEQ), Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites for Unrestricted and Restricted Land Use, February 2002. Noncarcinogenic values are divided by 10.
 - 6 - USEPA Region IX Preliminary Remediation Goal (PRG). The noncarcinogenic values (denoted with a "N" flag) are the PRG divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag) (USEPA Region IX, October 2004, Updated December 28, 2004).
 - 7 - USEPA Drinking Water Standards and Health Advisories, August 2006.
 - 8 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
 - 9 - The toxicity criteria in the October 2004 PRG table is outdated. Value was updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table.
- Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Definitions:

- C = Carcinogen
- COPC = Chemical Of Potential Concern
- J = Estimated value
- N = Noncarcinogen
- NA = Not Applicable/Not Available
- MCL = Maximum contaminant level.

Rationale Codes:

- For selection as a COPC:
 - ASL = Above Screening Level and site background.
- For elimination as a COPC:
 - BSL = Below COPC Screening Level
 - FOD = Frequency of Detection
 - NUT = Essential nutrient
 - NTX = No toxicity criteria

Associated Samples

03GP0101	03GP1402	03GP1001	03GP2102	GPT-03-13GW-001
03GP0102	03GP1403	03GP1002	03GP2103	GPT-03-13GW-001D
03GP0103	03GP1404	03GP1003	03GP2104	GPT-03-14GW-001
03GP0201	03GP1501	03GP1004	03GP2201	GPT-03-15GW-001
03GP0202	03GP1502	03GP1101	03GP2202	GPT-03-16GW-001
03GP0203	03GP1503	03GP1102	03GP2203	GPT-03-17GW-001
03GP0301	03GP1601	03GP1103	03GP2204	GPT-03-18GW-001
03GP0302	03GP1602	03GP1104	03GP2301	GPT-03-19GW-001
03GP0303	03GP1603	03GP1201	03GP2302	GPT-03-20GW-001
03GP0402	03GP1604	03GP1202	03GP2303	GPT-03-21GW-001
03GP0403	03GP1701	03GP1203	03GP2304	GPT-03-22GW-001
03GP0501	03GP1702	03GP1204	GPT-03-08GW-001	GPT-03-23GW-001
03GP0502	03GP1703	03GP1301	GPT-03-09GW-001	GPT-03-24GW-001
03GP0503	03GP1704	03GP1302	GPT-03-10GW-001	GPT-03-25GW-001
03GP0601	03GP1801	03GP1303	GPT-03-11GW-001	GPT-03-26GW-001
03GP0602	03GP1802	03GP1401	GPT-03-12GW-001	GPT-03-27GW-001
03GP0603	03GP1803			GPT-03-28GW-001
03GP0701	03GP1804			GPT-03-29GW-001
03GP0702	03GP1901			GPT-03-30GW-001
03GP0703	03GP1902			GPT-03-30GW-001-D
03GP0801	03GP1903			GPT-03-31GW-001
03GP0802	03GP1904			GPT-03-31GW-001-D
03GP0803	03GP2001			
03GP0804	03GP2002			
03GP0901	03GP2003			
03GP0902	03GP2004			
03GP0903	03GP2101			

All COPCs except lead exceeded the screening criteria based on USEPA Region 9 PRGs. However, concentrations of 1,2,4-TCB; 1,2-DCA; trans-1,2-DCE; and chromium did not exceed USEPA MCLs or MDEQ TRGs, and concentrations of aluminum, iron, manganese, and vanadium did not exceed USEPA MCLs. Concentrations of lead reported for one sample exceeded the SDWA action level (15 ppb). Thallium was also detected at a concentration exceeding the USEPA Region 9 PRG, USEPA MCL, and MDEQ TRG. However, thallium was detected in only 1 of 24 groundwater samples. In addition, the detected concentration occurred in a monitoring well located outside of the groundwater plume. Therefore, thallium was not retained as a COPC in groundwater.

Vapor Intrusion Pathway from Groundwater to the Indoor Air of a Building

Vapor Intrusion is the migration of volatile chemicals from the subsurface into overlying buildings. Volatile chemicals in buried wastes, soil, and/or contaminated groundwater can emit vapors that may migrate from subsurface strata and into indoor air spaces of overlying or adjoining buildings (USEPA, 2002a). Because VOCs were detected in groundwater samples at Site 3, COPCs for groundwater were also selected based on a comparison of maximum detected concentrations to USEPA screening concentrations designed to conservatively evaluate the potential for vapor intrusion into a building. The results of the comparison of maximum concentrations in groundwater to USEPA GVCs (2002a) are presented in Table 6-6. The following chemicals were detected in groundwater at maximum concentrations exceeding the COPC screening levels for vapor intrusion from groundwater to soil and were retained as COPCs:

- Volatiles – cis-1,2-DCE, benzene, TCE, vinyl chloride, and chloromethane

6.3.5 COPC Selection for Surface Water

A comparison of maximum detected surface water concentrations to screening levels based on USEPA Region 9 PRGs for ingestion of tap water and MDEQ TRGs is presented in Table 6-7. The following chemicals were retained as COPCs for surface water:

- Semivolatiles – bis(2-ethylhexyl)phthalate
- Inorganics – iron and manganese

These constituents exceeded the USEPA Region 9 risk-based screening concentrations and MDEQ Tier 1 TRGs for tap water. The use of these criteria for surface water assumes that the surface water is used as a drinking source (i.e., potential receptors ingest 2 liters of water per day for 350 days per year). Drinking water criteria are used because surface water criteria for human health are currently not available. The use of these criteria for screening and risk assessment is conservative because it is

**TABLE 6-6
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - VAPOR INTRUSION FROM GROUNDWATER
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	USEPA Groundwater Volatilization Criteria ⁽⁵⁾	Potential ARAR/TBC	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁶⁾
Volatile Organic Compounds														
75-35-4	1,1-Dichloroethene	0.7 J	2.2	ug/L	03GP1803	2/105	0.13 - 10	2.2	NA	190 N	NA	NA	No	BSL
120-82-1	1,2,4-Trichlorobenzene	1.2	1.2	ug/L	03GP0201	1/95	0.14 - 10	1.2	NA	3400 N	NA	NA	No	BSL
107-06-2	1,2-Dichloroethane	1.4	1.6	ug/L	03GP0201, 03GP0202	3/105	0.13 - 10	1.6	NA	5 MCL	NA	NA	No	BSL
67-64-1	Acetone	13.9	13.9	ug/L	GPT-03-16GW-001	1/105	1.1 - 1000	13.9	NA	220000 N	NA	NA	No	BSL
71-43-2	Benzene	0.14 J	12	ug/L	03GP0301	10/105	0.11 - 10	12	NA	5 MCL	NA	NA	Yes	ASL
108-90-7	Chlorobenzene	1.1	1.1	ug/L	03GP1103, 03GP1803	2/105	0.1 - 10	1.1	NA	390 N	NA	NA	No	BSL
74-87-3	Chloromethane	10 J	10 J	ug/L	GPT-03-26GW-001	1/105	0.28 - 10	10	NA	6.7 C	NA	NA	Yes	ASL
156-59-2	cis-1,2-Dichloroethene	0.87 J	880	ug/L	GPT-03-23GW-001	40/105	0.14 - 5	880	NA	210 N	NA	NA	Yes	ASL
110-82-7	Cyclohexane	1 J	1 J	ug/L	GPT-03-26GW-001	1/14	0.12 - 1.2	1	NA	NA	NA	NA	No	NTX
108-87-2	Methyl Cyclohexane	2.1 J	2.2	ug/L	GPT-03-26GW-001	2/14	0.12 - 1.2	2.2	NA	710 N	NA	NA	No	BSL
75-09-2	Methylene Chloride	12 J	14 J	ug/L	GPT-03-23GW-001	2/105	0.23 - 10	14	NA	58 C	NA	NA	No	BSL
156-60-5	trans-1,2-Dichloroethene	0.16 J	87.4	ug/L	03GP0202	18/105	0.15 - 10	87.4	NA	180 N	NA	NA	No	BSL
79-01-6	Trichloroethene	0.3 J	300	ug/L	GPT-03-21GW-001	22/105	0.23 - 10	300	NA	5 MCL	NA	NA	Yes	ASL
75-01-4	Vinyl Chloride	0.34 J	150	ug/L	03GP0301	31/105	0.19 - 10	150	NA	2 MCL	NA	NA	Yes	ASL

Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
- 2 - Values presented are sample-specific quantitation limits.
- 3 - The maximum detected concentration is used for screening purposes.
- 4 - No background samples were collected for groundwater.
- 5 - Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils. November 2002. EPA530-F-02-052. Values are from Table 2c and correspond to a target cancer risk level of 1E-6 or HI =1 and an attenuation factor of 0.001.
- 6 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.

Definitions:

- ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
 C = Carcinogen
 COPC = Chemical Of Potential Concern
 J = Estimated value
 MCL = Maximum contaminant level
 N = Noncarcinogen
 NA = Not Applicable/Not Available

Shaded criterion indicates that the maximum detected concentration exceeds the screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Rationale Codes:

- For selection as a COPC:
 ASL = Above Screening Level and site background.

Associated Samples

03GP0101	03GP0802	03GP1401	03GP1903	GPT-03-11GW-001	GPT-03-30GW-001-D
03GP0102	03GP0803	03GP1402	03GP1904	GPT-03-12GW-001	GPT-03-31GW-001
03GP0103	03GP0804	03GP1403	03GP2001	GPT-03-13GW-001	GPT-03-31GW-001-D
03GP0201	03GP0901	03GP1404	03GP2002	GPT-03-13GW-001D	
03GP0202	03GP0902	03GP1501	03GP2003	GPT-03-14GW-001	
03GP0203	03GP0903	03GP1502	03GP2004	GPT-03-15GW-001	
03GP0301	03GP1001	03GP1503	03GP2101	GPT-03-16GW-001	
03GP0302	03GP1002	03GP1601	03GP2102	GPT-03-17GW-001	
03GP0303	03GP1003	03GP1602	03GP2103	GPT-03-18GW-001	
03GP0402	03GP1004	03GP1603	03GP2104	GPT-03-19GW-001	
03GP0403	03GP1101	03GP1604	03GP2201	GPT-03-20GW-001	
03GP0501	03GP1102	03GP1701	03GP2202	GPT-03-21GW-001	
03GP0502	03GP1103	03GP1702	03GP2203	GPT-03-22GW-001	
03GP0503	03GP1104	03GP1703	03GP2204	GPT-03-23GW-001	
03GP0601	03GP1201	03GP1704	03GP2301	GPT-03-24GW-001	
03GP0602	03GP1202	03GP1801	03GP2302	GPT-03-25GW-001	
03GP0603	03GP1203	03GP1802	03GP2303	GPT-03-26GW-001	
03GP0701	03GP1204	03GP1803	03GP2304	GPT-03-27GW-001	
03GP0702	03GP1301	03GP1804	GPT-03-08GW-001	GPT-03-28GW-001	
03GP0703	03GP1302	03GP1901	GPT-03-09GW-001	GPT-03-29GW-001	
03GP0801	03GP1303	03GP1902	GPT-03-10GW-001	GPT-03-30GW-001	

- For elimination as a COPC:
 BSL = Below COPC Screening Level
 NUT = Essential nutrient
 NTX = No toxicity criteria

**TABLE 6-7
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SURFACE WATER
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	USEPA Region IX PRG Tap Water ⁽⁵⁾	MDEQ TRGs ⁽⁶⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁷⁾
Volatile Organic Compounds													
67-64-1	Acetone	4 J	4 J	ug/L	03SW1501	1/8	5 - 5	4	5 - 8	550 N	60.8 N	No	BSL
Semivolatile Organic Compounds													
117-81-7	Bis(2-ethylhexyl)phthalate	19	19	ug/L	03SW1501	1/8	10 - 10	19	11	4.8 C	6 MCL	Yes	ASL
Inorganics													
7429-90-5	Aluminum	427	427	ug/L	03SW1501	1/8	21.2 - 398	427	442	3600 N	3650 N	No	BSL
7440-39-3	Barium	1.9	53.3	ug/L	03SW1501	8/8	-	53.3	20.5 - 51.9	730 N ⁽⁸⁾	2000 MCL	No	BSL
7440-70-2	Calcium	2680	22000	ug/L	03SW0501	8/8	-	22000	9740 - 12600	NA	NA	No	NUT
7440-50-8	Copper	13	15.5	ug/L	03SW1501	2/8	3.19 - 3.19	15.5	12.6 - 20.7	150 N	1300 MCL	No	BSL
7439-89-6	Iron	135	3680	ug/L	03SW0501	7/8	131 - 131	3680	696 - 2180	2600 N⁽⁵⁾	1100 N	Yes	ASL
7439-92-1	Lead	1.9	1.9	ug/L	03SW0301, 03SW1501	2/8	1.8 - 1.8	1.9	1.9 - 3.4	NA	15 MCL	No	BSL
7439-95-4	Magnesium	1720	4150	ug/L	03SW0401	8/8	-	4150	2300 - 3000	NA	NA	No	NUT
7439-96-5	Manganese	8	98.2	ug/L	03SW0301	8/8	-	98.2	50.7 - 130	88 N	73 N	Yes	ASL
7440-09-7	Potassium	5520	6010	ug/L	03SW0601D	2/8	1570 - 3880	6010	5090	NA	NA	No	NUT
7782-49-2	Selenium	4.7	4.7	ug/L	03SW0601D	1/8	4.04 - 4.04	4.7	ND	18 N	50 MCL	No	BSL
7440-23-5	Sodium	13400	21600	ug/L	03SW0601	8/8	-	21600	11600 - 23500	NA	NA	No	NUT
7440-66-6	Zinc	3.4	13.4	ug/L	03SW0301	7/8	3.22 - 3.22	13.4	5.8 - 9.6	1100 N	1100 N	No	BSL

Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
- 2 - Values presented are sample-specific quantitation limits.
- 3 - The maximum detected concentration is used for screening purposes.
- 4 - Samples 03SW1001, 03SW110, 03SW1201, 03SW1301, 03SW1401, and 03SW1601.
- 5 - USEPA Region IX Preliminary Remediation Goal (PRG). The noncarcinogenic values (denoted with a "N" flag) are the PRG divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag) (USEPA Region IX, October 2004, Updated December 28, 2004).
- 6 - Mississippi Department of Environmental Quality (MDEQ), Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites for Unrestricted and Restricted Land Use, February 2002. Noncarcinogenic values are divided by 10.
- 7 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
- 8 - The toxicity criteria in the October 2004 PRG table is outdated. Value was updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table. Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Definitions:

- C = Carcinogen
- COPC = Chemical Of Potential Concern
- J = Estimated value
- N = Noncarcinogen
- NA = Not Applicable/Not Available
- MCL = Maximum contaminant level.

Rationale Codes:

- For selection as a COPC:
ASL = Above Screening Level and site background.

For elimination as a COPC:

- BSL = Below COPC Screening Level
- NUT = Essential nutrient
- NTX = No toxicity criteria

Associated Samples

- 03SW0101
- 03SW0201
- 03SW0301
- 03SW0401
- 03SW0501
- 03SW0601
- 03SW0601D
- 03SW0701
- 03SW1501

unlikely that the water in Canal No. 1 downgradient of the site would ever be used as a source of drinking water. Upstream data from the site are included in Table 6-7 for comparison purposes.

6.3.6 COPC Selection for Sediment

Table 6-8 presents the results of the comparison of maximum detected sediment concentrations to USEPA Region 9 PRGs and MDEQ TRGs and summarizes the COPC selection process for sediment at Site 3. Aluminum, arsenic, iron, and vanadium were retained as COPCs for sediment.

These constituents were identified as COPCs for sediment because the maximum detected concentrations exceeded the human health risk screening levels for residential land use (i.e., USEPA Region 9 risk-based screening levels for residential soil and MDEQ Tier 1 TRGs for restricted and unrestricted land use). The maximum detected concentrations of aluminum and iron exceeded MDEQ Tier 1 TRGs for unrestricted land use and screening levels based on USEPA Region 9 PRGs, but they did not exceed MDEQ Tier 1 TRGs for restricted land use. The maximum concentration of arsenic exceeded screening levels based on USEPA Region 9 PRGs for residential soil and MDEQ Tier 1 TRGs for restricted and unrestricted land use. The maximum concentration of vanadium did not exceed either MDEQ Tier 1 TRG (restricted or unrestricted) but did exceed the USEPA Region 9 PRG. However, the maximum concentrations of the metals identified as COPCs for sediment are within the range of naturally occurring soil levels found in the continental United States (Dragun, 1988). In addition, the use of the USEPA Region 9 and MDEQ RBCs for soil to evaluate COPC concentrations in sediment is conservative because these criteria were established assuming residential land use scenarios (i.e., routine daily contact with soil). However, it is anticipated that a human receptor would be exposed to sediment in Canal No. 1 on a less frequent basis than is assumed for a typical residential exposure to soil. Consequently, the use of soil criteria for COPC screening and risk estimation is likely to overestimate potential risks from exposure to sediment.

6.3.7 Summary

Table 6-9 summarizes the chemicals retained as COPCs for soil, groundwater, surface water, and sediment at Site 3. RAGS Part D tables for COPC selection are included in Appendix D-1.

6.4 EXPOSURE ASSESSMENT

The exposure assessment estimates the extent of human contact with COPCs by characterizing potentially exposed populations of individuals (i.e., receptors), identifying actual or potential pathways of exposure that are appropriate for each potential receptor, and estimating the extent of human exposure.

**TABLE 6-8
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SEDIMENT
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
PAGE 1 OF 2**

CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TRGs Unrestricted Value ⁽⁵⁾	MDEQ TRGs Restricted Value ⁽⁵⁾	USEPA Region IX PRGs Residential ⁽⁶⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁷⁾
Volatile Organic Compounds														
67-64-1	Acetone	18 J	160 J	ug/kg	03SD0801	9/10	75 - 75	160	21 - 290	782000 N	10400000 N	1400000 N	No	BSL
75-15-0	Carbon Disulfide	7 J	7 J	ug/kg	03SD0401	1/10	5 - 10	7	3	797 N	797 N	36000 N	No	BSL
Pesticides/PCBs														
72-54-8	4,4'-DDD	1.7 J	3.1 J	ug/kg	03SD0201	3/10	3.8 - 5.6	3.1	ND	2660 C	23800 C	2400 C	No	BSL
72-55-9	4,4'-DDE	1.4 J	3.7 J	ug/kg	03SD0101	4/10	3.8 - 4.7	3.7	ND	1880 C	16800 C	1700 C	No	BSL
50-29-3	4,4'-DDT	4.4 J	9.8	ug/kg	03SD0101	3/10	3.8 - 4.7	9.8	ND	1880 C	16800 C	1700 C	No	BSL
319-84-6	alpha-BHC	1.8 J	2.1 J	ug/kg	03SD0601D	2/10	2 - 2.9	2.1	1.5 - 1.9	101 C	908 C	90 C	No	BSL
5103-71-9	alpha-Chlordane	2.2 J	3.3	ug/kg	03SD0601D	2/10	2 - 2.6	3.3	ND	1820 C ⁽⁸⁾	12300 C ⁽⁸⁾	1600 C ⁽⁸⁾	No	BSL
11097-69-1	Aroclor-1254	35	86	ug/kg	03SD0101	3/10	20 - 26	86	ND	1000 C	10000 C	220 C ⁽⁹⁾	No	BSL
11096-82-5	Aroclor-1260	32	130	ug/kg	03SD0101	4/10	20 - 24	130	ND	1000 C	10000 C	220 C ⁽⁹⁾	No	BSL
319-86-8	delta-BHC	2 J	2 J	ug/kg	03SD0901	1/10	2 - 2.9	2	2.4	101 C ⁽¹⁰⁾	908 C ⁽¹⁰⁾	90 C ⁽¹⁰⁾	No	BSL
60-57-1	Dieldrin	1.9 J	2.8 J	ug/kg	03SD0201	3/9	3.8 - 5	2.8	ND	39.9 C	358 C	30 C	No	BSL
72-20-8	Endrin Ketone	3.2 J	3.2 J	ug/kg	03SD0101	1/10	3.8 - 5.6	3.2	2.8	2350 N ⁽¹¹⁾	6130 N ⁽¹¹⁾	1800 N ⁽¹¹⁾	No	BSL
58-89-9	gamma-BHC (Lindane)	2 J	2 J	ug/kg	03SD0201	1/10	2 - 2.9	2	2.3	491 C	4400 C	440 C	No	BSL
5103-74-2	gamma-Chlordane	1.5 J	2.1 J	ug/kg	03SD0601D	2/10	2 - 2.6	2.1	ND	1820 C ⁽⁸⁾	12300 C ⁽⁸⁾	1600 C ⁽⁸⁾	No	BSL
	Total Aroclor	56	216	ug/kg	03SD0101	4/10	20 - 24	216	ND	1000 C	10000 C	220 C ⁽⁹⁾	No	BSL
Inorganics														
7429-90-5	Aluminum	713	15600	mg/kg	03SD0401	10/10	-	15600	1640 - 9090	7820 N	204000 N	7500 N ⁽⁶⁾	Yes	ASL
7440-38-2	Arsenic	2.9	13.2	mg/kg	03SD0301	6/10	0.28 - 1.4	13.2	3.7 - 4.6	0.426 C	3.82 C	0.39 C	Yes	ASL
7440-39-3	Barium	1.7	38.3	mg/kg	03SD0101	10/10	-	38.3	3.4 - 30.2	548 N	1430 N	1500 N ⁽¹²⁾	No	BSL
7440-70-2	Calcium	74.4	892	mg/kg	03SD0401	8/10	18.8 - 23.9	892	112 - 628	NA	NA	NA	No	NUT
7440-47-3	Chromium	1.4	17.1	mg/kg	03SD0401	10/10	-	17.1	2.7 - 10	227 C ⁽¹³⁾	450 C ⁽¹³⁾	30 C	No	BSL
7440-48-4	Cobalt	0.84	2	mg/kg	03SD0101	5/10	0.11 - 0.95	2	1.3	469 N	1230 N	140 N ⁽¹⁴⁾	No	BSL
7440-50-8	Copper	2.3	9.3	mg/kg	03SD0401	7/10	0.9 - 1.9	9.3	4.1	313 N	817 N	310 N	No	BSL
7439-89-6	Iron	579	12000	mg/kg	03SD0401	10/10	-	12000	1010 - 10200	2350 N	61300 N	5500 N ⁽⁶⁾	Yes	ASL
7439-92-1	Lead	2.6	22	mg/kg	03SD0401	9/10	0.71 - 0.71	22	1.9 - 12.8	400	1700	400	No	BSL
7439-95-4	Magnesium	33.2	568	mg/kg	03SD0401	10/10	-	568	76.3 - 377	NA	NA	NA	No	NUT
7439-96-5	Manganese	1.7	33.4	mg/kg	03SD0101	10/10	-	33.4	2.9 - 11.8	156 N	408 N	180 N	No	BSL
7439-97-6	Mercury	0.01	0.07	mg/kg	03SD0401	6/10	0.01 - 0.01	0.07	0.02	1 N	6.13 N	2.3 N	No	BSL
7440-02-0	Nickel	3	6.2	mg/kg	03SD0401	6/10	0.87 - 1.7	6.2	4.2	156 N	408 N	160 N	No	BSL
7440-23-5	Sodium	37.4	39	mg/kg	03SD0101	2/10	4.8 - 23.2	39	ND	NA	NA	NA	No	NUT
7440-62-2	Vanadium	1.3	25.4	mg/kg	03SD0401	10/10	-	25.4	2.9 - 13.8	54.8 N	143 N	7.8 N	Yes	ASL
7440-66-6	Zinc	1.3	57.5	mg/kg	03SD0401	10/10	-	57.5	1.8 - 33	2350 N	6130 N	2300 N	No	BSL

**TABLE 6-8
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT WITH SEDIMENT
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
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CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TRGs Unrestricted Value ⁽⁵⁾	MDEQ TRGs Restricted Value ⁽⁵⁾	USEPA Region IX PRGs Residential ⁽⁶⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁷⁾
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Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
 - 2 - Values presented are sample-specific quantitation limits.
 - 3 - The maximum detected concentration is used for screening purposes.
 - 4 - Samples 03SD1001, 03SD1101, 03SD1201, 03SD1301, 03SD1401, and 03SD1601.
 - 5 - Mississippi Department of Environmental Quality (MDEQ), Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites for Unrestricted and Restricted Land Use, February 2002. Noncarcinogenic values are divided by 10.
 - 6 - USEPA Region IX Preliminary Remediation Goal (PRG). The noncarcinogenic values (denoted with a "N" flag) are the PRG divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag) (USEPA Region IX, October 2004, Updated December 28, 2004).
 - 7 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and is statistically determined to be greater than site background.
 - 8 - Chlordane is used as a surrogate for alpha- and gamma-chlordane.
 - 9 - The values for Total PCBs is presented.
 - 10 - alpha-BHC is used as a surrogate for delta-BHC.
 - 11 - Endrin is used as a surrogate for Endrin Aldehyde and Endrin Ketone.
 - 12 - The toxicity criteria in the October 2004 PRG table is outdated. Value was updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table.
 - 13 - Values are for hexavalent chromium.
 - 14 - One tenth of the noncarcinogenic PRG is less than the carcinogenic PRG, therefore the one tenth noncarcinogenic PRG is presented.
- Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Definitions:

- ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
- C = Carcinogen
- COPC = Chemical Of Potential Concern
- J = Estimated value
- N = Noncarcinogen
- NA = Not Applicable/Not Available
- ND = Not detected

Rationale Codes:

- For selection as a COPC:
ASL = Above Screening Level and site background.

- For elimination as a COPC:
BKG = Less than Background Concentration
BSL = Below COPC Screening Level
NUT = Essential nutrient

NTX = No toxicity criteria

Associated Samples

- 03SD0101
- 03SD0201
- 03SD0301
- 03SD0401
- 03SD0501
- 03SD0601
- 03SD0601D
- 03SD0701
- 03SD0801
- 03SD0901
- 03SD1501

TABLE 6-9
CHEMICALS RETAINED AS COPCs
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Chemical	Surface Soil			Subsurface Soil			Ground Water		Surface Water	Sediment
	Direct Contact	Soil to Air	Soil to Groundwater	Direct Contact	Soil to Air	Soil to Groundwater	Direct Contact	Vapor Intrusion		
Volatile Organic Compounds										
1,2,4-Trichlorobenzene							X			
1,2-Dichloroethane							X			
Benzene							X	X		
Chloromethane								X		
cis-1,2-Dichloroethene							X	X		
Methylene Chloride							X			
trans-1,2-Dichloroethene							X			
Trichloroethene							X	X		
Vinyl Chloride						X	X	X		
Semivolatile Organic Compounds										
Benzo(a)anthracene	X		X							
Benzo(a)pyrene	X									
Benzo(b)fluoranthene	X									
Bis(2-ethylhexyl)phthalate									X	
Chrysene			X							
Benzo(a)pyrene Equivalents	X									
Pesticides/PCBs										
alpha-BHC			X							
beta-BHC			X			X				
Dieldrin			X							
gamma-BHC (Lindane)			X			X				
Inorganics										
Aluminum			X			X	X			X
Antimony			X							
Arsenic	X			X		X	X			X
Barium						X				
Cadmium			X							
Chromium			X			X	X			
Cobalt			X							
Iron	X			X			X		X	X
Lead							X			
Manganese							X		X	
Selenium			X							
Vanadium	X			X			X			X

Notes

X - Indicates chemical was retained as a COPC.

An exposure pathway identifies the exposure routes for potentially complete pathways at the site and describes the mechanism by which human receptors may be exposed to site-related COPCs. Exposure pathways are dependent on both current and future land use. An exposure pathway is defined by the following four elements (USEPA, 2005e):

- A source material and mechanism of constituent release to the environment.
- An environmental migration or transport medium (e.g., soil) for the COPCs.
- A point of potential human contact with the medium of interest (e.g., potential exposure to the contaminated soil).
- An exposure route (e.g., ingestion, dermal contact) at the point of contact.

An exposure pathway is considered "complete" if all elements are present. If complete and significant, these pathways are quantitatively evaluated in the risk assessment.

The potential for exposure at Site 3 is based on several factors including current and future land uses, human activity patterns, site access controls, chemical behavior in the environment, and the presence of human receptors. Based on these variables, exposure scenarios are developed that characterize the potential for human exposure under both current and future site conditions. The future scenario accounts for potential or anticipated changes in land use and site characteristics that may alter exposure conditions at the site. The exposure assessment assumes that, in general, chemical compositions for environmental media are identical under current and future site conditions.

The exposure assessment presented in this section of the report describes the physical site setting and potential receptors of concern, identifies the potential contaminant migration and exposure pathways, defines the contaminant concentrations at the point of exposure, and presents the equations used to quantify exposure in terms of contaminant intake (dose). Appendix D-1 presents calculations of the chemical-specific intakes for all receptors and exposure pathways, and Appendix D-2 contains example calculations of chemical intakes.

A summary of the potentially significant exposure pathways identified for quantitative evaluation for Site 3 is provided in Table 6-10. Rationales for the selection or elimination of exposure pathways are presented in RAGS Part D Table 1 in Appendix D-1.

TABLE 6-10
EXPOSURE ROUTES FOR QUANTITATIVE EVALUATION
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Receptors	Exposure Routes
Construction/Excavation Workers (Current/Future)	<ul style="list-style-type: none"> • Soil dermal contact (surface/subsurface) • Soil incidental ingestion (surface/subsurface) • Inhalation of air/dust/emissions • Groundwater dermal contact (during excavation) • Inhalation of volatiles in groundwater(in a trench during excavation) • Surface water incidental ingestion • Surface water dermal contact • Sediment incidental ingestion • Sediment dermal contact
Site Maintenance Workers (Current/Future)	<ul style="list-style-type: none"> • Soil incidental ingestion (surface/subsurface) • Soil dermal contact (surface/subsurface) • Inhalation of air/dust/emissions • Surface water incidental ingestion • Surface water dermal contact • Sediment incidental ingestion • Sediment dermal contact
Site Industrial Workers (Current/Future)	<ul style="list-style-type: none"> • Soil incidental ingestion (surface/subsurface) • Soil dermal contact (surface/subsurface) • Inhalation of air/dust/emissions • Surface water incidental ingestion • Surface water dermal contact • Sediment incidental ingestion • Sediment dermal contact
Trespassers (Adolescent and Adult) (Current/Future)	<ul style="list-style-type: none"> • Soil incidental ingestion (surface/subsurface) • Soil dermal contact (subsurface) • Inhalation of air/dust/emissions • Surface water incidental ingestion • Surface water dermal contact • Sediment incidental ingestion • Sediment dermal contact
Residents (Children/Adult) (Future)	<ul style="list-style-type: none"> • Soil incidental ingestion (surface/subsurface) • Soil dermal contact (surface/subsurface) • Inhalation of air/dust/emissions • Direct ingestion of groundwater • Groundwater dermal contact (showering/bathing) • Inhalation of volatiles in groundwater (showering/bathing and via vapor intrusion) • Surface water incidental ingestion • Surface water dermal contact • Sediment incidental ingestion • Sediment dermal contact

6.4.1 Land Use and Site Access

Site 3 is a former landfill and burning pit approximately 3.5 acres in size, located near the intersection of 8th street and Colby Avenue, and currently used as part of a fairway at the Pine Bayou Golf Course.

An estimated 130,000 gallons of waste liquids were disposed at the site including fuels, oils, solvents (methyl ethyl ketone, toluene, xylene), paints, and paint thinners. In addition, 30,000 tons of solid wastes were disposed at the landfill. As mentioned above, Site 3 is currently part of a golf course fairway and is expected to be used for this purpose in the future. Access to the site is not restricted, and older children could potentially play on the site.

6.4.2 Conceptual Site Model

The development of a conceptual site model (CSM) is an essential component of the exposure assessment. The CSM integrates information regarding the physical characteristics of the site, exposed populations, sources of contamination, and contaminant mobility (fate and transport) to identify potential exposure routes and receptors to be evaluated in the risk assessment. A well-developed CSM allows a better understanding of the risks at a site and will aid risk managers in identifying the potential need for both environmental sampling and remediation. The site-specific CSM for Site 3 is presented in this section and illustrated on Figure 6-1. Table 6-10 presents a summary of the exposure pathways that are addressed quantitatively for each human receptor. The CSM depicts the relationships among the following elements:

- Site sources of contamination
- Contaminant release mechanisms
- Transport/migration pathways
- Exposure routes/pathways
- Potential receptors

These elements of the CSM for Site 3 are discussed in the following sections.

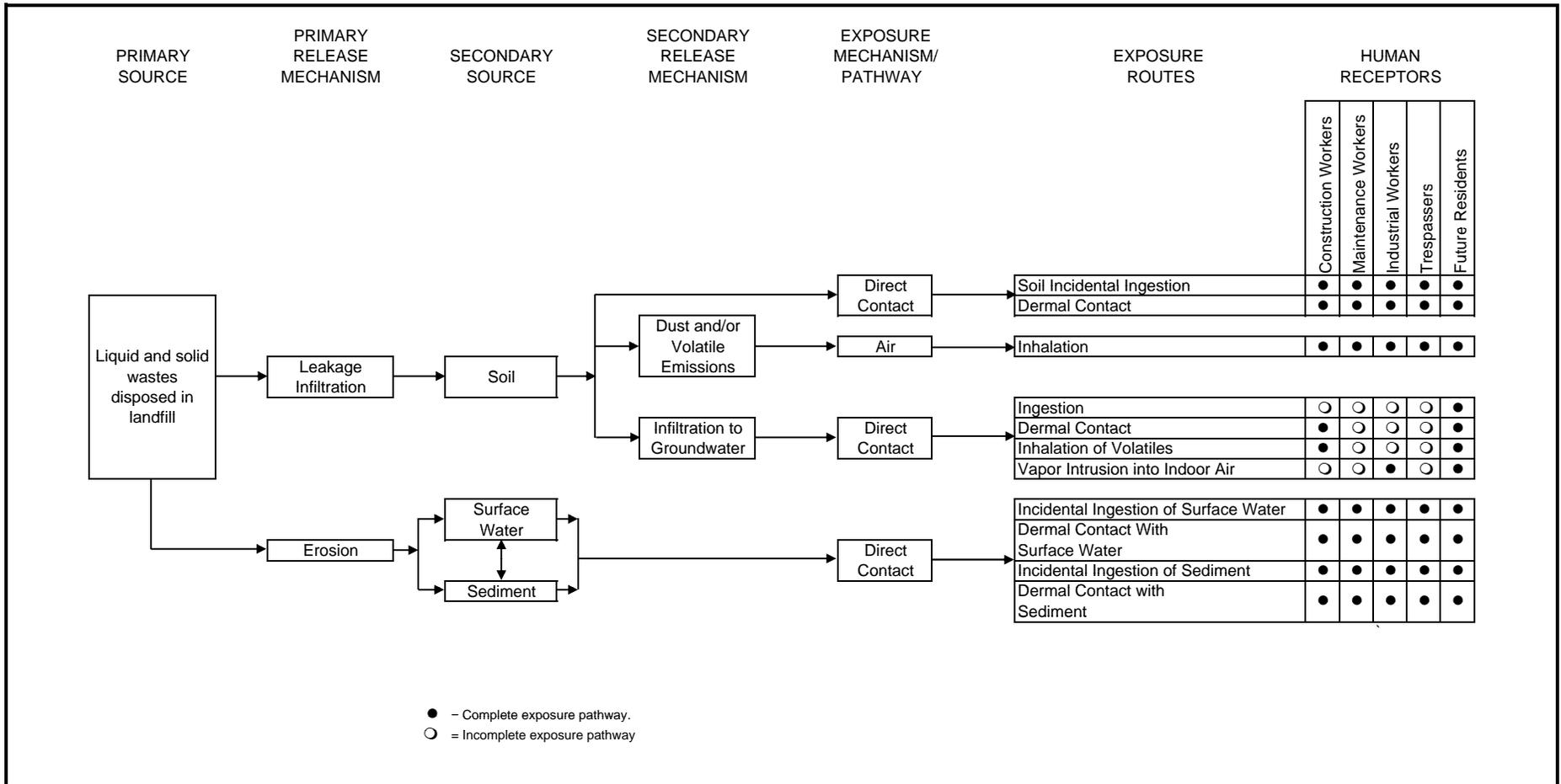
6.4.2.1 Site Sources of Contamination/Release Mechanisms/Migration Pathways

Previous investigations have identified the following potential sources of contamination at Site 3:

- Liquid and solid wastes disposed in the landfill
- Backfill incineration byproducts

FIGURE 6-1

CONCEPTUAL SITE MODEL
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI



Based on historical site data and sampling, the following parameters are among the site-related chemical contaminants known to be present or potentially present in environmental media at Site 3:

- VOCs
- SVOCs
- Pesticides
- Metals

However, based on the nature and extent narrative presented in Section 4 and the data summaries provided in the COPC selection tables, VOCs in groundwater are the primary site-related COPCs at Site 3.

The topography at Site 3 is relatively flat, and the ground surface is primarily fill dirt and native sand with predominantly grassy vegetative cover. The vegetation cover is augmented by fairway and green maintenance by golf course personnel. Canal No. 1 runs along the eastern boundary of the site and conveys surface water north where it exits the base through a culvert under 28th Street. The cover material is a fine to medium sand with little silt, which allows infiltration or seepage into the landfill.

Potential contaminant release mechanisms at Site 3 include the mobilization of contaminants from wastes buried in subsurface soil to the local groundwater as the result of infiltration of precipitation and dissolution of soluble contaminants. Soluble constituents can be transported to the shallow aquifer by rainwater infiltration at which point they may continue to move hydrologically downgradient toward Canal No. 1 east of the site. Groundwater may discharge as seeps or upwelling groundwater to Canal No. 1. Contaminants might migrate vertically and effect several downgradient water supply wells. However, these wells are screened approximately 500 feet bls with a significant confining layer at about 150 to 250 feet bls. This confining layer was identified and reported by the Office of Land and Water Resources in PWS Report PWS-ID: 240005 Source ID: 12, June 31, 1993, which pertains to wells installed within 2 miles of Site 3.

Currently, erosion and overland transport of particulate matter from site surface soil do not appear to be important transport mechanisms at Site 3 due to the presence of several feet of clean fill covering the site and stabilization of site soil by golf course grass maintenance.

Figure 6-1 presents the CSM that illustrates these potential contaminant migration pathways.

6.4.2.2 Potential Receptors

NCBC Gulfport is an active facility and is expected to remain active for the near future. Site 3 is currently part of a golf course and is expected to be used for this purpose for the near future. Access to the site is not restricted, and older children could potentially play on the site. Because the site is currently active and access is not limited, the baseline HHRA considered receptor exposure under residential, industrial, and trespasser/recreational user land use scenarios.

Exposure to contaminated soil at the site under current land use is expected to be limited to surface soil. However, exposure to chemicals in subsurface soil could occur if the soil was uncovered (e.g., during excavation). In this scenario, it is assumed that subsurface soil would be brought to the surface during activities and mixed with surface soil. Potential receptors were assumed to be exposed to this surface/subsurface soil mixture. A receptor may be exposed to soil by inadvertent ingestion of a small amount of soil, by dermal absorption of contaminants from the soil, or by inhalation of vapors or particulates emitted from soil.

Based on current and potential future land use, the following potential receptors further described in Table 6-10 may be exposed to contaminated environmental media within the study area:

- **Maintenance Worker** – A plausible receptor under current or future land use. This includes adult military or civilian personnel assigned routine daily maintenance tasks of the golf course and base security personnel who are on the site for a limited time. This receptor is assumed to be exposed to soil (by ingestion, dermal contact, and inhalation), sediment (by ingestion and dermal contact), and surface water (by ingestion and dermal contact).
- **Trespassers (Adult and Adolescent)** – A plausible receptor under current or future land use. This receptor is assumed to be exposed to soil (by ingestion, dermal contact, and inhalation), sediment (by ingestion and dermal contact), and surface water (by ingestion and dermal contact).
- **Construction/Excavation Worker** – A plausible receptor under future land use. Construction activities are currently planned for the northwest corner of the base and may occur at or near Site 3. Construction workers are considered for future land use only and are assumed to be exposed to soil (by inhalation, dermal contact, and ingestion), sediment (by ingestion and dermal contact), groundwater (by dermal contact and inhalation of volatiles), and surface water (by ingestion, dermal contact).
- **Industrial Worker** – A plausible receptor under current and future land use. This includes adult military and civilian personnel working at Site 3 who are at the site on a full-time basis. This includes

groundskeepers and other on-site workers. These workers are assumed to be exposed to soil (by ingestion, dermal contact, and inhalation), sediment (by ingestion and dermal contact), groundwater (by vapor intrusion into indoor air), and surface water (by ingestion and dermal contact).

- **Future Residents (Child and Adult)** – An unlikely receptor under future land use. Although this scenario is highly unlikely, a future residential scenario is typically evaluated in a risk assessment for decision-making purposes. It is assumed that a hypothetical resident may be exposed to soil (by ingestion, dermal contact, and inhalation), sediment (by ingestion and dermal contact), groundwater (by ingestion, dermal contact, inhalation of volatiles, and vapor intrusion into indoor air), and surface water (by ingestion and dermal contact).

6.4.3 Central Tendency Exposure and Reasonable Maximum Exposure

Traditionally, exposures evaluated in an HHRA were based on the concept of a reasonable maximum exposure (RME) only, which is defined as "the maximum exposure that is reasonably expected to occur at a site" (USEPA, 1989). However, recent risk assessment guidance (USEPA, 1992) indicates the need to address an average case or central tendency exposure (CTE).

To provide a full characterization of potential exposure, both RME and CTE were evaluated for Site 3. The available guidance (USEPA, 1993d) concerning the evaluation of CTE is limited and at times vague. Therefore, professional judgment was exercised when defining CTE conditions for a particular receptor. Exposure factors and assumptions for the CTE are presented and discussed in Section 6.4.5.

6.4.4 Exposure Point Concentrations

The exposure point concentration (EPC), which is calculated for COPCs only, is a reasonable maximum estimate of the chemical concentration that is likely to be contacted over time by a receptor and is used to calculate estimated exposure intakes.

The following guidelines were used to calculate EPCs for soil, groundwater, surface water, and sediment at Site 3:

- If a soil, surface water, or sediment data set contained fewer than 10 samples, the EPCs for the RME and CTE cases were defined as the maximum detected concentrations.
- If a soil, surface water, or sediment data set contained 10 or more samples, 95-percent upper confidence limits (UCLs) on the arithmetic mean, based on the distribution of the data set, were

selected as EPCs for the RME and CTE cases. EPCs were calculated following USEPA's Calculating UCLs for EPCs at Hazardous Waste Sites (USEPA, 2002c) using USEPA's ProUCL software and guidance (USEPA, 2007a). In general, the concentration selected as the EPC is the value recommended by the ProUCL software, subject to final review by a statistician.

- USEPA Region 4 makes an exception to the use of the UCL as the EPC for groundwater. According to the Region 4 guidance (USEPA, 2000a), groundwater EPCs should be the arithmetic average concentrations for wells in the highly concentrated area of the plume. Using the Region 4 guidance, the EPCs for various classes of COPCs in groundwater were calculated using sample locations GPT-03-16 and GPT-03-21 through 27.

Prior to statistical analysis (e.g., distribution analyses, calculation of basic descriptive statistics and UCLs, etc.), non-detect results were assigned the value of the sample quantitation limit (SQL). Rejected values ("R" flagged during data validation) were eliminated from further consideration because they are regarded as unreliable. Estimated and biased values (flagged "J") were used at the reported values with the realization that some uncertainty is associated with the reported numerical result. When duplicate sample pairs were reported, the sample and duplicate were considered as two separate samples when determining minimum and maximum concentrations.

USEPA Region 4 has adopted a Toxicity Equivalence Factor (TEF) approach to evaluate potentially carcinogenic PAHs. These TEFs (available for several carcinogenic PAHs) are based on the relative potency of each compound relative to the toxicity of benzo(a)pyrene. The TEFs were used to convert each individual carcinogenic PAH concentration into an equivalent concentration of benzo(a)pyrene. Using individual benzo(a)pyrene equivalent concentrations, an EPC for carcinogenic PAHs was derived. If no carcinogenic PAHs were in a sample, one-half of the SQL for benzo(a)pyrene was used as the benzo(a)pyrene equivalent concentration for that sample.

The EPCs for chemicals identified as COPCs in environmental media at Site 3 are presented in Table 6-11 and the RAGS Part D Tables in Appendix D-1.

**TABLE 6-11
EXPOSURE POINT CONCENTRATIONS FOR CHEMICALS OF POTENTIAL CONCERN
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Chemical	Surface Soil (mg/kg)	Subsurface Soil (mg/kg)	Groundwater (ug/L)	Surface Water (ug/L)	Sediment (mg/kg)
Volatile Organic Compounds					
1,2,4-Trichlorobenzene	NA	NA	2.23 ⁽¹⁾	NA	NA
1,2-Dichloroethane	NA	NA	2.06 ⁽¹⁾	NA	NA
Benzene	NA	NA	2.22 ⁽¹⁾	NA	NA
cis-1,2-Dichloroethene	NA	NA	132 ⁽¹⁾	NA	NA
Methylene Chloride	NA	NA	2.58 ⁽¹⁾	NA	NA
trans-1,2-Dichloroethene	NA	NA	11.6 ⁽¹⁾	NA	NA
Trichloroethene	NA	NA	12.8 ⁽¹⁾	NA	NA
Vinyl Chloride	NA	NA	17.1 ⁽¹⁾	NA	NA
Semivolatile Organic Compounds					
Benzo(a)pyrene Equivalents	0.265 ⁽²⁾	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	NA	NA	NA	19 ⁽²⁾	NA
Inorganics					
Aluminum	NA	NA	799 ⁽¹⁾	NA	10752 ⁽³⁾
Arsenic	3.66 ⁽⁴⁾	1.17 ⁽³⁾	11.5 ⁽¹⁾	NA	7.83 ⁽³⁾
Chromium	NA	NA	3.24 ⁽¹⁾	NA	NA
Iron	7331 ⁽³⁾	2905 ⁽⁴⁾	15878 ⁽¹⁾	3680 ⁽²⁾	7435 ⁽³⁾
Lead	NA	NA	1.51 ⁽¹⁾	NA	NA
Manganese	NA	NA	137 ⁽¹⁾	98.2 ⁽²⁾	NA
Vanadium	12 ⁽³⁾	7.48 ⁽⁴⁾	5.33 ⁽¹⁾	NA	17.1 ⁽³⁾

Notes:

The exposure point concentrations (EPCs) were calculated according to USEPA's ProUCL guidance. See the RAGS PART D Table 3s in Appendix X for details concerning the EPCs.

NA - Not applicable. Not a COPC for this media.

µg/L - micrograms per liter

mg/L - milligrams per liter

1 - Arithmetic Mean Concentration

2 - Maximum Detected Concentration

3 - Student-t = mean calculation using the t test

4 - Approximate Gamma 95% UCL

6.4.5 Intake Estimation Methods and Exposure Parameters

To determine potential human health risks associated with Site 3, an estimate of chemical intake was made in accordance with current USEPA guidance. Exposure parameters and exposure concentrations were used to derive estimates of chemical intake for each exposure route, pathway, and receptor. The resulting chemical intakes were integrated with the toxicity factors discussed in Section 6.5 to develop quantitative risk estimates for potential receptors at the site. Intakes for the identified potential receptor groups were calculated using current USEPA risk assessment guidance (1989 and 2004c) and are presented in the risk assessment spreadsheets (see Appendix D-1). In accordance with current USEPA guidance, chemical intakes (and risks) were estimated for both the CTE and RME conditions. Values of exposure parameters used to quantify exposure for each receptor are presented in Tables 6-12 and 6-13 for the RME and CTE, respectively.

The following sections present the equations used to estimate chemical intakes for the exposure routes identified for quantitative evaluation. Example calculations for estimated intakes are provided in Appendix D-2. Calculations of estimated intakes for all potential receptors are included in Appendix D-1.

6.4.5.1 Exposure to COPCs in Soil/Sediment

The HHRA assumed that maintenance workers, construction/excavation workers, industrial workers, trespassers (adults and adolescents), and potential future residents may come into contact with chemicals detected in soil or sediment at the site. Soil and sediment exposure routes are incidental ingestion and dermal contact. A description of the methods and assumptions used to quantify soil and sediment exposure follows.

Incidental Ingestion of Soil/Sediment. Intakes associated with soil or sediment ingestion are estimated using the following equation (USEPA, 1989):

$$\text{Intake} = \frac{C \times IR \times FI \times EF \times ED \times CF}{BW \times AT}$$

where:

Intake	=	ingestion intake
C	=	chemical concentration in soil or sediment (mg/kg)
IR	=	soil/sediment ingestion rate (mg per day)
FI	=	fraction ingested from contaminated source (unitless)
EF	=	exposure frequency (days per year)
ED	=	exposure duration (years)
CF	=	conversion factor (1 x 10 ⁻⁶ kg/mg)
BW	=	body weight (kilograms)
AT	=	averaging time (days)
		for non-carcinogens: 365 days per year x ED
		for carcinogens: 365 days per year x 70 years

TABLE 6-12
SUMMARY OF EXPOSURE FACTORS - REASONABLE MAXIMUM EXPOSURE
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
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Exposure Route	Construction/ Excavation Worker	Site Maintenance Worker	Site Industrial Worker	Adolescent Trespasser	Adult Trespasser	Future Child Resident	Future Adult Resident
ASSUMPTIONS FOR EXPOSURE TO SOIL AND SEDIMENT							
Exposure Concentration - C_{soil}, C_{sed} (mg/kg)	Maximum or 95% UCL ⁽¹⁾						
Ingestion Rate (IR) (mg/day)	330 ⁽²⁾	100 ⁽¹⁾	50 ⁽¹⁾	100 ⁽¹⁾	50 ⁽¹⁾	200 ⁽¹⁾	100 ⁽¹⁾
Fraction Ingested (FI) (unitless)	1.0 ⁽³⁾						
Skin Surface Area (SA) (cm ² /day)	3,300 ⁽⁴⁾	3,300 ⁽⁴⁾	3,300 ⁽⁴⁾	3,250 ⁽⁵⁾	5,700 ⁽⁴⁾	2,800 ⁽⁴⁾	5,700 ⁽⁴⁾
Soil-to-Skin Adherence Factor (AF) (mg/cm ²)	0.3 ⁽⁴⁾	0.2 ⁽⁴⁾	0.2 ⁽⁴⁾	0.4 ⁽⁴⁾	0.07 ⁽⁴⁾	0.2 ⁽⁴⁾	0.07 ⁽⁴⁾
Absorption Factor (ABS) (unitless)	chemical-specific ⁽⁴⁾						
Conversion Factor (CF) (kg/mg)	1E-06						
Exposure Frequency (EF) - Soil (days/year)	250 ⁽⁶⁾	24 ⁽⁷⁾	250 ⁽¹⁾	30 ⁽⁸⁾	30 ⁽⁸⁾	350 ⁽¹⁾	350 ⁽¹⁾
Exposure Frequency (EF) - Sediment (days/year)	30 ⁽⁶⁾	24 ⁽⁷⁾	24 ⁽⁷⁾	30 ⁽⁸⁾	30 ⁽⁸⁾	30 ⁽⁸⁾	30 ⁽⁸⁾
Exposure Duration (ED) (years)	1 ⁽⁶⁾	25 ⁽¹⁾	25 ⁽¹⁾	11 ⁽⁹⁾	19 ⁽⁹⁾	6 ⁽¹⁾	24 ⁽¹⁾
Body Weight (BW) (kg)	70 ⁽¹⁾	70 ⁽¹⁾	70 ⁽¹⁾	45 ⁽¹⁰⁾	70 ⁽¹⁾	15 ⁽¹⁾	70 ⁽¹⁾
Noncarcinogenic Averaging Time (AT _n) (days)	365 ⁽³⁾	9,125 ⁽³⁾	9,125 ⁽³⁾	4,015 ⁽³⁾	6,935 ⁽³⁾	2,190 ⁽³⁾	8,760 ⁽³⁾
Carcinogenic Averaging Time (AT _c) (days)	25,550 ⁽³⁾						
ASSUMPTIONS FOR EXPOSURE TO SURFACE WATER							
Exposure Concentration - C_{sw}	Maximum ⁽¹¹⁾						
Ingestion Rate (IR) (L/hour)	0.01 ⁽¹⁰⁾	0.05 ⁽¹⁰⁾	0.01 ⁽¹⁰⁾				
Skin Surface Area (SA) (cm ² /day)	3,300 ⁽⁴⁾	3,300 ⁽⁴⁾	3,300 ⁽⁴⁾	3,250 ⁽⁵⁾	5,700 ⁽⁴⁾	2,800 ⁽⁴⁾	5,700 ⁽⁴⁾
Event Frequency (EV) (events/day)	1 ⁽⁶⁾	1 ⁽⁷⁾	1 ⁽⁶⁾				
ET (hours/day) and t_{event} (hours/event)	1 ⁽⁶⁾	1 ⁽⁷⁾	1 ⁽⁶⁾				
Exposure Frequency EF (days/year)	30 ⁽⁶⁾	24 ⁽⁷⁾	30 ⁽⁶⁾	30 ⁽⁸⁾	30 ⁽⁸⁾	30 ⁽⁸⁾	30 ⁽⁸⁾
Permeability Coefficient from Water through Skin (K_p)(cm/hour)	chemical-specific ⁽⁴⁾						
Bunge Dermal Model variables - t^* (hour/event), T (hour), and B (unitless)	chemical-specific ⁽⁴⁾						
Exposure Duration (ED) (years)	1 ⁽⁶⁾	25 ⁽¹⁾	25 ⁽¹⁾	11 ⁽⁹⁾	19 ⁽⁹⁾	6 ⁽¹⁾	24 ⁽¹⁾
Body Weight (BW) (kg)	70 ⁽¹⁾	70 ⁽¹⁾	70 ⁽¹⁾	45 ⁽¹⁰⁾	70 ⁽¹⁾	15 ⁽¹⁾	70 ⁽¹⁾
Noncarcinogenic Averaging Time (AT _n) (days)	365 ⁽³⁾	9,125 ⁽³⁾	9,125 ⁽³⁾	4,015 ⁽³⁾	6,935 ⁽³⁾	2,190 ⁽³⁾	8,760 ⁽³⁾
Carcinogenic Averaging Time (AT _c) (days)	25,550 ⁽³⁾						

**SUMMARY OF EXPOSURE FACTORS - REASONABLE MAXIMUM EXPOSURE
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ASSUMPTIONS FOR EXPOSURE TO GROUNDWATER							
Exposure Concentration - C_{gw}	Average ⁽¹⁰⁾	Average ⁽¹⁰⁾	Average ⁽¹⁰⁾	Average ⁽¹⁰⁾	Average ⁽¹⁰⁾	Average ⁽¹⁰⁾	Average ⁽¹⁰⁾
Ingestion Rate (IR) (L/day)	NA	NA	NA	NA	NA	1.5 ⁽¹²⁾	2 ⁽¹⁾
Skin Surface Area (SA) (cm ² /day)	3,300 ⁽⁴⁾	NA	NA	NA	NA	6,600 ⁽⁴⁾	18,000 ⁽⁴⁾
Exposure Time (ET) (hour/event)	4 ⁽⁶⁾	NA	NA	NA	NA	0.33 ⁽⁶⁾	0.33 ⁽⁶⁾
Event Frequency (EV) (events/day)	1 ⁽⁶⁾	NA	NA	NA	NA	1 ⁽⁶⁾	1 ⁽⁶⁾
Permeability Coefficient from Water through Skin (K_p)(cm/hour)	chemical-specific ⁽⁴⁾	NA	NA	NA	NA	chemical-specific ⁽⁴⁾	chemical-specific ⁽⁴⁾
Bunge Dermal Model variables - t^* (hour/event), T (hour), and B (unitless)	chemical-specific ⁽⁴⁾	NA	NA	NA	NA	chemical-specific ⁽⁴⁾	chemical-specific ⁽⁴⁾
Conversion Factor (CF) (L/cm ³)	1E-03	NA	NA	NA	NA	1E-03	1E-03
Exposure Frequency (EF) (days/year)	30 ⁽⁶⁾	NA	NA	NA	NA	350 ⁽¹⁾	350 ⁽¹⁾
Exposure Duration (ED) (years)	1 ⁽⁶⁾	NA	NA	NA	NA	6 ⁽¹⁾	24 ⁽¹⁾
Body Weight (BW) (kg)	70 ⁽¹⁾	NA	NA	NA	NA	15 ⁽¹⁾	70 ⁽¹⁾
Noncarcinogenic Averaging Time (AT_n) (days)	365 ⁽³⁾	NA	NA	NA	NA	2,190 ⁽³⁾	8,760 ⁽³⁾
Carcinogenic Averaging Time (AT_c) (days)	25,550 ⁽³⁾	NA	NA	NA	NA	25,550 ⁽³⁾	25,550 ⁽³⁾
ASSUMPTIONS FOR EXPOSURE VIA INHALATION OF VOCS FROM GROUNDWATER							
Inhalation Rate (IR_h) (m ³ /hour)	2.5 ⁽²⁾	NA	NA	NA	NA	NA	NA
Exposure Time (hours/day)	4 ⁽⁶⁾	NA	NA	NA	NA	NA	NA

Footnotes:

- 1 - USEPA, 2002c: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.
- 2 - USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.
- 3 - USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-89/002.
- 4 - USEPA, 2004c: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.
- 5 - Assumed 25 percent of total body surface area is exposed.
- 6 - Professional judgment. Assumes a one year construction project. Construction workers are assumed to be exposed to soil during the entire project. Exposure to groundwater, surface water, and sediment are assumed to occur for only 30 days a year.
- 7 - Assumes receptor is exposed to surface water and sediment 2 days per month.
- 8 - Assumes swimming 2-3 days per week during summer months.
- 9 - Assumes a total 30 year exposure, 11 years for an adolescent (6 to 16 years old) and the remaining 19 years for an adult.
- 10 - USEPA Region 4: Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins. May 2000.
- 11 - Less than ten samples were collected therefore the maximum detected concentration was used as the exposure point concentration.
- 12 - USEPA, 1997c: Exposure Factors Handbook. EPA/600/8-95/002FA.

TABLE 6-13

**SUMMARY OF EXPOSURE FACTORS - CENTRAL TENDENCY EXPOSURE
SITE 3 - NORTHWEST LANDFILL/BURNING PIT
NCBC, GULFPORT, MISSISSIPPI
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Exposure Route	Construction/ Excavation Worker	Site Maintenance Worker	Site Industrial Worker	Adolescent Trespasser	Adult Trespasser	Future Child Resident	Future Adult Resident
ASSUMPTIONS FOR EXPOSURE TO SOIL AND SEDIMENT							
Exposure Concentration - C_{soil} C_{sed} (mg/kg)	Maximum or 95% UCL ⁽¹⁾						
Ingestion Rate (IR) (mg/day)	165 ⁽⁶⁾	50 ⁽¹⁾	50 ⁽¹⁾	50 ⁽¹⁾	50 ⁽¹⁾	100 ⁽¹⁾	50 ⁽¹⁾
Fraction Ingested (FI) (unitless)	1.0 ⁽³⁾						
Skin Surface Area (SA) (cm ² /day)	3,300 ⁽⁴⁾	3,300 ⁽⁴⁾	3,300 ⁽⁴⁾	3,250 ⁽⁵⁾	5,700 ⁽⁴⁾	2,800 ⁽⁴⁾	5,700 ⁽⁴⁾
Soil-to-Skin Adherence Factor (AF) (mg/cm ²)	0.1 ⁽⁴⁾	0.02 ⁽⁴⁾	0.02 ⁽⁴⁾	0.04 ⁽⁴⁾	0.01 ⁽⁴⁾	0.04 ⁽⁴⁾	0.01 ⁽⁴⁾
Absorption Factor (ABS) (unitless)	chemical-specific ⁽⁴⁾						
Conversion Factor (CF) (kg/mg)	1E-06						
Exposure Frequency (EF) - Soil (days/year)	125 ⁽⁶⁾	12 ⁽⁷⁾	219 ⁽¹⁾	15 ⁽⁶⁾	15 ⁽⁶⁾	234 ⁽¹⁾	234 ⁽¹⁾
Exposure Frequency (EF) - Sediment (days/year)	15 ⁽⁶⁾	12 ⁽⁷⁾	12 ⁽⁷⁾	15 ⁽⁶⁾	15 ⁽⁶⁾	15 ⁽⁶⁾	15 ⁽⁶⁾
Exposure Duration (ED) (years)	1 ⁽⁶⁾	9 ⁽¹⁾	9 ⁽¹⁾	11 ⁽⁸⁾	19 ⁽⁸⁾	2 ⁽¹⁾	7 ⁽¹⁾
Body Weight (BW) (kg)	70 ⁽¹⁾	70 ⁽¹⁾	70 ⁽¹⁾	45 ⁽⁹⁾	70 ⁽¹⁾	15 ⁽¹⁾	70 ⁽¹⁾
Noncarcinogenic Averaging Time (AT _n) (days)	365 ⁽³⁾	9,125 ⁽³⁾	9,125 ⁽³⁾	4,015 ⁽³⁾	6,935 ⁽³⁾	730 ⁽³⁾	2,555 ⁽³⁾
Carcinogenic Averaging Time (AT _c) (days)	25,550 ⁽³⁾						
ASSUMPTIONS FOR EXPOSURE TO SURFACE WATER							
Exposure Concentration - C_{sw}	Maximum ⁽¹⁰⁾						
Ingestion Rate (IR) (L/hour)	0.01 ⁽⁹⁾	0.05 ⁽⁹⁾	0.01 ⁽⁹⁾				
Skin Surface Area (SA) (cm ² /day)	3,300 ⁽⁴⁾	3,300 ⁽⁴⁾	3,300 ⁽⁴⁾	3,250 ⁽⁵⁾	5,700 ⁽⁴⁾	2,800 ⁽⁴⁾	5,700 ⁽⁴⁾
Event Frequency (EV) (events/day)	1 ⁽⁶⁾						
ET (hours/day) and t_{event} (hours/event)	1 ⁽⁶⁾						
Exposure Frequency EF (days/year)	15 ⁽⁶⁾	12 ⁽⁷⁾	12 ⁽⁷⁾	15 ⁽⁶⁾	15 ⁽⁶⁾	15 ⁽⁶⁾	15 ⁽⁶⁾
Permeability Coefficient from Water through Skin (K_p)(cm/hour)	chemical-specific ⁽⁴⁾						
Bunge Dermal Model variables - t^* (hour/event), T (hour), and B (unitless)	chemical-specific ⁽⁴⁾						
Exposure Duration (ED) (years)	1 ⁽⁶⁾	9 ⁽¹⁾	9 ⁽¹⁾	11 ⁽⁸⁾	19 ⁽⁸⁾	2 ⁽¹⁾	7 ⁽¹⁾
Body Weight (BW) (kg)	70 ⁽¹⁾	70 ⁽¹⁾	70 ⁽¹⁾	45 ⁽⁹⁾	70 ⁽¹⁾	15 ⁽¹⁾	70 ⁽¹⁾
Noncarcinogenic Averaging Time (AT _n) (days)	365 ⁽³⁾	9,125 ⁽³⁾	9,125 ⁽³⁾	4,015 ⁽³⁾	6,935 ⁽³⁾	730 ⁽³⁾	2,555 ⁽³⁾
Carcinogenic Averaging Time (AT _c) (days)	25,550 ⁽³⁾						

**SUMMARY OF EXPOSURE FACTORS - CENTRAL TENDENCY EXPOSURE
SITE 3 - NORTHWEST LANDFILL/BURNING PIT
NCBC, GULFPORT, MISSISSIPPI
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ASSUMPTIONS FOR EXPOSURE TO GROUNDWATER							
Exposure Concentration - C _{gw}	Average ⁽⁹⁾	Average ⁽⁹⁾	Average ⁽⁹⁾	Average ⁽⁹⁾	Average ⁽⁹⁾	Average ⁽⁹⁾	Average ⁽⁹⁾
Ingestion Rate (IR) (L/day)	NA	NA	NA	NA	NA	0.66 ⁽¹¹⁾	1.4 ⁽¹⁾
Skin Surface Area (SA) (cm ² /day)	3,300 ⁽⁴⁾	NA	NA	NA	NA	6,600 ⁽⁴⁾	18,000 ⁽⁴⁾
Exposure Time (ET) (hour/event)	2 ⁽⁶⁾	NA	NA	NA	NA	0.25 ⁽⁶⁾	0.25 ⁽⁶⁾
Event Frequency (EV) (events/day)	1 ⁽⁶⁾	NA	NA	NA	NA	1 ⁽⁶⁾	1 ⁽⁶⁾
Permeability Coefficient from Water through Skin (K _p)(cm/hour)	chemical-specific ⁽⁴⁾	NA	NA	NA	NA	chemical-specific ⁽⁴⁾	chemical-specific ⁽⁴⁾
Bunge Dermal Model variables - t* (hour/event), T (hour), and B (unitless)	chemical-specific ⁽⁴⁾	NA	NA	NA	NA	chemical-specific ⁽⁴⁾	chemical-specific ⁽⁴⁾
Conversion Factor (CF) (L/cm ³)	1E-03	1E-03	NA	NA	NA	1E-03	1E-03
Exposure Frequency (EF) (days/year)	15 ⁽⁶⁾	NA	NA	NA	NA	234 ⁽¹⁾	234 ⁽¹⁾
Exposure Duration (ED) (years)	1 ⁽⁶⁾	NA	NA	NA	NA	2 ⁽¹⁾	7 ⁽¹⁾
Body Weight (BW) (kg)	70 ⁽¹⁾	NA	NA	NA	NA	15 ⁽¹⁾	70 ⁽¹⁾
Noncarcinogenic Averaging Time (AT _n) (days)	365 ⁽³⁾	NA	NA	NA	NA	730 ⁽³⁾	2,555 ⁽³⁾
Carcinogenic Averaging Time (AT _c) (days)	25,550 ⁽³⁾	NA	NA	NA	NA	25,550 ⁽³⁾	25,550 ⁽³⁾
ASSUMPTIONS FOR EXPOSURE VIA INHALATION OF VOCS FROM GROUNDWATER							
Inhalation Rate (IR _i) (m ³ /hour)	2.5 ⁽²⁾	NA	NA	NA	NA	NA	NA
Exposure Time (hours/day)	2 ⁽⁶⁾	NA	NA	NA	NA	NA	NA

Footnotes:

- 1 - USEPA, 2002c: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.
- 2 - USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.
- 3 - USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-89/002.
- 4 - USEPA, 2004c: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.
- 5 - Assumed 25 percent of total body surface area is exposed.
- 6 - Professional Judgment. Assumes one half the RME exposure.
- 7 - Assumes receptor is exposed to surface water and sediment one day per month.
- 8 - Assumes a total 30 year exposure, 11 years for an adolescent (6 to 16 years old) and the remaining 19 years for an adult.
- 9 - USEPA Region 4: Supplemental Guidance to RAGS: Region 4 Bulletins, Human Health Risk Assessment Bulletins. May 2000.
- 10 - Less than ten samples were collected therefore the maximum detected concentration was used as the exposure point concentration.
- 11 - USEPA, 1997c: Exposure Factors Handbook. EPA/600/8-95/002FA.

Incidental ingestion rates for potential receptors are based on the recommendations contained in current risk guidance for the evaluation of the CTE and RME (USEPA, 1993d). Children are assumed to ingest more soil than adults because of normal behavior such as purposely placing dirty objects in their mouth and unintentional hand-to-mouth activities. The following ingestion rates for the CTE were used to quantify risks in this HHRA: 100 milligrams (mg) per day for child residents and 50 mg per day for adult residents, adult and adolescent trespassers, industrial workers, and maintenance workers. Construction workers are expected to have higher than average soil ingestion rates (165 mg per day) because of the increased potential for soil contact typically associated with ground-intrusive activities (USEPA, 2002b). For the RME, the following ingestion rates were used to quantify risks: 200 mg per day for child residents, 100 mg per day for adult residents, adolescent trespassers, and site maintenance workers, 50 mg per day for adult trespassers and industrial workers, and 330 mg per day for construction workers. The fraction of soil ingested from the contaminated source is conservatively assumed 1.0 for both the CTE and RME.

Maintenance workers were assumed exposed to soil 12 days per year for 9 years for the CTE and 24 days per year for 25 years for the RME. Construction workers were assumed exposed to soil 250 days per year for 1 year for the RME and 125 days per year for 1 year for the CTE. Industrial workers were assumed exposed to soil 250 days per year for 25 years for the RME and 219 days per year for 9 years for the CTE. Adolescent trespassers were assumed to be exposed to soil 15 days per year for 11 years for the CTE and 30 days per year for 11 years for the RME. Adult trespassers were assumed exposed to soil 15 days per year for 19 years for the CTE and 30 days per year for 19 years for the RME. Residents were assumed exposed to soil 234 days per year for 9 years (2 years as a child plus 7 years as an adult) for the CTE and 350 days per year for 30 years (6 years as a child plus 24 years as an adult) for the RME.

For exposure to sediment, maintenance workers and industrial workers are assumed exposed 24 days per year for the RME and 12 days per year for the CTE. Adolescent trespassers are assumed exposed to sediment 30 days per year for the RME and 15 days per year for the CTE. Adult trespassers are assumed exposed to sediment 30 days per year for the RME and 15 days per year for the CTE. Construction/excavation workers and future residents are assumed exposed to sediment 30 days per year for the RME and 15 days per year for the CTE.

Adults (workers, trespassers, and residents) were assumed to weigh 70 kilograms (kg). The body weight for adolescent trespassers (ages 6 to 16) was assumed to be 45 kg, and the weight of the child resident (0 to 6 years) was assumed to be 15 kg. Exposure parameters for the soil ingestion route are summarized in Tables 6-12 and 6-13.

Dermal Absorption of Soil/Sediment. Doses for dermal contact with soil and sediment were estimated using the following equation (USEPA, 2004c):

$$DEX = \frac{C \times SA \times AF \times ABS \times EF \times ED \times CF}{BW \times AT}$$

where:

DEX	=	dermal dose (mg/kg-day)
C	=	chemical concentration in soil or sediment (mg/kg)
SA	=	skin surface area available for contact (cm ² /day)
AF	=	soil-to-skin adherence factor (mg/cm ²)
ABS	=	absorption factor (unitless)
EF	=	exposure frequency (days per year)
ED	=	exposure duration (years)
CF	=	conversion factor (1 x 10 ⁻⁶ kg/mg)
BW	=	body weight (kg)
AT	=	averaging time (days)
		for non-carcinogens: 365 days per year x ED
		for carcinogens: 365 days per year x 70 years

Exposed surface areas of the body available for dermal contact were determined for each receptor based on assumed human activities and clothing worn during exposure events. USEPA guidance (1997c and 2004c) was used to develop the default assumptions concerning the amount of skin surface area available for contact for a receptor. The skin surface areas used in risk assessment calculations and the rationale for the selection of the surface areas are as follows:

- For adolescent trespassers, 25 percent of the total surface area was assumed available for contact with soil. This skin surface area was assumed to be 3,250 square centimeters (cm²) for the RME and CTE scenarios (USEPA, 1997c).
- The head, hands, and forearms of maintenance workers, industrial workers, and excavation/construction workers were assumed to be available for contact (assuming short-sleeved shirt, long pants, and shoes). As recommended in RAGS Part E (USEPA, 2004c), this skin surface area was assumed to be 3,300 cm² for the RME and CTE scenarios. This value represents the average of the 50th percentile areas of males and females more than 18 years old.
- For adult trespassers and adult residents assumed to be exposed to soil and sediment, the exposed surface areas available for contact were the values for the adult skin surface area for exposure to soil recommended in RAGS Part E (USEPA, 2004c), 5,700 cm² for the RME and for the CTE. This skin area assumes that the head, hands, forearms, and lower legs of the adult are available for contact.
- For child residents assumed to be exposed to soil and sediment, the exposed surface areas available for contact were the values for child skin surface area for exposure to soil recommended in RAGS

Part E (USEPA, 2004c), 2,800 cm² for the RME and for the CTE. This skin area assumes that the head, hands, forearms, lower legs, and feet of the child are available for contact.

The soil-to-skin adherence factors and chemical-specific dermal absorption factors provided in RAGS Part E (USEPA, 2004c) were used to evaluate risks from exposure to soil. The following soil adherence factors were used for the RME and CTE exposure scenarios:

- Industrial and on-site workers – 0.2 mg/cm² for the RME and 0.02 mg/cm² for the CTE (Exhibit 3.5).
- Construction workers – 0.3 mg/cm² for the RME and 0.1 mg/cm² for the CTE (Exhibit 3.3).
- Adult trespassers and adult residents – 0.07 mg/cm² for the RME and 0.01 mg/cm² for the CTE. (Exhibit 3.5).
- Adolescent trespassers – 0.4 mg/cm² for the RME and 0.04 mg/cm² for the CTE. (Exhibit 3.3).
- Child residents – 0.2 mg/cm² for the RME and 0.04 mg/cm² for the CTE (Exhibit 3.5).

For the constituents identified as COPCs in soil and sediment, the following dermal absorption factors were used in this HHRA (USEPA, 2004c):

- PAHs – 0.13.
- Arsenic – 0.03.
- Other metals and volatiles – not evaluated for dermal contact with soil (RAGS Part E does not provide absorption factors for metals other than arsenic and cadmium).

The same exposure frequencies, exposure durations, and body weights previously identified for the ingestion route of exposure were used to characterize dermal contact with soil and sediment. Exposure parameters for the soil/sediment dermal absorption route are summarized in Tables 6-12 and 6-13.

6.4.5.2 Exposure to Groundwater

Future residential, construction worker, and industrial worker scenarios were developed for exposure to groundwater primarily using current risk assessment guidance (USEPA, 1989; 1993b; and 2004a). The applicable groundwater exposure frequencies, exposure durations, and body weights for residents are identical to those previously identified for soil contact.

Ingestion of Groundwater

Intakes for direct ingestion of groundwater were estimated using the following general equation (USEPA, 1989):

$$\text{Intake} = \frac{C \times IR \times EF \times ED}{BW \times AT}$$

where:

Intake	=	ingestion intake (mg/kg-day)
C	=	chemical concentration in groundwater (mg/L)
IR	=	ingestion rate (L/day)
EF	=	exposure frequency (days per year)
ED	=	exposure duration (years)
BW	=	body weight (kg)
AT	=	averaging time (days)
		for non-carcinogens: 365 days per year x ED
		for carcinogens: 365 days per year x 70 years

Water ingestion rates for the adult resident were specified as 1.4 liters per day (L/day) (CTE) and 2.0 L/day (RME). For the child resident, water ingestion rates were 0.66 L/day (CTE) and 1.5 L/day (RME).

Dermal Contact with Groundwater

The following equations were used to estimate doses resulting from dermal contact with groundwater (USEPA, 2004c):

$$\text{DAD} = \frac{\text{DA}_{\text{event}} \times \text{EV} \times \text{EF} \times \text{ED} \times \text{A}}{\text{BW} \times \text{AT}}$$

where:	DAD	=	dermal dose (mg/kg-day)
	DA _{event}	=	dose per event (mg/cm ² /event)
	EV	=	event frequency (events/day)
	EF	=	exposure frequency (days per year)
	ED	=	exposure duration (years)
	A	=	skin surface area available for contact (cm ²)
	BW	=	body weight (kg)
	AT	=	averaging time (days)
			for non-carcinogens: 365 days per year x ED
			for carcinogens: 365 days per year x 70 years

The absorbed dose per event (DA_{event}) is estimated using a non-steady-state approach for organic compounds and a traditional steady-state approach for inorganics. The following equations apply for organic chemicals:

$$\text{If } t_{\text{event}} < t^*, \text{ then: } DA_{\text{event}} = 2 \times FA \times K_p \times C \times CF \times \left(\frac{\sqrt{6 \tau t_{\text{event}}}}{\pi} \right)$$

$$\text{If } t_{\text{event}} > t^*, \text{ then: } DA_{\text{event}} = FA \times K_p \times C \times CF \times \left(\frac{t_{\text{event}}}{1+B} + 2 \tau \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right)$$

where:	t_{event}	=	duration of event (hour/event)
	t^*	=	time it takes to reach steady-state conditions (hour)
	FA	=	fraction absorbed (dimensionless) – chemical specific
	K_p	=	permeability coefficient from water through skin (cm/hour)
	C	=	concentration of chemical in surface water (mg/L)
	CF	=	conversion factor (1×10^{-3} L/cm ³)
	τ	=	lag time (hour)
	π	=	constant (unitless; equal to 3.1416)
	B	=	partitioning constant derived by Bunge Model (dimensionless)

Values for the chemical-specific parameters (t^* , K_p , τ , and B) were obtained from the current dermal guidance (USEPA, 2004c, Exhibit B-3) and are presented in Appendix D-1. If published values were not available for a particular compound, they were calculated using equations provided in the USEPA dermal guidance.

The following equation was used to estimate DA_{event} for inorganics:

$$DA_{\text{event}} = K_p \times C \times t_{\text{event}}$$

The recommended default value of 1×10^{-3} was used for inorganic chemicals, unless chemical-specific data were available in RAGS Part E.

Whole-body contact was assumed for dermal contact with groundwater for the residential scenario. A value of 18,000 cm² was used for the adult resident for both the CTE and RME scenarios (USEPA, 2004c). For the child resident, a skin surface area of 6,600 cm² was used for the CTE and RME scenarios. For excavation/construction workers exposed to groundwater, the exposed skin surface area was assumed 3,300 cm² (USEPA, 1997c). This assumes that approximately 18 percent of the total body surface area is available for contact with groundwater. The estimated exposure time (i.e., length of shower or bath) was 15 minutes for the CTE and 20 minutes for the RME. Construction/excavation workers were assumed exposed to shallow groundwater in a trench 4 hours per day for the RME and 2 hours per day for the CTE. An event frequency of one per day was assumed for the CTE and RME (residents were assumed to take one shower or bath per day).

Exposure parameters for exposure to groundwater are summarized in Tables 6-12 and 6-13.

Inhalation of Volatiles in Groundwater

Groundwater exposure may also result in chemical intake through inhalation if the water resource is used as a domestic water supply or is exposed during construction activities, and if VOCs are present in the groundwater. This exposure route is plausible for residential receptors that may be exposed while showering, bathing, washing dishes, etc., or for construction workers contacting shallow groundwater during excavation activities. Per USEPA Region 4 risk assessment protocol, it was assumed that the chemical intake resulting from a showering exposure is equivalent to the chemical intake from ingestion of 2 liters of water.

Inhalation of Volatiles via Vapor Intrusion from Groundwater into Indoor Air

Volatilization of chemicals from groundwater into indoor air may occur, thereby exposing individuals inside buildings or dwellings. Therefore, potential risks associated with chemical concentrations in indoor air because of vapor migration from impacted groundwater were evaluated for industrial workers and hypothetical future residents. The Johnson and Ettinger Vapor Intrusion Model (USEPA, 2004b) was used to determine the indoor air concentrations of chemicals present in groundwater. The model assumes that vapors of volatile chemicals are emitted from groundwater, migrate through surface and subsurface soil, through cracks in the building foundation, and accumulate in air inside buildings. The Johnson and Ettinger model assumes that residential dwellings have been constructed on the site and that the dimensions and ventilation rates of these buildings are typical of residential dwellings in the United States. The results of the vapor intrusion evaluation are presented in the uncertainty section (Section 6.7.5) due to the uncertainty associated with the EPCs generated using the Johnson and Ettinger volatilization model.

Exposure of Workers to Volatiles in a Construction/Utility Trench

Construction workers may be exposed to COPCs that have volatilized from groundwater when excavation exposes the shallow groundwater table. Construction worker exposure associated with the inhalation route was estimated in the following manner (USEPA, 1989):

$$\text{Intake}_{\text{ai}} = \frac{(C_{\text{ai}})(IR_{\text{a}})(ET)(EF)(ED)}{(BW)(AT)}$$

where: Intake_{ai} = intake of chemical "i" from air via inhalation (mg/kg/day)
 C_{ai} = concentration of chemical "i" in air (mg/m³)
 IR_a = inhalation rate (m³/hr)
 ET = exposure time (hours/day)
 EF = exposure frequency (days per year)
 ED = exposure duration (year)
 BW = body weight (kg)
 AT = averaging time (days);
 for non-carcinogens, AT = ED x 365 days per year;
 for carcinogens, AT = 70 year x 365 days per year

The same exposure frequency and exposure time used to estimate intake from dermal contact with groundwater were used to evaluate intake from inhalation of VOCs from groundwater during construction activities.

There are no well-established models available for estimating migration of volatiles from groundwater into a construction/utility trench. To estimate EPCs for air in a construction trench, this HHRA used the approach suggested by the Virginia Department of Environmental Quality (VDEQ, 2004), which is based on a combination of a vadose zone model (to estimate volatilization of gases from contaminated groundwater into a trench) and a box model (to estimate dispersion of the contaminants from the air inside the trench into the above-ground atmosphere). The VDEQ methodology is described in the following paragraphs.

The airborne concentration of a contaminant in a trench can be estimated using the following equation:

$$C_{\text{air}} = C_{\text{GW}} \times \text{VF}$$

where:

C_{air} = air concentration of contaminant in the trench ($\mu\text{g}/\text{m}^3$)
 C_{GW} = concentration of contaminant in groundwater ($\mu\text{g}/\text{L}$)
 VF = volatilization factor (L/m^3)

It is assumed that a construction project could result in an excavation of 15 feet bls or less. If the depth to groundwater at a site is less than 15 feet, the VDEQ model assumes that a worker would encounter groundwater when digging an excavation ditch or a trench. The worker would then have direct exposure to the groundwater. The worker would also be exposed to contaminants in the air inside the trench that would result from volatilization from the groundwater pooling at the bottom of the trench.

The following equation is used to calculate the volatilization factor (VF) for a trench less than 15 feet deep:

$$\text{VF} = (K_i \times A \times F \times 10^{-3} \times 10^4 \times 3,600) / (\text{ACH} \times V)$$

where:

K_i = overall mass transfer coefficient of contaminant (cm/s)
 A = area of the trench (m^2)
 F = fraction of floor through which contaminant can enter (unitless)
 10^{-3} = conversion factor (L/cm^3)
 10^4 = conversion factor (cm^2/m^2)
 3,600 = conversion factor (seconds/hour)
 ACH = air changes per hour (h^{-1}) = 360 h^{-1}
 V = volume of trench (m^3)

Studies of urban canyons suggest that if the ratio of trench width, relative to wind direction, relative to trench depth is less than or equal to one, a circulation cell or cells will be set up within the trench that limits the degree of gas exchange with the atmosphere and, based on measured ventilation rates of buildings, the air changes per hour (ACHs) are assumed to be two. Based on the ratio of trench depth to the average wind speed, if the ratio of trench width to trench depth is greater than one, the air exchange between the trench and aboveground atmosphere is not restricted, and the ACHs are assumed to be 360. The exposure assessment performed for these HHRAs assumed the width-to-trench depth ratio was greater than 1; therefore, the ACHs were set at 360.

K_i is calculated using the following equation:

$$K_i = 1 / \{ (1/k_iL) + [(RT) / (H_i k_iG)] \}$$

where:

K_i	=	overall mass transfer coefficient of containment (cm/s)
k_iL	=	liquid-phase mass transfer coefficient of i (cm/s)
R	=	ideal gas constant (atm-m ³ /mole-°K) = 8.2×10^{-5}
T	=	average system absolute temperature (°K) (Default = 298°K)
H_i	=	Henry's Law constant of i (atm-m ³ /mole)
k_iG	=	gas-phase mass transfer coefficient of i (cm/s)

The formulas for calculating k_iL and k_iG are as follows:

$$k_iL = (MWO_2/MW_i)^{0.5} \times (T/298) \times k_{L,O_2}$$

where:

k_iL	=	liquid-phase mass transfer coefficient of component i (cm/s)
MWO_2	=	molecular weight of oxygen (g/mole)
MW_i	=	molecular weight of component i (g/mole)
k_{L,O_2}	=	liquid-phase mass transfer coefficient of oxygen at 25°C (cm/s) = 0.002 cm/s

$$k_iG = (MWH_2O/MW_i)^{0.335} \times (T/298)^{1.005} \times k_{G,H_2O}$$

where:

k_iG	=	gas-phase mass transfer coefficient of component i (cm/s)
MWH_2O	=	molecular weight of water (g/mole)
k_{G,H_2O}	=	gas-phase mass transfer coefficient of water vapor at 25°C (cm/s) = 0.833 cm/s (USEPA, 1988).

Chemical properties were obtained from the Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites (USEPA, 2002b).

6.4.5.3 Exposure to Surface Water

Direct contact with surface water may occur while potential receptors are involved in work or play in Canal No. 1. Because swimming is not likely to occur in Canal No. 1, this scenario assumed that receptors are

exposed by incidental ingestion and dermal contact while wading. Ingestion of surface water was conservatively evaluated, but it is not expected to be a significant exposure pathway for the wading scenario.

Incidental Ingestion of Surface Water

Potential receptors may incidentally ingest small amounts of surface water while wading in Canal No. 1. Intakes associated with ingestion of surface water were evaluated using the following equation (USEPA, 1989):

$$\text{Intake}_{wi} = \frac{(C_{wi})(IR_w)(ET)(EF)(ED)}{(BW)(AT)}$$

where:

Intake _{wi}	=	intake of chemical "i" from water (mg/kg/day)
C _{wi}	=	concentration of chemical "i" in water (mg/L)
IR _w	=	ingestion rate for surface water (L/hour)
ET	=	exposure time for surface water (hour/day)
EF	=	exposure frequency (days per year)
ED	=	exposure duration (year)
BW	=	body weight (kg)
AT	=	averaging time (days); for non-carcinogens, AT = ED x 365 days per year; for carcinogens, AT = 70 years x 365 days per year

An ingestion rate of 0.01 liters per hour is used for adults and adolescents under CTE and RME conditions (USEPA, 2000a) and 0.05 liters per hour for children (USEPA, 2000a). Exposure times, which were based on professional judgment with consideration of anticipated activities, were specified as 1.0 hour per day for the CTE and RME. Because surface water and sediment exposure coincides, the same exposure durations and frequencies previously identified for exposure to sediment were used to evaluate inadvertent surface water ingestion. Exposure factor values for ingestion of surface water are summarized in Tables 6-12 and 6-13.

The same equations used to assess dermal exposure to groundwater were used to evaluate dermal exposure to surface water. The following skin surface areas were used for evaluating dermal exposure to surface water: 3,300 cm² was used as the exposed surface area for site maintenance workers, excavation/construction workers, and industrial workers for the CTE and RME; 3,250 cm² was used for adolescent trespassers, 2,800 cm² was used as the exposed skin surface area for child residents, and 5,700 cm² was used for adult trespassers and adult residents. The same exposure times, frequencies, and durations used to assess ingestion of surface water were used to estimate intakes for dermal exposure.

6.4.5.4 Exposures to Lead

The equations and methodology presented in the previous section cannot be used to evaluate exposure to lead because of the absence of published dose-response parameters. Exposure to lead was assessed using the latest version of USEPA's Integrated Exposure Uptake Biokinetic (IEUBK) Model for lead, (USEPA, 1994a). This model is typically used to evaluate lead exposure assuming a residential land use scenario.

Young children are considered sensitive to lead because the developing central nervous system is especially vulnerable to lead toxicity. Furthermore, young children may engage in behaviors such as eating soil or paint chips that potentially predispose them to higher exposures. The uptake of lead from ingestion tends to be higher for young children than older receptors. Rather than describe an acceptable dose level for intake of lead, USEPA and other health organizations (e.g., Centers for Disease Control) evaluate acceptable lead exposure based on blood-lead levels.

USEPA developed the IEUBK Model to estimate blood-lead level for infants and young children (under 7 years of age) based on cumulative exposures and to compare the estimated blood-lead levels to an acceptable blood lead level. This model has been validated for children and is the USEPA's recommended method for lead assessment. The model uses site-specific information to predict the geometric mean of the blood-lead concentration based on the exposure of a child or population of children to lead at the site. The model also calculates the probability that children exposed to the lead at a site will have blood-lead concentrations exceeding a health-based target level.

Health effects of concern have been determined to be associated with childhood blood-lead concentrations at 10 micrograms of lead per deciliter ($\mu\text{g}/\text{dL}$) of blood (USEPA, 1994a and 1994b). The USEPA goal is that no more than 5 percent of a measured population will have blood-levels exceeding 10 $\mu\text{g}/\text{dL}$.

As utilized in this risk assessment, the model uses lead concentrations in the environment and the rate at which a child inhales or ingests the soil to determine lead exposure. The IEUBK Model estimates how much lead enters a child's body by calculating medium-specific lead intake rates using the following equation:

$$\text{Lead Intake Rate} = \text{Media lead Concentration} * \text{Media Intake Rate}$$

The values used for media lead concentrations and media intake rates are either derived from site-specific data or standard default values established by USEPA. The media intake rates are age-specific (USEPA, 2002b).

6.5 TOXICITY ASSESSMENT

Oral and inhalation reference doses (RfDs) and cancer slope factors (CSFs) used in the HHRA for Site 3 were obtained from the following primary literature sources (USEPA, 2008):

- IRIS.
- USEPA Provisional Peer Reviewed Toxicity Values (PPRTVs) – The Office of Research and Development/National Center for Environmental Assessment (NCEA) Superfund Health Risk Technical Support Center develops PPRTVs on a chemical-specific basis when requested by USEPA's Superfund program.
- Other Toxicity Values – These sources include but are not limited to California Environmental Protection Agency (Cal EPA) toxicity values, Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels, and Annual Health Effects Assessment Summary Tables (HEAST) (USEPA, 1997b).

Although RfDs and CSFs can be found in several toxicological sources, USEPA's IRIS online database is the preferred source of toxicity values. This database is continuously updated, and values presented have been verified by USEPA. USEPA Region 9 PRG tables and Region 3 RBC tables were also used as sources of toxicity criteria when these criteria were not available from the aforementioned references. The RfDs and CSFs for the constituents selected as COPCs for Site 3 are presented in Tables 6-14 through 6-17.

6.5.1 Toxicity Criteria for Dermal Exposure

RfDs and CSFs found in literature are typically expressed as administered doses; therefore, these values are considered inappropriate for estimating the risks associated with dermal routes of exposure. Oral dose-response parameters based on administered doses must be adjusted to absorbed doses before the evaluation of estimated dermal exposure intakes is made.

TABLE 6-14
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal ⁽¹⁾	Absorbed RfD for Dermal ⁽²⁾		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds										
1,2,4-Trichlorobenzene	Chronic	1.0E-02	mg/kg/day	1	1.0E-02	mg/kg/day	Kidney	1000/1	IRIS	2/25/2008
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	Chronic	4.0E-03	mg/kg/day	1	4.0E-03	mg/kg/day	Blood	300/1	IRIS	2/25/2008
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	Chronic	1.0E-02	mg/kg/day	1	1.0E-02	mg/kg/day	Blood	3000	PPRTV	3/01/2006
Methylene Chloride	Chronic	6.0E-02	mg/kg/day	1	6.0E-02	mg/kg/day	Liver	100/1	IRIS	2/25/2008
trans-1,2-Dichloroethene	Chronic	2.0E-02	mg/kg/day	1	2.0E-02	mg/kg/day	Blood	1000/1	IRIS	2/25/2008
Trichloroethene	Chronic	5.0E-01	mg/kg/day	1	5.0E-01	mg/kg/day	Liver	NA	CA EPA	12/2002
Vinyl Chloride	Chronic	3.0E-03	mg/kg/day	1	3.0E-03	mg/kg/day	Liver	30/1	IRIS	2/25/2008
Semivolatile Organic Compounds										
Benzo(a)pyrene Equivalents	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	Chronic	2.0E-02	mg/kg/day	1	2.0E-02	mg/kg/day	Liver	1000/1	IRIS	2/25/2008
Inorganics										
Aluminum	Chronic	1.0E+00	mg/kg/day	1	1.0E+00	mg/kg/day	CNS	100	PPRTV	10/23/2006
Arsenic	Chronic	3.0E-04	mg/kg/day	1	3.0E-04	mg/kg/day	Skin, CVS	3/1	IRIS	2/25/2008
Chromium	Chronic	3.0E-03	mg/kg/day	0.025	7.5E-05	mg/kg/day	Fetotoxicity, GS, Bone	300/3	IRIS	2/25/2008
Iron	Chronic	7.0E-01	mg/kg/day	1	7.0E-01	mg/kg/day	GS	1.5	PPRTV	9/11/2006
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	Chronic	2.4E-02	mg/kg/day	0.04	9.6E-04	mg/kg/day	CNS	1/3	IRIS	2/25/2008
Thallium ⁽⁵⁾	Chronic	7.0E-05	mg/kg/day	1	7.0E-05	mg/kg/day	Liver	3000	USEPA III	10/11/2007
Vanadium	Chronic	1.0E-03	mg/kg/day	0.026	2.6E-05	mg/kg/day	Kidney	300	USEPA III	10/11/2007

Notes:

- 1 - USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
- 2 - Adjusted dermal RfD = Oral RfD x Oral Absorption Efficiency for Dermal.
- 3 - Values are for cadmium water.
- 4 - Values are for mercuric chloride.
- 5 - Weight adjustment of the IRIS value.

Definitions:

- CNS = Central Nervous System
 CVS = Cardiovascular system
 USEPA III = USEPA Region 3 RBC Table, October 11, 2007.
 GS = Gastrointestinal
 IRIS = Integrated Risk Information System
 NA = Not Applicable
 PPRTV - Provisional Peer Review Toxicity Value
 CA EPA = California Environmental Protection Agency
 RID = Reference Dose

**TABLE 6-15
NON-CANCER TOXICITY DATA -- INHALATION
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD ⁽¹⁾		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds									
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	Chronic	2.5E+00	mg/m ³	7.0E-01	(mg/kg/day)	NA	NA	USEPA III	10/11/2007
Benzene	Chronic	3.0E-02	mg/m ³	8.6E-03	(mg/kg/day)	Blood	300/1	IRIS	2/25/2008
Chloromethane	Chronic	0.09	mg/m ³	2.6E-02	(mg/kg/day)	CNS	1000/1	IRIS	2/25/2008
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	Chronic	1.1E+00	mg/m ³	3.0E-01	(mg/kg/day)	Liver	NA	USEPA III	10/11/2007
trans-1,2-Dichloroethene	Chronic	6.0E-02	mg/m ³	1.7E-02	(mg/kg/day)	Blood	3000	PPRTV	3/1/2006
Trichloroethene	Chronic	6.0E-01	mg/m ³	1.7E-01	(mg/kg/day)	Liver	NA	CA EPA	12/2002
Vinyl Chloride	Chronic	1.0E-01	mg/m ³	2.9E-02	(mg/kg/day)	Liver	30/1	IRIS	2/25/2008
Semivolatile Organic Compounds									
Benzo(a)pyrene Equivalents	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics									
Aluminum	Chronic	5.0E-03	mg/m ³	1.4E-03	(mg/kg/day)	CNS	300	PPRTV	10/23/2006
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	Chronic	1.0E-04	mg/m ³	2.9E-05	(mg/kg/day)	Lungs	300/1	IRIS	2/25/2008
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	Chronic	5.0E-05	mg/m ³	1.4E-05	(mg/kg/day)	CNS	1000/1	IRIS	2/25/2008
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

1 - Extrapolated RfD = RfC *20m³/day / 70 kg

Definitions:

CNS = Central Nervous System
 USEPA III = USEPA Region 3 RBC Table, April 6, 2007.
 HEAST= Health Effects Assessment Summary Tables
 IRIS = Integrated Risk Information System
 NA = Not Applicable
 PPRTV - Provisional Peer Review Toxicity Value
 CA EPA = California Environmental Protection Agency
 RfD = Reference Dose

**TABLE 6-16
CANCER TOXICITY DATA -- ORAL/DERMAL
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal ⁽¹⁾	Absorbed Cancer Slope Factor for Dermal ⁽²⁾		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds								
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	D	IRIS	2/25/2008
1,2-Dichloroethane	9.1E-02	(mg/kg/day) ⁻¹	1	9.1E-02	(mg/kg/day) ⁻¹	B2	IRIS	2/25/2008
Benzene	5.5E-02	(mg/kg/day) ⁻¹	1	5.5E-02	(mg/kg/day) ⁻¹	A	IRIS	2/25/2008
Chloromethane	NA	NA	NA	NA	NA	D	IRIS	2/25/2008
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	D	IRIS	2/25/2008
Methylene Chloride	7.5E-03	(mg/kg/day) ⁻¹	1	7.5E-03	(mg/kg/day) ⁻¹	B2	IRIS	2/25/2008
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	1.3E-02	(mg/kg/day) ⁻¹	1	1.3E-02	(mg/kg/day) ⁻¹	C	CA EPA	12/2002
Vinyl Chloride (early life)	1.5E+00	(mg/kg/day) ⁻¹	1	1.5E+00	(mg/kg/day) ⁻¹	A	IRIS	2/25/2008
Vinyl Chloride (adult)	7.2E-01	(mg/kg/day) ⁻¹	1	7.2E-01	(mg/kg/day) ⁻¹	A	IRIS	2/25/2008
Semivolatile Organic Compounds								
Benzo(a)pyrene Equivalents	7.3E+00	(mg/kg/day) ⁻¹	1	7.3E+00	(mg/kg/day) ⁻¹	B2	IRIS	2/25/2008
Bis(2-ethylhexyl)phthalate	1.4E-02	(mg/kg/day) ⁻¹	1	1.4E-02	(mg/kg/day) ⁻¹	B2	IRIS	2/25/2008
Inorganics								
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	B1	IRIS	2/25/2008
Iron	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	D	IRIS	2/25/2008
Lead	NA	NA	NA	NA	NA	B2	IRIS	2/25/2008
Manganese	NA	NA	NA	NA	NA	D	IRIS	2/25/2008
Thallium	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

- 1 - U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
- 2 - Adjusted cancer slope factor for dermal =
Oral cancer slope factor / Oral Absorption Efficiency for Dermal.

EPA Group:

- A - Human carcinogen.
- B1 - Probable human carcinogen - indicates that limited human data are available.
- B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans .
- C - Possible human carcinogen.
- D - Not classifiable as a human carcinogen.
- E - Evidence of noncarcinogenicity.

USEPA(1) = Draft Trichloroethylene Health Risk Assessment: Synthesis and Characterization, August 2001.

USEPA(2) = USEPA, Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons, July 1993, EPA/600/R-93/089.

IRIS = Integrated Risk Information System.

NA = Not Available.

CA EPA = California Environmental Protection Agency

**TABLE 6-17
CANCER TOXICITY DATA -- INHALATION
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

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Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor ⁽¹⁾		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds							
1,2,4-Trichlorobenzene	NA	NA	NA	NA	D	IRIS	2/25/2008
1,2-Dichloroethane	2.6E-05	(ug/m ³) ⁻¹	9.1E-02	(mg/kg/day) ⁻¹	B2	IRIS	2/25/2008
Benzene	7.8E-06	(ug/m ³) ⁻¹	2.7E-02	(mg/kg/day) ⁻¹	A	IRIS	2/25/2008
Chloromethane	NA	NA	NA	NA	D	IRIS	2/25/2008
cis-1,2-Dichloroethene	NA	NA	NA	NA	D	IRIS	2/25/2008
Methylene Chloride	4.7E-07	(ug/m ³) ⁻¹	1.6E-03	(mg/kg/day) ⁻¹	B2	IRIS	2/25/2008
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	2.0E-03	(mg/m3)-1	7.0E-03	(mg/kg/day)-1	C	CA EPA	12/2002
Vinyl Chloride (early life)	8.8E-06	(ug/m ³) ⁻¹	3.1E-02	(mg/kg/day) ⁻¹	A	IRIS	2/25/2008
Vinyl Chloride (adult)	4.4E-06	(ug/m ³) ⁻¹	1.5E-02	(mg/kg/day) ⁻¹	A	IRIS	2/25/2008
Semivolatile Organic Compounds							
Benzo(a)pyrene Equivalents	8.9E-04	(ug/m ³) ⁻¹	3.1E+00	(mg/kg/day) ⁻¹	NA	USEPA III	10/11/2007
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA
Inorganics							
Aluminum	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA
Cadmium	1.8E-03	(ug/m ³) ⁻¹	6.3E+00	(mg/kg/day) ⁻¹	B1	IRIS	2/25/2008
Iron	NA	NA	NA	NA	NA	NA	NA
Chromium	1.2E-02	(ug/m ³) ⁻¹	4.2E+01	(mg/kg/day) ⁻¹	A	IRIS	2/25/2008
Lead	NA	NA	NA	NA	B2	IRIS	2/25/2008
Manganese	NA	NA	NA	NA	D	IRIS	2/25/2008
Thallium	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA

**TABLE 6-17
CANCER TOXICITY DATA -- INHALATION
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

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Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor ⁽¹⁾		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)

Notes:

1 - Inhalation CSF = Unit Risk * 70 kg / 20m³/day.

Definitions:

IRIS = Integrated Risk Information System.

NA = Not Available.

USEPA III = USEPA Region 3 RBC Table, April 6, 2007.

USEPA(1) = Draft Trichloroethylene Health Risk Assessment: Synthesis and Characterization, August 2001.

CA EPA = California Environmental Protection Agency

EPA Group:

A - Human carcinogen.

B1 - Probable human carcinogen - indicates that limited human data are available.

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans .

C - Possible human carcinogen.

D - Not classifiable as a human carcinogen.

E - Evidence of noncarcinogenicity.

The adjustment from administered to absorbed dose was made using chemical-specific absorption efficiencies published in available guidance (i.e., USEPA, 2004c [the primary reference], IRIS, ATSDR toxicological profiles, etc.) and the following equations:

$$CSF_{\text{dermal}} = (CSF_{\text{oral}})/(ABS_{\text{GI}})$$

where: ABS_{GI} = absorption efficiency in the gastrointestinal tract

Absorption efficiencies used in the risk assessments reflect USEPA's current dermal assessment guidance (2004c).

6.5.2 Toxicity Criteria for Carcinogenic Effects of PAHs

Limited toxicity values are available to evaluate the carcinogenic effects from exposure to PAHs. The most extensively studied PAH is benzo(a)pyrene, which is classified by USEPA as a probable human carcinogen. Although CSFs are available for benzo(a)pyrene, insufficient data are available to calculate CSFs for other carcinogenic PAHs. Toxic effects for these chemicals were evaluated using the concept of estimated orders of potential potency, which relates the potency of the other potentially carcinogenic PAHs to the potency of benzo(a)pyrene, as presented in current USEPA guidance (1993e). The equivalent oral and inhalation CSFs for these chemicals were derived by multiplying the CSFs for benzo(a)pyrene by the orders of potential potency.

USEPA's Guidelines for Carcinogen Risk Assessment (2005e) and Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA, 2005f) specifies the use of age-dependent adjustment factors (ADAFs) for carcinogens that act via a mutagenic mode of action. Carcinogenic PAHs are included in the group of chemicals that have been determined to act via the mutagenic mode of action. No chemical-specific ADAFs have been derived for carcinogenic PAHs; therefore, the following default ADAFs were used: 10 for ages 0 to 2, 3 for ages 2 to 16, and 1 (no adjustment) for ages 16 to 70. The ADAFs were used in evaluating exposures to carcinogenic PAHs for adolescent trespassers and hypothetical future residents.

6.5.3 Toxicity Criteria for Chromium

Toxicity criteria are available for different forms of chromium, which is considered more toxic in the hexavalent state. Because there is no evidence to support the conclusion that hexavalent chromium is present at Site 3, speciation analyses were not completed for samples collected at Site 3. However, risks

associated with this chemical were assessed by conservatively assuming that 100 percent of the chromium detected in an environmental medium is present in the hexavalent state.

6.5.4 Toxicity Criteria for TCE

Toxicity criteria (i.e., RfDs, CSFs) for TCE are not currently published in the USEPA's IRIS database or in HEAST. Toxicity values for TCE developed by the NCEA and Cal EPA are currently presented in the Region 9 PRG tables. As per Navy policy, the Cal EPA values (Cal EPA, 2002) were used to estimate risks for TCE in this risk assessment. The uncertainty associated with the use of Cal EPA toxicity values relative to current USEPA NCEA values is discussed in Section 6.7.4.4.

6.6 RISK CHARACTERIZATION

The baseline HHRA evaluated potential health risks associated with human exposure to chemicals present at Site 3. Quantitative risk estimates were based on the conservative assumption that an individual is exposed to multiple COPCs by multiple exposure pathways. In accordance with USEPA guidance, chemical- and pathway-specific risks were summed to provide estimates of total risk for a given receptor. Risk estimates were developed by integrating the chemical intake levels with chemical-specific toxicity factors. Risk assessment calculations are contained in Appendix D-1, and example calculations are provided in Appendix D-2.

Incremental Lifetime Cancer Risk (ILCR) estimates were generated for each COPC using estimated exposure intakes and published CSFs, as follows:

$$\text{ILCR} = \text{Estimated Exposure Intake} \times \text{CSF}$$

An ILCR of 1×10^{-6} indicates that the exposed receptor has a one-in-one-million chance of developing cancer under the defined exposure scenario. Alternatively, such a risk may be interpreted as representing one additional case of cancer in an exposed population of one million people.

Non-carcinogenic risks are assessed using the concept of HQs and hazard indices (HIs). The HQ for a COPC is the ratio of the estimated intake to the RfD, as follows:

$$\text{HQ} = (\text{Estimated Exposure Intake}) / (\text{RfD})$$

An HI for a given exposure route is generated by summing the individual HQs for all COPCs. The HI is not a mathematical prediction of the severity of toxic effects and is therefore not a true risk. It is simply a numerical indicator of the possibility of the occurrence of non-carcinogenic (threshold) effects.

6.6.1 Comparison of Quantitative Risk Estimates to Benchmarks

To interpret the quantitative risks and to aid risk managers in determining the need for remediation at a site, quantitative risk estimates were compared to typical benchmarks. The cumulative risk benchmark for the State of Mississippi is the 1×10^{-6} risk level. Therefore, individual or cumulative ILCRs greater than 1×10^{-6} are considered to be "unacceptable" by MDEQ.

An HI exceeding unity (1.0) indicates that there may be potential non-carcinogenic health risks associated with exposure. If an HI exceeds unity, target organ effects associated with exposure to COPCs are segregated (and the HI is calculated on a target organ/target effect basis). Only those chemicals that affect the same target organ(s) or exhibit similar critical effect(s) are regarded as truly additive. Consequently, it may be possible for a cumulative HI to exceed 1.0, but no adverse health effects are anticipated if the COPCs do not affect the same target organ or exhibit the same critical effect. Individual target organ HIs for all receptors are presented in the RAGS Part D tables (Table 9s) included in Appendix D-1.

6.6.2 Risk Assessment Results

The baseline HHRA conducted for Site 3 evaluated the risks potentially incurred by maintenance workers, industrial workers, construction/excavation workers, adult and adolescent trespassers, and hypothetical future residents. All potential receptors were evaluated for exposure to COPCs in soil, surface water, and sediment. Construction/excavation workers, industrial workers, and residents were also evaluated for exposure to groundwater. Both RME and CTE exposure scenarios were evaluated. Tables 6-18 and 6-19 contain a summary of the estimated risks for Site 3 for the RME and CTE, respectively. Detailed calculations of chemical-specific risks for Site 3 are included in Appendix D-1. The following sections discuss the results of the risk characterization.

6.6.2.1 Carcinogenic Risks - RME

Quantitative estimates of carcinogenic effects are presented in the form of ILCRs. The target risk benchmark for carcinogenic effects, as defined by the MDEQ, is 1×10^{-6} . Estimated ILCRs for Site 3 are discussed in the following subsections. The carcinogenic risks calculated for the RME case are summarized in Table 6-18.

ILCRs for the construction/excavation worker, maintenance worker, adolescent trespasser, and adult trespasser were less than the MDEQ's risk management benchmark (1×10^{-6}).

TABLE 6-18
SUMMARY OF CANCER RISKS AND HAZARD INDICES
REASONABLE MAXIMUM EXPOSURES
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Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks > 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁵ and ≤ 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁶ and ≤ 10 ⁻⁵	Hazard Index	Chemicals Contributing to an HI > 1	
Construction Workers	Surface Soil	Incidental Ingestion	3E-07	--	--	--	0.1	--	
		Dermal Contact	6E-08	--	--	--	0.004	--	
		Total	4E-07	--	--	--	0.1	--	
	Subsurface Soil	Incidental Ingestion	8E-08	--	--	--	0.05	--	
		Dermal Contact	7E-09	--	--	--	0.001	--	
		Total	9E-08	--	--	--	0.05	--	
	Groundwater	Dermal Contact	2E-08	--	--	--	0.01	--	
		Inhalation	4E-09	--	--	--	0.0008	--	
		Total	3E-08	--	--	--	0.01	--	
	Surface Water	Incidental Ingestion	4E-11	--	--	--	0.0001	--	
		Dermal Contact	3E-09	--	--	--	0.001	--	
		Total	3E-09	--	--	--	0.001	--	
	Sediment	Incidental Ingestion	6E-08	--	--	--	0.03	--	
		Dermal Contact	6E-09	--	--	--	0.0009	--	
		Total	7E-08	--	--	--	0.03	--	
Total All Media			6E-07				0.2		
Site Maintenance Workers	Surface Soil	Incidental Ingestion	2E-07	--	--	--	0.003	--	
		Dermal Contact	9E-08	--	--	--	0.0002	--	
		Total	3E-07	--	--	--	0.003	--	
	Subsurface Soil	Incidental Ingestion	6E-08	--	--	--	0.001	--	
		Dermal Contact	1E-08	--	--	--	0.00007	--	
		Total	7E-08	--	--	--	0.002	--	
	Surface Water	Incidental Ingestion	9E-10	--	--	--	0.00010	--	
		Dermal Contact	7E-08	--	--	--	0.0010	--	
		Total	7E-08	--	--	--	0.001	--	
	Sediment	Incidental Ingestion	4E-07	--	--	--	0.006	--	
		Dermal Contact	8E-08	--	--	--	0.0005	--	
		Total	5E-07	--	--	--	0.007	--	
	Total All Media			1E-06				0.01	
	Site Industrial Workers	Surface Soil	Incidental Ingestion	3E-06	--	--	Arsenic	0.03	--
			Dermal Contact	1E-06	--	--	--	0.002	--
Total			4E-06	--	--	Arsenic	0.04	--	
Subsurface Soil		Incidental Ingestion	6E-07	--	--	--	0.02	--	
		Dermal Contact	1E-07	--	--	--	0.0008	--	
		Total	7E-07	--	--	--	0.02	--	
Surface Water		Incidental Ingestion	9E-10	--	--	--	0.00010	--	
		Dermal Contact	7E-08	--	--	--	0.0010	--	
		Total	7E-08	--	--	--	0.001	--	
Sediment		Incidental Ingestion	2E-07	--	--	--	0.003	--	
		Dermal Contact	8E-08	--	--	--	0.0005	--	
		Total	3E-07	--	--	--	0.004	--	
Total All Media			5E-06				0.06		

TABLE 6-18
SUMMARY OF CANCER RISKS AND HAZARD INDICES
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Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks > 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁵ and ≤ 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁶ and ≤ 10 ⁻⁵	Hazard Index	Chemicals Contributing to an HI > 1
Adolescent Trespassers	Surface Soil	Incidental Ingestion	3E-07	--	--	--	0.006	--
		Dermal Contact	8E-08	--	--	--	0.0004	--
		Total	4E-07	--	--	--	0.007	--
	Subsurface Soil	Incidental Ingestion	5E-08	--	--	--	0.003	--
		Dermal Contact	1E-08	--	--	--	0.0001	--
		Total	6E-08	--	--	--	0.003	--
	Surface Water	Incidental Ingestion	4E-09	--	--	--	0.0009	--
		Dermal Contact	6E-08	--	--	--	0.002	--
		Total	6E-08	--	--	--	0.003	--
	Sediment	Incidental Ingestion	3E-07	--	--	--	0.01	--
		Dermal Contact	7E-08	--	--	--	0.0009	--
		Total	4E-07	--	--	--	0.01	--
Total All Media			9E-07				0.03	
Adult Trespassers	Surface Soil	Incidental Ingestion	2E-07	--	--	--	0.004	--
		Dermal Contact	5E-08	--	--	--	0.0002	--
		Total	3E-07	--	--	--	0.004	--
	Subsurface Soil	Incidental Ingestion	6E-08	--	--	--	0.002	--
		Dermal Contact	7E-09	--	--	--	0.00005	--
		Total	6E-08	--	--	--	0.002	--
	Surface Water	Incidental Ingestion	8E-10	--	--	--	0.0001	--
		Dermal Contact	1E-07	--	--	--	0.002	--
		Total	1E-07	--	--	--	0.002	--
	Sediment	Incidental Ingestion	4E-07	--	--	--	0.008	--
		Dermal Contact	4E-08	--	--	--	0.0004	--
		Total	4E-07	--	--	--	0.008	--
Total All Media			9E-07				0.02	
Lifelong Trespassers (Adolescent and Adult)	Surface Soil	Incidental Ingestion	6E-07	--	--	--	NA	--
		Dermal Contact	1E-07	--	--	--	NA	--
		Total	7E-07	--	--	--	NA	--
	Subsurface Soil	Incidental Ingestion	1E-07	--	--	--	NA	--
		Dermal Contact	2E-08	--	--	--	NA	--
		Total	1E-07	--	--	--	NA	--
	Surface Water	Incidental Ingestion	5E-09	--	--	--	NA	--
		Dermal Contact	2E-07	--	--	--	NA	--
		Total	2E-07	--	--	--	NA	--
	Sediment	Incidental Ingestion	7E-07	--	--	--	NA	--
		Dermal Contact	1E-07	--	--	--	NA	--
		Total	8E-07	--	--	--	NA	--
Total All Media			2E-06				NA	

TABLE 6-18
SUMMARY OF CANCER RISKS AND HAZARD INDICES
REASONABLE MAXIMUM EXPOSURES
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Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks > 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁵ and ≤ 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁶ and ≤ 10 ⁻⁵	Hazard Index	Chemicals Contributing to an HI > 1
Child Residents	Surface Soil	Incidental Ingestion	2E-05	--	--	cPAHs, Arsenic	0.4	--
		Dermal Contact	5E-06	--	--	cPAHs	0.01	--
		Total	2E-05	--	--	cPAHs, Arsenic	0.5	--
	Subsurface Soil	Incidental Ingestion	6E-07	--	--	--	0.2	--
		Dermal Contact	5E-08	--	--	--	0.001	--
		Total	7E-07	--	--	--	0.2	--
	Groundwater	Ingestion	4E-04	Vinyl Chloride	Arsenic	1,2-Dichloroethane	9	Arsenic, Iron
		Dermal Contact	4E-06	--	--	Vinyl Chloride	0.2	--
		Inhalation	2E-04	Vinyl Chloride	--	1,2-Dichloroethane	2	--
		Total	6E-04	Vinyl Chloride	Arsenic	1,2-Dichloroethane, Benzene, Trichloroethene	11	cis-1,2-Dichloroethene, Arsenic, Iron
	Surface Water	Incidental Ingestion	6E-09	--	--	--	0.003	--
		Dermal Contact	8E-08	--	--	--	0.005	--
		Total	8E-08	--	--	--	0.008	--
	Sediment	Incidental Ingestion	1E-06	--	--	--	0.07	--
		Dermal Contact	9E-08	--	--	--	0.002	--
		Total	1E-06	--	--	--	0.07	--
	Total All Media			6E-04				12
Adult Residents	Surface Soil	Incidental Ingestion	4E-06	--	--	cPAHs, Arsenic	0.05	--
		Dermal Contact	1E-06	--	--	--	0.002	--
		Total	5E-06	--	--	cPAHs, Arsenic	0.05	--
	Subsurface Soil	Incidental Ingestion	3E-07	--	--	--	0.02	--
		Dermal Contact	4E-08	--	--	--	0.0003	--
		Total	4E-07	--	--	--	0.02	--
	Groundwater	Ingestion	4E-04	Arsenic, Vinyl Chloride	--	1,2-Dichloroethane, Trichloroethene	3	--
		Dermal Contact	1E-05	--	--	Vinyl Chloride	0.09	--
		Inhalation	2E-04	Vinyl Chloride	--	1,2-Dichloroethane, Trichloroethene	0.6	--
		Total	7E-04	Arsenic, Vinyl Chloride	--	1,2-Dichloroethane, Benzene, Trichloroethene	3	--
	Surface Water	Incidental Ingestion	1E-09	--	--	--	0.0001	--
		Dermal Contact	1E-07	--	--	--	0.002	--
		Total	1E-07	--	--	--	0.002	--
	Sediment	Incidental Ingestion	5E-07	--	--	--	0.008	--
		Dermal Contact	6E-08	--	--	--	0.0004	--
		Total	5E-07	--	--	--	0.008	--
	Total All Media			7E-04				3

TABLE 6-18
SUMMARY OF CANCER RISKS AND HAZARD INDICES
REASONABLE MAXIMUM EXPOSURES
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Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks > 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁵ and ≤ 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁶ and ≤ 10 ⁻⁵	Hazard Index	Chemicals Contributing to an HI > 1
Lifelong Residents (Child and Adult)	Surface Soil	Incidental Ingestion	2E-05	--	--	cPAHs, Arsenic	NA	--
		Dermal Contact	6E-06	--	--	cPAHs	NA	--
		Total	3E-05	--	cPAHs	Arsenic	NA	--
	Subsurface Soil	Incidental Ingestion	1E-06	--	--	--	NA	--
		Dermal Contact	9E-08	--	--	--	NA	--
		Total	1E-06	--	--	--	NA	--
	Groundwater	Ingestion	8E-04	Arsenic, Vinyl Chloride	--	1,2-Dichloroethane, Benzene, Trichloroethene	NA	--
		Dermal Contact	1E-05	--	--	Vinyl Chloride	NA	--
		Inhalation	5E-04	Vinyl Chloride	--	1,2-Dichloroethane, Benzene, Trichloroethene	NA	--
		Total	1E-03	Arsenic, Vinyl Chloride	--	1,2-Dichloroethane, Benzene, Trichloroethene	NA	--
	Surface Water	Incidental Ingestion	7E-09	--	--	--	NA	--
		Dermal Contact	2E-07	--	--	--	NA	--
		Total	2E-07	--	--	--	NA	--
	Sediment	Incidental Ingestion	2E-06	--	--	--	NA	--
		Dermal Contact	1E-07	--	--	--	NA	--
		Total	2E-06	--	--	--	NA	--
Total All Media			1E-03				NA	

TABLE 6-19
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Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks > 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁵ and ≤ 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁶ and ≤ 10 ⁻⁵	Hazard Index	Chemicals Contributing to an HI > 1	
Construction Workers	Surface Soil	Incidental Ingestion	9E-08	--	--	--	0.03	--	
		Dermal Contact	1E-08	--	--	--	0.0006	--	
		Total	1E-07	--	--	--	0.03	--	
	Subsurface Soil	Incidental Ingestion	2E-08	--	--	--	0.01	--	
		Dermal Contact	1E-09	--	--	--	0.0002	--	
		Total	2E-08	--	--	--	0.01	--	
	Groundwater	Dermal Contact	6E-09	--	--	--	0.003	--	
		Inhalation	1E-09	--	--	--	0.0002	--	
		Total	7E-09	--	--	--	0.003	--	
	Surface Water	Incidental Ingestion	2E-11	--	--	--	0.00006	--	
		Dermal Contact	2E-09	--	--	--	0.0006	--	
		Total	2E-09	--	--	--	0.0007	--	
	Sediment	Incidental Ingestion	2E-08	--	--	--	0.006	--	
		Dermal Contact	1E-09	--	--	--	0.0002	--	
		Total	2E-08	--	--	--	0.006	--	
Total All Media			1E-07				0.1		
Site Maintenance Workers	Surface Soil	Incidental Ingestion	2E-08	--	--	--	0.0008	--	
		Dermal Contact	2E-09	--	--	--	0.00001	--	
		Total	2E-08	--	--	--	0.0008	--	
	Subsurface Soil	Incidental Ingestion	5E-09	--	--	--	0.0004	--	
		Dermal Contact	2E-10	--	--	--	0.000004	--	
		Total	6E-09	--	--	--	0.0004	--	
	Surface Water	Incidental Ingestion	2E-10	--	--	--	0.00005	--	
		Dermal Contact	1E-08	--	--	--	0.0005	--	
		Total	1E-08	--	--	--	0.0005	--	
	Sediment	Incidental Ingestion	4E-08	--	--	--	0.002	--	
		Dermal Contact	1E-09	--	--	--	0.00002	--	
		Total	4E-08	--	--	--	0.002	--	
	Total All Media			8E-08				0.003	
	Site Industrial Workers	Surface Soil	Incidental Ingestion	4E-07	--	--	--	0.01	--
			Dermal Contact	3E-08	--	--	--	0.0002	--
Total			4E-07	--	--	--	0.02	--	
Subsurface Soil		Incidental Ingestion	1E-07	--	--	--	0.007	--	
		Dermal Contact	4E-09	--	--	--	0.00007	--	
		Total	1E-07	--	--	--	0.007	--	
Surface Water		Incidental Ingestion	2E-10	--	--	--	0.00005	--	
		Dermal Contact	1E-08	--	--	--	0.0005	--	
		Total	1E-08	--	--	--	0.0005	--	
Sediment		Incidental Ingestion	2E-08	--	--	--	0.0008	--	
		Dermal Contact	1E-09	--	--	--	0.00002	--	
		Total	2E-08	--	--	--	0.0008	--	
Total All Media			6E-07				0.02		

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Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks > 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁵ and ≤ 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁶ and ≤ 10 ⁻⁵	Hazard Index	Chemicals Contributing to an HI > 1
Adolescent Trespassers	Surface Soil	Incidental Ingestion	8E-08	--	--	--	0.002	--
		Dermal Contact	8E-09	--	--	--	0.00004	--
		Total	9E-08	--	--	--	0.002	--
	Subsurface Soil	Incidental Ingestion	1E-08	--	--	--	0.0007	--
		Dermal Contact	1E-09	--	--	--	0.00001	--
		Total	1E-08	--	--	--	0.0007	--
	Surface Water	Incidental Ingestion	2E-09	--	--	--	0.0005	--
		Dermal Contact	3E-08	--	--	--	0.0009	--
		Total	3E-08	--	--	--	0.001	--
	Sediment	Incidental Ingestion	8E-08	--	--	--	0.003	--
		Dermal Contact	7E-09	--	--	--	0.00009	--
		Total	9E-08	--	--	--	0.003	--
Total All Media			2E-07				0.007	
Adult Trespassers	Surface Soil	Incidental Ingestion	4E-08	--	--	--	0.002	--
		Dermal Contact	2E-09	--	--	--	0.00002	--
		Total	4E-08	--	--	--	0.002	--
	Subsurface Soil	Incidental Ingestion	9E-09	--	--	--	0.0008	--
		Dermal Contact	3E-10	--	--	--	0.000007	--
		Total	9E-09	--	--	--	0.0008	--
	Surface Water	Incidental Ingestion	4E-10	--	--	--	0.00006	--
		Dermal Contact	5E-08	--	--	--	0.001	--
		Total	5E-08	--	--	--	0.001	--
	Sediment	Incidental Ingestion	5E-08	--	--	--	0.002	--
		Dermal Contact	7E-09	--	--	--	0.0001	--
		Total	6E-08	--	--	--	0.002	--
Total All Media			2E-07				0.006	
Lifelong Trespassers (Adolescent and Adult)	Surface Soil	Incidental Ingestion	1E-07	--	--	--	NA	--
		Dermal Contact	1E-08	--	--	--	NA	--
		Total	1E-07	--	--	--	NA	--
	Subsurface Soil	Incidental Ingestion	2E-08	--	--	--	NA	--
		Dermal Contact	1E-09	--	--	--	NA	--
		Total	2E-08	--	--	--	NA	--
	Surface Water	Incidental Ingestion	2E-09	--	--	--	NA	--
		Dermal Contact	8E-08	--	--	--	NA	--
		Total	8E-08	--	--	--	NA	--
	Sediment	Incidental Ingestion	1E-07	--	--	--	NA	--
		Dermal Contact	1E-08	--	--	--	NA	--
		Total	2E-07	--	--	--	NA	--
Total All Media			4E-07				NA	

TABLE 6-19
SUMMARY OF CANCER RISKS AND HAZARD INDICES
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Receptor	Media	Exposure Route	Cancer Risk	Chemicals with Cancer Risks > 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁵ and ≤ 10 ⁻⁴	Chemicals with Cancer Risks > 10 ⁻⁶ and ≤ 10 ⁻⁵	Hazard Index	Chemicals Contributing to an HI > 1
Child Residents	Surface Soil	Incidental Ingestion	9E-07	--	--	--	0.1	--
		Dermal Contact	6E-08	--	--	--	0.002	--
		Total	1E-06	--	--	--	0.1	--
	Subsurface Soil	Incidental Ingestion	2E-07	--	--	--	0.07	--
		Dermal Contact	7E-09	--	--	--	0.0006	--
		Total	2E-07	--	--	--	0.07	--
	Groundwater	Ingestion	3E-05	--	Vinyl Chloride	Arsenic	3	--
		Dermal Contact	8E-07	--	--	--	0.08	--
		Inhalation	2E-05	--	Vinyl Chloride	--	0.6	--
		Total	6E-05	--	Vinyl Chloride	Arsenic	3	--
	Surface Water	Incidental Ingestion	1E-09	--	--	--	0.001	--
		Dermal Contact	1E-08	--	--	--	0.002	--
		Total	1E-08	--	--	--	0.004	--
	Sediment	Incidental Ingestion	9E-08	--	--	--	0.02	--
		Dermal Contact	3E-09	--	--	--	0.0002	--
Total		9E-08	--	--	--	0.02	--	
Total All Media			6E-05				4	
Adult Residents	Surface Soil	Incidental Ingestion	3E-07	--	--	--	0.02	--
		Dermal Contact	2E-08	--	--	--	0.0002	--
		Total	4E-07	--	--	--	0.02	--
	Subsurface Soil	Incidental Ingestion	8E-08	--	--	--	0.007	--
		Dermal Contact	3E-09	--	--	--	0.00006	--
		Total	8E-08	--	--	--	0.007	--
	Groundwater	Ingestion	6E-05	--	Vinyl Chloride, Arsenic	--	1	--
		Dermal Contact	2E-06	--	--	--	0.05	--
		Inhalation	3E-05	--	Vinyl Chloride	--	0.3	--
		Total	9E-05	--	Vinyl Chloride, Arsenic	--	2	--
	Surface Water	Incidental Ingestion	2E-10	--	--	--	0.00006	--
		Dermal Contact	2E-08	--	--	--	0.001	--
		Total	2E-08	--	--	--	0.001	--
	Sediment	Incidental Ingestion	3E-08	--	--	--	0.002	--
		Dermal Contact	1E-09	--	--	--	0.00003	--
Total		4E-08	--	--	--	0.002	--	
Total All Media			9E-05				2	
Lifelong Residents (Child and Adult)	Surface Soil	Incidental Ingestion	1E-06	--	--	--	NA	--
		Dermal Contact	8E-08	--	--	--	NA	--
		Total	1E-06	--	--	--	NA	--
	Subsurface Soil	Incidental Ingestion	3E-07	--	--	--	NA	--
		Dermal Contact	1E-08	--	--	--	NA	--
		Total	3E-07	--	--	--	NA	--
	Groundwater	Ingestion	9E-05	--	Vinyl Chloride, Arsenic	--	NA	--
		Dermal Contact	3E-06	--	--	Vinyl Chloride	NA	--
		Inhalation	5E-05	--	Vinyl Chloride	--	NA	--
		Total	1E-04	--	Vinyl Chloride, Arsenic	--	NA	--
	Surface Water	Incidental Ingestion	1E-09	--	--	--	NA	--
		Dermal Contact	3E-08	--	--	--	NA	--
		Total	3E-08	--	--	--	NA	--
	Sediment	Incidental Ingestion	1E-07	--	--	--	NA	--
		Dermal Contact	4E-09	--	--	--	NA	--
Total		1E-07	--	--	--	NA	--	
Total All Media			1E-04				NA	

Total ILCRs for hypothetical future residents (adult + child = 1×10^{-3}), lifelong trespassers (adult + child = 2×10^{-6}), and industrial workers (5×10^{-6}) exceed the MDEQ goal for cumulative site risk (1×10^{-6}). The elevated residential risk is primarily due to exposure to arsenic and volatiles (vinyl chloride, benzene, 1,2-DCE, TCE) in groundwater. ILCRs developed separately for adult and adolescent trespassers and medium-specific ILCRs for lifelong trespassers do not exceed the MDEQ target risk of 1×10^{-6} . Arsenic in soils/sediment is the primary contributor to the ILCRs developed for the trespasser and the industrial worker.

The chemical-specific risks are presented in the RAGS Part D tables in Appendix D-1

6.6.2.2 Non-Carcinogenic Effects - RME

Quantitative estimates of non-carcinogenic (toxic) effects are presented in the form of HQs and HIs. As discussed above, the risk benchmark for HQs and HIs (calculated on a target organ-specific basis) is 1 (USEPA, 1989). Estimated HQs and HIs for Site 3 are discussed below.

Cumulative HIs for maintenance workers, industrial workers, construction/excavation workers, adult trespassers, and adolescent trespassers under the RME scenario were less than unity (1), indicating that no toxic effects are anticipated for these receptors under the defined exposure conditions.

Cumulative HIs for the future adult and child residents were 3 and 12, respectively. Major contributors to the residential HIs were cis-1,2-DCE, iron, and arsenic in groundwater. Risk estimates calculated for ingestion exceed those calculated for the dermal and inhalation routes of exposure.

The HIs for exposure to soil, surface water, and sediment were less than unity for all receptors.

6.6.3 CTE Evaluation

As discussed in Section 6.4.3, an evaluation of potential risks associated with the CTE scenario is included to provide a measure of the central or average case exposure. Summaries of estimated risks for the CTE scenarios are presented in Table 6-19.

6.6.3.1 Carcinogenic Risks - CTE

ILCRs for construction/excavation workers, maintenance workers, industrial workers, and all trespassers (adult, child, and lifelong) were less than the MDEQ goal for cumulative site risk (1.0×10^{-6}).

Total ILCRs for hypothetical future residents (adult + child = 1×10^{-4}) exceed the MDEQ goal for cumulative site risk (1×10^{-6}). The elevated residential risk is primarily due to exposure to arsenic and vinyl chloride in groundwater.

6.6.3.2 Non-Carcinogenic Effects - CTE

Target organ-specific HIs for construction/excavation workers, maintenance workers, industrial workers, adolescent trespassers, and adult trespassers under the CTE scenario were less than unity (1), indicating that no toxic effects are anticipated for these receptors under the CTE exposure conditions. In addition, for hypothetical future residents, all HIs for individual target organs are less than or equal to 1, also indicating that no toxic effects are anticipated for these receptors under the CTE.

6.6.3.3 Risks for Lead

Lead was identified as a COPC in groundwater. The maximum detected concentration of lead in groundwater (19.4 $\mu\text{g/L}$) exceeded the 15 $\mu\text{g/L}$ Federal Action Level promulgated under the Safe Drinking Water Act and the MDEQ TRG.

Hypothetical residential exposures to lead in groundwater were evaluated using the most recent version of the IEUBK lead model (USEPA, 1994a). As recommended by the IEUBK Model, the average lead concentration of 18.4 mg/kg in surface soil was used as the EPC. The maximum detected lead concentration (19.4 $\mu\text{g/L}$) was used as the EPC for groundwater. Default values were used for the remainder of the model input parameters. IEUBK Model outputs are included in Appendix D.3. The lead concentrations of 18.4 mg/kg in surface soil and 19.4 $\mu\text{g/L}$ in groundwater result in 0.5 percent of hypothetical child residents having a blood-lead level greater than 10 $\mu\text{g/dL}$ and result in a geometric mean blood-lead level of 2.9 $\mu\text{g/dL}$. These results are within the USEPA goal as described in the 1994 Office of Solid Waste and Emergency Response (OSWER) Directive of no more than 5 percent of children with blood-lead levels exceeding 10 $\mu\text{g/dL}$.

6.7 UNCERTAINTY ANALYSIS

The baseline HHRA for Site 3 was performed in accordance with current USEPA guidance. However, there are varying degrees of uncertainty associated with the baseline HHRA. This section presents a brief summary of uncertainties inherent in the risk assessment and includes a discussion of how they may affect the quantitative risk estimates and conclusions of the risk analysis.

6.7.1 General Uncertainty in Risk Assessment

Uncertainty in the selection of COPCs is related to the current status of the predictive databases, the grouping of samples, and the procedures used to include or exclude constituents as COPCs. Uncertainty associated with the exposure assessment includes the values used as input variables for a given intake route or scenario, the assumptions made to determine EPCs, and the predictions regarding future land use and population characteristics. Uncertainty in the toxicity assessment includes the quality of the existing toxicity data needed to support dose-response relationships and the weight of evidence used to determine the carcinogenicity of COPCs. Uncertainty in risk characterization includes that associated with exposure to multiple chemicals and the cumulative uncertainty from combining conservative assumptions made in earlier steps of the risk assessment process.

Whereas there are various sources of uncertainty, the direction of uncertainty can be influenced by the assumptions made throughout the risk assessment, including selection of COPCs and selection of values for dose-response relationships. To account for uncertainties in the development of a risk assessment, conservative estimates are made to ensure that the particular assumptions made are protective of sensitive subpopulations and maximum exposed individuals. Therefore, throughout the entire risk assessment, assumptions that consider safety factors are made so that the final calculated risks are overestimated, and consequentially, very conservative.

The major sources of uncertainty associated with this risk assessment are discussed next.

6.7.2 Uncertainty in Selection of COPCs

A minor amount of uncertainty is associated with the selection of COPCs that may affect the numerical risk estimates presented in the risk assessment. The most significant issues related to uncertainty in COPC selection are the existing database (i.e., the use of validated or unvalidated sample results), inclusion of chemicals potentially attributable to background, screening levels used, exclusion of historical data from the risk assessment, and absence of screening levels for a few chemicals detected in the site media. A brief discussion of each of these issues is provided in the remainder of this section.

6.7.2.1 Existing Databases

The data used in the risk assessment for Site 3 were obtained from samples collected as part of the field efforts performed by Tetra Tech in 2006 and 2007. No historical data were used for risk assessment purposes. All analytical data were validated according to the methodologies specified in the Work Plan (Tetra Tech, 2007). The qualification of data during the formal data validation process is not expected to

compromise the results of the HHRA. Analytical data qualified as estimated were utilized, even though the reported concentrations or sample-specific quantitation limits may be somewhat imprecise. The use of estimated data adds to the uncertainty associated with the risk assessment. However, the associated uncertainty is expected to be negligible compared to the other uncertainties inherent in the risk evaluation process (i.e., uncertainties with land uses, exposure scenarios, toxicological criteria, etc.). Analytical data qualified for blank contamination were used in the baseline risk assessment. When determining exposure concentrations via statistical procedures, chemicals not detected were conservatively assumed present at concentrations equal to the sample-specific quantitation limits. Analytical results for some chemicals qualified "R", unreliable, were not used in the risk assessment.

6.7.2.2 Exclusion of Historical Data from the Risk Assessment

Data collected from the most recent sampling events were used to evaluate potential risks for Site 3. Minimal sampling had previously been conducted at Site 3.

6.7.2.3 Chemicals Potentially Attributable to Background

No chemicals were eliminated as COPCs solely based on comparisons to background concentrations. This is an important consideration when interpreting the results of the HHRA for Site 3 because several metals (i.e., arsenic and iron) were identified as risk drivers for groundwater. Arsenic was detected in 10 of 24 groundwater samples. As indicated previously, some of the sample concentrations of arsenic in soil and groundwater are also within naturally occurring ranges in Mississippi and in the United States. The inclusion of some metals in the quantitative risk evaluation is likely to overestimate the risks for the site.

6.7.2.4 COPC Screening Levels

The use of risk-based screening levels for soil and groundwater based on conservative residential land use scenarios corresponding to an ILCR of 10^{-6} and HI of 0.1 should make certain that the significant contributors to risk from a site are evaluated. The elimination of chemicals present at concentrations that correspond to ILCRs less than 10^{-6} and HIs less than 0.1 should not affect the final conclusions of the risk assessment because these chemicals are not expected to cause a potential health concern at the concentrations detected.

6.7.2.5 Absence of COPC Screening Levels

Because of the lack of toxicity criteria, USEPA Region 9 PRGs and MDEQ Tier 1 TRGs are not available for calcium, magnesium, sodium, and potassium. This may lead to a slight underestimation of potential risks. However, these inorganics are essential nutrients, commonly detected in environmental media.

Risk-based screening levels are also currently not available for several constituents detected at Site 3 (e.g., benzo(g,h,i)perylene, phenanthrene, alpha- and gamma-chlordane, delta-BHC, Endosulfan II, Endosulfan Sulfate, and Endrin Aldehyde). Therefore, screening levels available for surrogate chemicals were used as screening levels for these constituents. In the COPC selection for Site 3, the screening level for chlordane was used as a surrogate for alpha- and gamma-chlordane, endosulfan was used as a surrogate for endosulfan II and endosulfan sulfate, and endrin was used as a surrogate for endrin aldehyde. The use of these surrogates may increase the uncertainty in the risk assessment. The direction of bias cannot be determined.

6.7.3 Uncertainty in the Exposure Assessment

Uncertainty in the exposure assessment arises because of the methods used to calculate EPCs, the determination of land use conditions, the selection of receptors and scenarios, and the selection of exposure parameters. Each of these is discussed below.

6.7.3.1 Uncertainty in the Elimination of Exposure Routes/Pathways

Potential risks were evaluated for all environmental media sampled at Site 3. Surface water and sediment were evaluated for ingestion and dermal contact. Inhalation of volatiles from surface water and sediment was not evaluated because potential risks from inhalation are expected to be minimal for these media. In addition, predictive models are currently not available for these scenarios. The omission of these exposure pathways/routes may result in an underestimation of total risks for the site, but the underestimation is expected to be minimal when compared to risks for other media and exposure routes.

6.7.3.2 Exposure Point Concentrations

Uncertainty is associated with the use of the 95 percent UCL on the mean concentration as the EPC. As a result of using the 95 percent UCL, the estimations of potential risk are most likely to be overestimated because this is a representation of the upper limit that potential receptors would be exposed to over the entire exposure period. In some cases (i.e., surface water and sediment), the maximum concentration was used as the EPC because the data set contained less than 10 samples. The maximum

concentration was also used when the UCL was greater than the maximum concentration. The use of the maximum concentration as the EPC tends to overestimate potential risks because receptors are assumed exposed continuously to the maximum concentration for the entire exposure period, which is unlikely. Uncertainty is also introduced when non-detects are assigned a value of the quantitation limit when calculating the EPC. This may either overestimate or underestimate the risks to potential receptors.

6.7.3.3 Land Use

Uncertainty and conservatism may be introduced into the risk assessment when estimated risks are not based on current land use patterns. The risks calculated in this HHRA are based on current and projected land use at NCBC. Site 3 is currently used as a fairway for Pine Bayou Golf Course, and the site is expected to continue to be used for this purpose in the future. Access to the site is not restricted, and adolescents have the potential to play on the site. For this reason, recreational users/trespassers (adolescent and adult) were evaluated in the risk assessment and were assumed exposed 15 days per year. Future child and adult residents are not receptors under current or expected future land use and are included only to provide an indication of potential risks if the area was developed for residential use. Much of the uncertainty in this risk assessment is related to groundwater usage (the elevated risks calculated for Site 3 are mainly due to exposure to groundwater). The risk assessment assumes that groundwater is used as a source of domestic drinking water. However, the groundwater is not currently used for this purpose, and the Navy does not intend that groundwater at the site would be used a sources of potable water in the future.

6.7.3.4 Exposure Parameters

Each exposure factor selected for use in the risk assessment contains some associated uncertainty. Generally, exposure factors are based on surveys of physiological and lifestyle profiles across the United States. The attributes and activities studied in these surveys generally have a broad distribution. To avoid underestimation of exposure, USEPA guidelines (e.g., USEPA, 1991b) for the RME receptor were used, if applicable, which generally specify the use of the 95th percentile for most parameters. Therefore, the selected exposure factors for the RME receptor represent the upper bound of the observed or expected practices that are characteristic of the majority of the population. Because USEPA does not provide values for exposure factors for some receptors/pathways, professional judgment was used to determine some values. When using professional judgment, an effort was made to be reasonably conservative. However, the use of professional judgment adds uncertainty to the risk assessment.

Generally, uncertainty can be assessed for many assumptions made in determining factors for calculating exposures and intakes. Many of these parameters were determined from the statistical analyses of human population characteristics. Often, the database used to summarize a particular exposure parameter (i.e., body weight) is quite large. Consequently, the values chosen for such variables in the RME scenario have low uncertainty. For many parameters for which limited information exists (e.g., dermal absorption), greater uncertainty exists. For example, current USEPA guidance (USEPA, 2004c) does not provide dermal absorption factors for exposure to most metals (except arsenic and cadmium) and VOCs in soil. Therefore, risks for dermal contact with soil were not evaluated for metals other than arsenic and cadmium. Consequently, risks from exposure to soil may be underestimated by omitting metals and VOCs from the dermal risk assessment.

6.7.3.5 Uncertainty Associated with the Johnson and Ettinger Model

As discussed in Section 6.4.5.2, exposures of hypothetical residents to COPCs that may migrate from groundwater into indoor air were evaluated with USEPA's Johnson and Ettinger volatilization model (USEPA, 2004b). The results of the vapor intrusion evaluation are not included in the quantitative risk assessment presented in Section 6.6.2 because of the uncertainty associated with the air concentrations generated using the Johnson and Ettinger model. Results of the evaluation and uncertainties associated with the risks are presented in Table 6-20 (and Appendix D-1) and discussed in the following paragraphs.

The model results indicated that HIs for hypothetical future child and adult residents exposed to COPCs assumed to migrate from shallow zone groundwater through building foundations into indoor air are less than unity on a target organ basis, indicating that adverse non-carcinogenic effects are not anticipated for these receptors under the defined exposure conditions. The total (child + adult) ILCR for hypothetical lifelong residents (2×10^{-5}) exposed to COPCs migrating from groundwater through building foundations into indoor air is greater than the MDEQ goal for total site risk (1×10^{-6}). Vinyl chloride accounted for 99 percent of the total indoor inhalation risk based on a maximum groundwater concentration of 150 $\mu\text{g/L}$.

HIs and ILCRs for industrial workers would be expected to be within acceptable levels because these receptors would be exposed to volatiles in indoor air on a less frequent basis than residential receptors. In addition, industrial facilities are typically larger than residential housing units and have larger air exchange rates, which would result in lower indoor air concentrations.

TABLE 6-20

SUMMARY OF CANCER RISKS AND HAZARD INDICES
VAPOR INTRUSION MODELING
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Chemical	Cancer Risk	Hazard Index
Benzene	5E-07	0.005
Chloromethane	NA	0.003
cis-1,2-Dichloroethene	NA	0.1
Trichloroethene	1E-06	0.002
Vinyl Chloride	2E-05	0.06
Total	3E-05	0.2

NA - No toxicity criteria available.

The results of the vapor intrusion modeling are subject to the following sources of uncertainty:

- Site-specific parameters were used in the model whenever possible. For example, site-specific values were used for depth to the water table and soil type. Model default values for soil bulk density and soil porosity were found to be within the range of values measured at the site and were used in model calculations. Site-specific values for building dimensions, soil-building pressure differential, seam crack width, and air exchange rates were not available. Therefore, model default values were used for these parameters. Model default values were also used for residential dwelling dimensions based on owner-occupied and rental single-family detached residences in the United States. The use of model default values tends to increase the uncertainty in the calculated risks. The direction of the uncertainty is not known, although the model default values are generally conservative and tend to overestimate air concentrations. The default model air exchange rate (0.45 per hour) was used to evaluate residential risks. As discussed in the model guidance, this air exchange rate was based on typical residential building dimensions and ventilation rates.
- The default building parameters for the Johnson and Ettinger model assume that the dimensions of buildings and ventilation rates are typical of residential dwellings in the United States. These include an air exchange rate of 0.45 per hour and residential building dimensions of 961 centimeters (cm) long by 961 cm wide by 488 cm high (approximately 16,000 cubic feet).
- The model assumes an infinite source and does not take into account transformation processes such as biodegradation, which increased the conservatism of this assessment.

6.7.3.6 Uncertainty Associated with the VDEQ Model for Exposure to Vapors in a Trench

As discussed in Section 6.4.5.2, exposure of construction workers to vapors in a trench was evaluated by a vadose zone model recommended by VDEQ to estimate volatilization of gases from contaminated groundwater into a trench. Site-specific parameters such as groundwater concentrations were used in the model, if possible. However, it was necessary to use model default values for most of the input parameters. The use of model default values tends to increase the uncertainty in the calculated risks. The direction of the uncertainty was not known. One of most sensitive parameters, in terms of potential risk, is the air-exchange rate in the trench, which was based on assumed trench dimensions (i.e., the ratio of trench width to depth). The risk assessment assumed that air exchange between the trench and aboveground atmosphere was not restricted (as opposed to a confined space) and may tend to underestimate risks. However, the model only gives the user two choices regarding the value of ACH, a very confined space, which tends to greatly overestimate air concentrations in the trench, or a less restricted space, which results in lower air concentrations. The difference in vapor concentrations in a

trench based on the two different ACHs is approximately two to three orders of magnitude. A detailed discussion of determination of the ACH is presented in Section 6.4.5.2.

6.7.3.7 Uncertainty Associated with the Use of the IEUBK Lead Model

The results of the IEUBK modeling are subject to uncertainty associated with the blood-lead goal of 10 µg/dL. The 10 µg/dL value is a goal designated by USEPA (2005e) as a level of concern to protect sensitive subpopulations (neonates, infants, and young children). This value is assumed to provide protection of adults and the developing fetus as well. However, the 10 µg/dL level is most likely an overly conservative target for an adult receptor. The Occupational Safety and Health Administration (OSHA) and the California Code of Regulations (CCR) consider 40 µg/dL as the level at which an adult worker's blood-lead level is "safe." Above this level, an adult worker must be removed from his/her job and cannot return until his/her blood-lead level is less than 40 µg/dL. OSHA has developed guidelines specifically for lead at construction sites based on unique exposure possibilities (OSHA, 2003). The CCR Title 8 § 1532.1 (Lead in Construction Standard) is consistent with the OSHA guidelines with respect to the target blood-lead level of 40 µg/dL.

6.7.4 Uncertainty in the Toxicological Evaluation

Uncertainties associated with the toxicity assessment (determination of RfDs and CSFs and use of available criteria) are presented in this section.

6.7.4.1 Derivation of Toxicity Criteria

Uncertainty associated with the toxicity assessment is associated with hazard assessment and dose-response evaluations for the COPCs. The hazard assessment deals with characterizing the nature and strength of the evidence of causation or the likelihood that a chemical that induces adverse effects in animals will also induce adverse effects in humans. Hazard assessment of carcinogenicity is evaluated as a weight-of-evidence determination using USEPA methods. Positive animal cancer test data suggest that humans contain tissue(s) that may manifest a carcinogenic response; however, the animal data cannot necessarily be used to predict the target tissue in humans. In the hazard assessment of non-cancer effects, however, positive animal data often suggest the nature of the effects (i.e., the target tissues and type of effects) anticipated in humans.

Uncertainty in hazard assessment arises from the nature and quality of the animal and human data. Uncertainty is reduced when similar effects are observed across species, strain, sex, and exposure route; the magnitude of the response is clearly dose related; pharmacokinetic data indicate a similar fate in

humans and animals; postulated mechanisms of toxicity are similar for humans and animals; and the chemical of concern is structurally similar to other chemicals for which toxicity is more completely characterized.

Uncertainty in the dose-response evaluation includes the determination of a CSF for the carcinogenic assessment and derivation of an RfD or reference concentration (RfC) for the non-carcinogenic assessment. Uncertainty is introduced from interspecies (animal-to-human) extrapolation, which in the absence of quantitative pharmacokinetic or mechanistic data, is usually based on consideration of interspecies differences in basal metabolic rate. Uncertainty also results from intraspecies variation. Most toxicity experiments are performed with animals that are very similar in age and genotype, so intragroup biological variation is minimal, but the human population of concern may reflect a great deal of heterogeneity including unusual sensitivity or tolerance to the COPC. Even toxicity data from human occupational exposures reflect a bias because only those individuals sufficiently healthy to attend work regularly (the "healthy worker effect") and those not unusually sensitive to the chemical are likely to be occupationally exposed. Finally, uncertainty arises from the quality of the key study from which the quantitative estimate is derived and the database. For cancer effects, the uncertainty associated with dose-response factors is mitigated by assuming the 95 percent upper bound for the CSF. Another source of uncertainty in carcinogenic assessment is the method by which data from high doses in animal studies are extrapolated to the dose range expected for environmentally exposed humans. The linearized multistage model, which is used in nearly all quantitative estimations of human risk from animal data, is based on a non-threshold assumption of carcinogenesis. Evidence suggests, however, that epigenetic carcinogens, as well as many genotoxic carcinogens, have a threshold below which they are non-carcinogenic. Therefore, the use of the linearized multistage model is conservative for chemicals that exhibit a threshold for carcinogenicity.

For non-cancer effects, additional uncertainty factors may be applied in the derivation of the RfD or RfC to mitigate poor quality of the key study or gaps in the database. Additional uncertainty for non-cancer effects arises from the use of an effect level in the estimation of an RfD or RfC because this estimation is predicated on the assumption of a threshold below which adverse effects are not expected. Therefore, an uncertainty factor is usually applied to estimate a no-effect level. Additional uncertainty arises in estimation of an RfD or RfC for chronic exposure from subchronic data. Unless empirical data indicate that effects do not worsen with increasing duration of exposure, an additional uncertainty factor is applied to the no-effect level in the subchronic study. Uncertainty in the derivation of RfDs is mitigated by the use of uncertainty and modifying factors that normally range between 3 and 10. The resulting combination of uncertainty and modifying factors may reach 1,000 or more.

The derivation of dermal RfDs and CSFs from oral values may cause uncertainty. This is particularly the case when chemical-specific gastrointestinal absorption rates are not available in the literature or when only qualitative statements regarding absorption are available.

6.7.4.2 Uncertainty Associated with Evaluation of the Dermal Exposure Pathway

According to RAGS Part E (USEPA, 2004c), risks from dermal absorption from soil are to be quantitatively evaluated for arsenic, cadmium, chlordane, 2,4-dichlorophenoxyacetic acid, DDT, TCDD (and other dioxins), PAHs, PCBs, pentachlorophenol, and SVOCs because of the limited guidance available to estimate dermal absorption factors for other constituents. Therefore, the dermal route of exposure was evaluated quantitatively for these chemicals only. Risks for dermal exposure to metals (other than arsenic and cadmium) and VOCs identified as COPCs for soil or sediment were not quantified in the risk assessment. Consequently, potential risks may be underestimated by excluding these constituents from the dermal risk assessment calculations. The uncertainty is reduced somewhat by the fact that no VOCs were identified as COPCs for soil or sediment at Site 3.

Dermal risks were calculated using an USEPA model presented in RAGS Part E (USEPA, 2004c), which according to the guidance, tends to overestimate intakes and risks for dermal contact for some chemicals (e.g., PAHs, PCBs, and dioxins). Appendices A and B of RAGS Part E discuss the uncertainties in the permeability coefficients for these chemicals and the limitations of the dermal absorption model when evaluating chemicals.

6.7.4.3 Uncertainty Associated with Evaluation of Arsenic

Arsenic is a primary risk driver for exposure to groundwater at Site 3. There is uncertainty associated with the evaluation of arsenic as a carcinogen. Although the more restrictive basis for evaluating risk associated with exposure to arsenic is to assume it is a carcinogen, carcinogenic effects are not the primary health effects expected to be manifested on exposure to arsenic. Scientific information indicates that humans are capable of metabolizing arsenic to expedite its elimination from the body (ATSDR, 1997). Specifically, the body methylates the arsenic to form monomethyl arsenic and dimethyl arsenic. A limited capacity exists for the body to methylate arsenic, but this limit is generally reached when the body's intake of arsenic exceeds approximately 500 micrograms (μg) per day. Its elimination from the body obviously mitigates the possibility for arsenic to manifest carcinogenic effects. Therefore, evaluating arsenic as a non-carcinogen would be more appropriate. However, arsenic was conservatively evaluated as a carcinogen in this risk assessment. Consequently, risks for this chemical are probably overestimated to some degree.

The maximum estimated concentration of arsenic in groundwater at the site was 287 µg/L. Assuming that a receptor ingests 2 liters of water per day, the maximum exposure to this concentration corresponds to an approximate intake of 574 µg of arsenic per day. Although some humans may be more sensitive to arsenic, in that they are “poor methylators”, the average exposure concentration for the site is most likely orders of magnitude less than the maximum concentration for the site and well within the normal limit of metabolic saturation, and is most likely less than levels that would trigger responses in even sensitive individuals.

In addition to the uncertainty associated with the metabolism of arsenic, there is also uncertainty associated with the bioavailability of arsenic. The risks estimates calculated for arsenic as based on the assumption that 100 percent of the arsenic that enters the body is bioavailable. However, the toxicity studies on which RfDs and CSFs for metals are based do not account for the characteristics of a metal in soil or the limitations that these characteristics place on the absorption of the metal. Several recent studies on the bioavailability of arsenic (Ruby, V. et al., 1999) indicate that the bioavailability of arsenic in various soil types ranges from 8 to 28 percent. Based on these studies, it is possible that the risks calculated for arsenic in soil could be overestimated by as much as one order of magnitude.

6.7.4.4 Uncertainty Associated with Toxicity Criteria for TCE

As noted above, toxicity criteria (i.e., RfDs, CSFs) for TCE are not currently published in USEPA's IRIS database or in HEAST. The toxicity criteria developed by Cal EPA (USEPA, 2002) were used for TCE in this risk assessment. However, USEPA published draft toxicity values for TCE in an earlier technical document (USEPA, 2001a). The draft toxicity criteria are currently undergoing peer review. A range of CSFs (0.02 to 0.4 mg/kg/day⁻¹), as opposed to a single recommended value, is presented in the recent guidance. The draft CSFs are 2 to 30 times higher than the Cal EPA CSF (0.013 mg/kg/day⁻¹). The draft oral RfD is 0.0004 mg/kg/day compared to the Cal EPA RfD of 0.5 mg/kg/day. TCE was identified as a COPC for groundwater. Risks estimates for exposure to TCE in groundwater were within acceptable ranges using the Cal EPA toxicity values and would be within acceptable levels if the draft USEPA criteria had been used in the calculations. Therefore, use of the Cal EPA CSFs and RfDs does not affect the results and conclusions of the risk assessment.

6.7.5 Uncertainty in the Risk Characterization

Uncertainty in risk characterization results primarily from assumptions made regarding additivity of effects from exposure to multiple COPCs from various exposure routes. High uncertainty exists when summing

cancer risks for several substances across different exposure pathways. This assumes that each substance has a similar effect and/or mode of action. Often compounds affect different organs, have different mechanisms of action, and differ in their fate in the body, so additivity may not be an appropriate assumption. However, the assumption of additivity was made to provide a conservative estimate of risk.

Finally, the risk characterization does not consider antagonistic or synergistic effects. Little or no information is available to determine the potential for antagonism or synergism for the COPCs. Therefore, the uncertainty regarding antagonistic or synergistic effects is ambiguous because potential human health risks may either be underestimated or overestimated.

6.8 REMEDIAL GOAL OPTIONS

RGOs were developed for those media with ILCRs greater than 1×10^{-6} and total HIs greater than 1.0. RGOs are derived for the COCs that contribute significantly to the cancer risk and/or HI for each exposure pathway in a land use scenario for a receptor group. Chemicals were not considered as significant contributors to risk and therefore were not included as COCs if their individual carcinogenic risk contribution was less than 1×10^{-6} or their non-carcinogenic HQ was less than 0.1. As discussed in Section 6.6.2, HIs for children exposed to cis-1,2-DCE, arsenic, and iron in groundwater exceeded the acceptable level of 1. ILCRs for child, adult, and lifelong residents exposed to 1,2-DCA, benzene, TCE, vinyl chloride, and arsenic in groundwater exceeded MDEQ target risk of 1×10^{-6} , consequently RGOs were developed for these receptors and chemicals. RGOs for Site 3 were developed according to guidance provided in the Region 4 Human Health Risk Assessment Bulletins (USEPA, 2000a) and were calculated using the following equation:

$$\text{RGO}[\text{chemical } i] = \text{EPC}[\text{chemical } i] \times \text{Target Risk} / \text{Calculated Risk}[\text{chemical } i]$$

Where:

RGO[chemical i]	=	chemical-specific remedial goal option
EPC[chemical i]	=	exposure point concentration for the chemical used in risk assessment calculations
Target Risk	=	target ILCRs for carcinogens or the target HQs for non-carcinogens
Calculated Risk[chemical i]	=	the total risk calculated for a specific chemical in the risk assessment

The RGOs were developed in accordance with USEPA Region 4 and MDEQ guidance. USEPA Region 4 guidance specifies that RGOs be developed for chemicals with target cancer risks of 1×10^{-6} , 1×10^{-5} , and 1×10^{-4} and target HQs of 0.1, 1, and 3. MDEQ guidance specifies that RGOs be developed for chemicals with a target cancer risk of 1×10^{-6} and a target HQ of 1. The chemical-specific RGOs for groundwater are presented in Table 6-21.

**TABLE 6-21
REMEDIAL GOAL OPTIONS FOR GROUNDWATER
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Chemical	USEPA Region 9 PRG ⁽¹⁾ (ug/L)	MDEQ Groundwater Criteria ⁽²⁾	Federal MCL ⁽³⁾ (ug/L)	Target Cancer Risk Level			Target Hazard Index		
				10 ⁻⁶ (ug/L)	10 ⁻⁵ (ug/L)	10 ⁻⁴ (ug/L)	0.1 (ug/L)	1 (ug/L)	3 (ug/L)
CHILD RESIDENTS									
Benzene	0.35	5	5	1.1	10.8	108	2.0	20	61
1,2-Dichloroethane	0.12	5	5	0.66	6.6	66	NA	NA	NA
cis-1,2-Dichloroethene	61	70	70	NA	NA	NA	5.1	51	153
Trichloroethene	0.028	5	5	4.5	45	454	253	2529	7586
Vinyl Chloride	0.02	2	2	0.04	0.40	4.0	1.5	15	46
Arsenic	0.045	50	10	0.08	0.81	8.1	0.31	3.1	9.4
Iron	26000 ⁽⁴⁾	11000	NA	NA	NA	NA	729	7289	21868
ADULT RESIDENTS									
Benzene	0.35	5	5	0.92	9.2	92	7.0	70	209
1,2-Dichloroethane	0.12	5	5	0.58	5.8	58	NA	NA	NA
cis-1,2-Dichloroethene	61	70	70	NA	NA	NA	17.5	175	526
Trichloroethene	0.028	5	5	3.9	39	388	865	8648	25944
Vinyl Chloride	0.02	2	2	0.03	0.35	3.5	5.4	54	162
Arsenic	0.045	50	10	0.07	0.71	7.1	1.1	11	33
LIFELONG RESIDENTS									
Benzene	0.35	5	5	0.49	4.9	49	NA	NA	NA
1,2-Dichloroethane	0.12	5	5	0.31	3.08	31	NA	NA	NA
cis-1,2-Dichloroethene	61	70	70	NA	NA	NA	NA	NA	NA
Trichloroethene	0.028	5	5	2.1	21	208	NA	NA	NA
Vinyl Chloride	0.02	2	2	0.02	0.19	1.9	NA	NA	NA
Arsenic	0.045	50	10	0.038	0.38	3.8	NA	NA	NA

Notes:

- 1 - USEPA Region IX Preliminary Remedial Goals Table, Residential, October 2004.
- 2 - Mississippi Department of Environmental Quality (MDEQ), Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites February 2002 for Unrestricted and Restricted Land Use.
- 3 - USEPA Drinking Water Standards and Health Advisories, August 2006.
- 4 - The toxicity criteria in the October 2004 PRG table is outdated. Value was updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table.

MCL = Maximum Contaminant Level.
PRG = Preliminary Remediation Goal.
NA = Not applicable.

6.9 SUMMARY AND CONCLUSIONS

Site 3, the Northwest Landfill, is a former landfill located near the intersection of 8th Street and Colby Avenue and is currently used as part of a fairway at the Pine Bayou Golf Course. The landfill was operated from 1948 until the mid-1960s. Waste material was disposed in trenches, burned daily, and then backfilled. During the time this landfill was operated, nearly all of the solid waste and some of the liquid/chemical waste generated at NCBC Gulfport was disposed at this site. Access to the site is not restricted, and adolescents can potentially play at the site. Canal No. 1 is east of the site. In reviewing the risk assessment results presented below for Site 3, it is important to note that the site is a landfill thus the presumptive remedy for the unit is waste containment.

Maintenance workers, industrial workers, construction/excavation workers, adult trespassers, adolescent trespassers, and hypothetical future residents were evaluated as potential receptors in the site-specific baseline HHRA. All receptors were evaluated for potential exposure to COPCs in surface soil, subsurface soil, surface water, and sediment. Construction/excavation workers and hypothetical future residents were also evaluated for direct contact exposure to COPCs in groundwater (e.g., dermal contact). Industrial workers and future residents were also evaluated for exposure to COPCs migrating from contaminated groundwater to the indoor air space of a hypothetical future building.

Inhalation of volatile emissions from soil and fugitive dust was evaluated qualitatively via a comparison of site data to USEPA Generic SSLs for transfers from soil to air (inhalation). Exposure was considered relatively insignificant because maximum soil concentrations for all detected chemicals were less than the inhalation SSLs, and this pathway was not quantitatively evaluated in the HHRA.

The following chemicals were identified as direct contact COPCs for quantitative risk evaluation at Site 3:

- Surface Soil – benzo(a)pyrene and benzo(a)pyrene equivalents, benzo(a)anthracene, benzo(b)fluoranthene, arsenic, iron, and vanadium.
- Subsurface soil –, arsenic, iron, and vanadium.
- Groundwater – 1,2,4-TCB, chloromethane, methylene chloride, 1,2-DCA, cis-1,2-DCE, trans-1,2-DCE, benzene, TCE, vinyl chloride, aluminum, arsenic, chromium, iron, lead, manganese, and vanadium.
- Surface water – bis(2-ethylhexyl) phthalate, iron, and manganese
- Sediment – aluminum, arsenic, iron, and vanadium.

Risk Assessment Results – Current Land Use

Under current land use, quantitative estimates of non-carcinogenic and carcinogenic risks (HIs and ILCRs, respectively) were developed for maintenance workers, industrial workers, and trespassers hypothetically exposed to COPCs in surface soil, subsurface soil, surface water, and sediment, and groundwater (industrial workers only). Total ILCRs for site maintenance workers and adolescent and adult trespassers were less than or equal to the MDEQ goal for cumulative site risk (1×10^{-6}). Total non-carcinogenic HIs for maintenance workers, industrial workers, and adolescent and adult trespassers were less than unity, indicating that adverse non-carcinogenic health effects are not expected under the conditions established in the exposure assessment.

Cancer risk estimates developed for the lifelong trespasser (adolescent + adult) and the industrial worker marginally exceeded the State of Mississippi cancer risk benchmark but did not the USEPA target risk range. The ILCR exceeded 1×10^{-6} and is primarily due to arsenic in soil. However, the arsenic concentrations likely reflect background conditions.

Risk Assessment Results – Future Land Use

Under future land use, quantitative estimates of non-carcinogenic and carcinogenic risks (HIs and ILCRs, respectively) were developed for maintenance workers, industrial workers, construction/excavation workers, trespassers, and hypothetical future residents.

Risk assessment results for maintenance workers, industrial workers, and trespassers are the same as those described above.

Total ILCRs for future construction/excavation workers were less than the MDEQ goal for cumulative site risk (1×10^{-6}). Total HIs for construction/excavation workers were less than unity, indicating that adverse non-carcinogenic health effects are not anticipated for construction worker exposure to COPCs in soil, groundwater, surface water, and sediment under the defined exposure conditions.

Cancer and non-cancer risk estimates developed for the hypothetical future resident exceeded both USEPA and State of Mississippi cancer and non-cancer risk benchmarks. The cumulative ILCR estimate is primarily due to exposure to vinyl chloride and arsenic in groundwater. The cumulative HI estimate is mainly the result of exposure to cis-1,2-DCE, vinyl chloride, and iron in groundwater, and to a lesser degree arsenic and PAHs in surface soil. In addition, maximum detected concentrations of cis-1,2-DCE, TCE, vinyl chloride, methylene chloride, and arsenic in groundwater exceeded USEPA MCLs and MDEQ TRGs. However, as discussed in Section 6.7.2, there are significant uncertainties associated with the risk estimates developed for COPCs in groundwater. Among these are that the residential land use scenario

assumes that groundwater on the site is used as a source of domestic drinking water and that site-specific soil and groundwater background data sets were not available to evaluate the extent to which metals concentrations in these environmental media may reflect background conditions. ILCRs and HIs for residential exposure to subsurface soil and surface water did not exceed USEPA or MDEQ risk benchmarks. The ILCR for sediments (2×10^{-6}) marginally exceeded the MDEQ cumulative risk benchmark.

In summary, an HHRA was performed to evaluate exposure to COPCs in surface and subsurface soil, groundwater, surface water, and sediment at Site 3, the Northwest Landfill at NCBC Gulfport. Estimated risks for site maintenance workers, construction/excavation workers, adult trespassers, and adolescent trespassers assumed to be exposed to COPCs in site media were less than or equal to USEPA and MDEQ risk benchmarks. Cancer risk estimates developed for lifelong trespassers and industrial workers exposed to soil exceed the MDEQ cumulative risk benchmark. However, it is likely that a significant amount of the arsenic (which accounts for the highest percent of the risk estimates) present is due to naturally occurring arsenic in area soil. Additionally, the industrial and lifelong trespasser exposure scenarios are extremely conservative, thus the numerical risk results for these receptors are likely overestimated. The quantitative risk evaluation also indicated that potential adverse health effects may be associated with hypothetical future residential use of groundwater and that the cancer risk estimate for the future resident exposed to soil exceeds the MDEQ cumulative cancer risk benchmark. The maximum detected concentrations of several VOCs and arsenic in groundwater exceed USEPA MCLs and MDEQ TRGs. However, there is also considerable uncertainty in the risk estimates calculated for exposure to COPCs in groundwater and soil, and the numerical risk results are likely overestimated. It is important to note that the residential land use scenario was evaluated primarily to provide information to risk managers for Site 3. The groundwater underlying and downgradient of Site 3 is not currently used as a source of drinking water, and there are no plans to develop this resource or the Site 3 area for residential purposes in the future. Residential risks estimated for other site media (subsurface soil, surface water, and sediment) did not exceed USEPA risk benchmarks.

7.0 ECOLOGICAL RISK ASSESSMENT

This ecological risk assessment was conducted to evaluate potential site-related risks to ecological receptors at Site 3. The ecological risk assessment consisted of Steps 1 through 3A of USEPA's eight-step ecological risk assessment process and was conducted in accordance with USEPA and Navy guidance (USEPA, 1997a; 2000b; 2001b; United States Navy, 1999). Steps 1 through 3A consist of the following:

- Step 1 Screening-Level Problem Formulation and Ecological Effects Evaluation
- Step 2 Screening-Level Exposure Estimate and Risk Calculation
- Step 3A Refinement of Preliminary Chemicals of Potential Concern

Section 7.1.1 describes the environmental setting at Site 3. The fate and transport characteristics of chemicals detected in soil, sediment, and surface water are provided in Section 7.1.2. The ecotoxicity of site contaminants and potential ecological receptors are described in Section 7.1.3. Section 7.1.4 describes complete exposure pathways, and Section 7.1.5 provides assessment and measurement endpoints. Sections 7.2, 7.3, and 7.4 describe the ecological effects evaluation, exposure estimates, and risk calculation, respectively. Section 7.5 describes the refinement of preliminary COPCs. Uncertainties inherent in the ecological risk assessment are discussed in Section 7.6. The summary and conclusions of the ecological risk assessment are provided in Section 7.7.

7.1 SCREENING-LEVEL PROBLEM FORMULATION

7.1.1 Environmental Setting

The former landfill and burning pit at Site 3 comprise approximately 3.5 acres of the Pine Bayou Golf Course in the northwestern portion of NCBC Gulfport. Ecological habitat at the site consists largely of mowed grass. The golf course is subjected to intensive management practices to sustain the conditions desired by golfers. Soil invertebrates undoubtedly exist there, although invertebrate populations are presumably impacted by the current and historical use of insecticides at the golf course. The lack of concealing vegetation on the golf course, combined with the relative scarcity of invertebrates due to the recurring use of insecticides, results in a habitat type that is infrequently used by wildlife. Nevertheless, various bird species forage in the fairway and rough areas, consuming invertebrates in the soil and grass as well as seeds blown in from nearby wooded areas. The grass height, being similar to that in a recently mowed lawn, is too low to provide cover for small mammals such as shrews and mice. With the

exception of invertebrates and birds, probably few receptors forage at the site during daylight hours. The site is undoubtedly traversed by some wildlife species, especially at night.

Canal No. 1 lies slightly east of the former landfill and is the primary drainage ditch for the western portion of the base. The canal conveys surface water northward where it exits the base through a culvert under 28th Street. Surface water in Canal No. 1 is typically stagnant or slow flowing. The canal at Site 3 is approximately 25 to 30 feet wide and approximately 3 to 4 feet deep. Rushes (*Juncus spp.*) occur along the edge of the canal, and slash pine, wax myrtle, and the invasive exotic Chinese tallowtree (*Sapium sebiferum*) occur slightly upslope along the canal. Fish such as bluegill (*Lepomis macrochirus*), redear sunfish (*L. microlophus*), warmouth (*L. gulosus*), largemouth bass (*Micropterus salmoides*), brown bullhead (*Ameiurus nebulosus*), gizzard shad (*Dorosoma cepedianum*), and mosquitofish (*Gambusia sp.*) were identified during previous sampling conducted in Canal No. 1 in the vicinity of Site 3 (C² Environmental Services, 1999). Wading birds such as herons and egrets forage in the canal.

Site 3 is bordered to the north by a forested area that extends north to 28th Street (see Figure 1-2). A large portion of the forested area is classified as a palustrine forested wetland; this wetland type is defined as a nontidal wetland dominated by trees, shrubs, or persistent emergent vegetation. The forested area consists largely of slash pine (*Pinus elliotii*) with scattered deciduous trees such as red maple (*Acer rubrum*), sweetbay (*Magnolia virginiana*), water tupelo (*Nyssa aquatica*), blackgum (*Nyssa biflora*), and various oaks (*Quercus spp.*). Wax myrtle (*Myrica cerifera*) is a common midstory species throughout much of the forested area, and a dense understory of woody, broad-leaved evergreen shrubs such as gallberry (*Ilex glabra* and *Ilex coriacea*) and vines such as greenbrier (*Smilax spp.*) and poison ivy (*Toxicodendron radicans*) are found there. The forested area provides favorable conditions for a diverse assemblage of plants and animals. Wildlife species expected to occur in the forested area include numerous birds, reptiles, amphibians, and mammals such as the Eastern cottontail (*Sylvilagus floridanus*), gray squirrel (*Sciurus carolinensis*), opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*).

The southern end of North Pond is located approximately 150 feet north of the former landfill (see Figure 1-2). This pond is approximately 550 feet long (north to south) and 80 to 150 feet wide and is bordered by wetland vegetation. Herons and egrets forage along the edge of the pond. Fish species in the pond are probably the same as those in Canal No. 1.

A narrow strip of trees (primarily pines) and shrubs occurs along the southern side of 8th Street, which lies south of the former landfill. Various birds and some small mammals undoubtedly forage there. Golf

Course Pond, located south of 8th Street (see Figure 1-2), is used as the water supply for the golf course irrigation system.

Most precipitation presumably infiltrates into the sandy soil at the site, but the topography of the former landfill is such that during periods of heavy rainfall, surface water runoff from most of the former landfill area flows south into a ditch on the northern side of 8th street and discharges into Canal No. 1. Surface water runoff from the northern portion of the site flows north into North Pond. Golf Course Pond south of 8th Street does not receive surface water runoff from the former landfill area (see Section 3.3).

7.1.2 Contaminant Fate and Transport

Metals, VOCs, SVOCs, pesticides, and PCBs have been detected in surface soil samples collected at the site and/or in nearby surface water and sediment samples. A detailed discussion of the fate and transport of these contaminants was presented in Section 5. The discussion below is limited to a brief review of the fate and transport of contaminants at Site 3 as related to migration pathways and ecological exposure.

The former landfill and burning pit are part of a golf course fairway, and the original contaminant sources are covered by at least 2 feet of fill dirt and a surface layer of maintained grass. As mentioned earlier, the topography is relatively flat. Because of these conditions, storm water erosion, wind erosion, and overland transport of site-related contaminants in surface soil are not contaminant transport mechanisms at Site 3. However, if surface soil is disturbed through activities such as excavation, soil could serve as a source for airborne transport of contaminants, and soil contaminants could then be transported to downwind locations. Excavation of soil could also result in the volatilization of some contaminants.

Infiltrating precipitation has resulted in the contamination of groundwater at the site. Potentiometric data indicate that groundwater at Site 3 moves primarily in an east-southeast direction toward Canal No. 1, so it is assumed that groundwater can discharge into the canal. The direction of groundwater flow probably varies to some extent, so it will be assumed that groundwater might discharge into the pond north of the site. In summary, the primary contaminant migration pathway (as related to ecological receptors) at Site 3 is infiltration of soil contaminants into groundwater and subsequent potential seepage into surface water, primarily in Canal No. 1.

7.1.2.1 VOCs

VOCs are poorly adsorbed to soil and sediment particles. Also, because they are very volatile, they typically are detected in surface water, surface soil, and sediment only at low concentrations. VOCs in

soil will dissolve in rainwater to varying degrees and can be transported overland with runoff or into groundwater. Photolysis and hydrolysis are not significant mechanisms for VOC degradation. Aerobic biodegradation in soil and groundwater is significant, however, and anaerobic degradation can occur in these media.

7.1.2.2 SVOCs

Most SVOCs detected in Site 3 surface soil were PAH compounds. PAHs are ubiquitous in the modern environment and are common constituents of coal tar, soot, vehicle exhaust, cigarette smoke, certain petroleum products, road tar, mineral oils, creosote, and many cooked foods. PAHs can also be released to the environment through natural sources such as forest fires. The fate and transport characteristics of PAHs are dependent on their molecular weights. Low molecular weight PAHs are more soluble and volatile, and therefore more mobile. They can volatilize and photolyze from soil and surface water, and they can be biodegraded. High molecular weight PAHs tend to be immobile and insoluble, binding strongly to organic matter (reducing the potential for leaching to groundwater), and they are resistant to volatilization, photolysis, and biodegradation (Eisler, 2000). Upper trophic-level organisms are exposed to PAHs primarily through their diet, but most wildlife can metabolize and excrete PAHs. Food-chain transfer and biomagnification of PAHs are expected to be minimal. PAHs can be absorbed by plants but are expected to be translocated, metabolized, and potentially photodegraded. Accumulation within plants is likely to occur only in heavily polluted locations where uptake exceeds metabolism and degradation (Edwards, 1983).

7.1.2.3 Pesticides

Organochlorine pesticides are highly persistent in the environment and tend to tightly sorb to organic matter and be immobile in most soils. Degradation of chlorinated pesticides in soil would eventually occur through volatilization, photolysis, and aerobic and anaerobic degradation. Due to the lipophilicity of organochlorine pesticides, they can bioaccumulate in animals. These compounds generally bioconcentrate in lower trophic-level organisms and can be transferred and magnified in higher trophic-level organisms.

7.1.2.4 PCBs

PCB compounds were not detected in surface soil at Site 3, but two PCBs (Aroclor-1254 and Aroclor-1260) were detected in sediment. PCBs include a variety of mixtures of individual biphenyl isomers, each consisting of two joined benzene rings and up to 10 chlorine atoms. PCBs adsorb strongly to soil particles, with adsorption generally increasing with the degree of chlorination. PCBs released into

water adsorb to sediments and other organic matter. Factors that determine the biodegradability of PCBs include the amount of chlorination, concentration, microbial population type, available nutrients, and temperature (ATSDR, 1989). PCBs can significantly bioconcentrate in animals.

7.1.2.5 Inorganics

Many metals occur naturally in soil, sediment, and surface water due primarily to chemical weathering of rocks. They are toxic to aquatic and terrestrial receptors above certain concentrations, with some metals being more toxic at lower concentrations than others. In addition, different chemical forms of metals are more toxic than others. For example, hexavalent chromium is typically more toxic than trivalent chromium, and methyl mercury is more toxic than inorganic mercury. Some metals have the potential to accumulate in biota.

7.1.3 Ecotoxicity and Potential Receptors

VOCs readily volatilize, are poorly adsorbed to soil and sediment particles, and are typically detected in surface soil and sediment only at low concentrations. VOCs do not generally bioaccumulate in ecological receptors, and their toxicity to ecological receptors is relatively low.

Few generalizations can be made about the ecotoxicity of PAHs because of the extreme variability in toxicity and physiochemical properties of PAHs. Adverse impacts to plants from PAHs, however, are rare (Eisler, 2000). In most animal species, PAHs are metabolized by a mixed-function oxidase enzyme system into intermediates that may be toxic, mutagenic, or carcinogenic to the host. Some invertebrate species cannot efficiently metabolize PAHs (Eisler, 2000), and PAHs can be chronically toxic to invertebrates, but overall, very little is known about the toxicological mechanisms of PAHs in invertebrates (Erstfeld and Snow-Ashbrook, 1999). PAHs can bind to cellular macromolecules and thereby disrupt their function in higher-level organisms such as mammals and birds. Biological macromolecules include polymers of carbohydrates (e.g., starch), amino acids (proteins), and nucleotides (e.g., DNA). The cellular functions of these polymers include structure, energy storage, energy transfer, material transport, and the storage and transmittal of genetic information. PAHs show little tendency to biomagnify in the food web (Eisler, 2000). Microbial metabolism is the major process for degradation of PAHs in soil (ATSDR, 1997).

Organochlorine pesticides are reproductive and nervous system toxins. Although these compounds were used as insecticides, they are toxic to other animals as well. The target organ for acute exposures is the nervous system, and chronic exposures can affect the liver and endocrine systems of higher animals.

Organochlorine pesticides are lipophilic and can be stored in the fat tissue of organisms such as birds and mammals. In birds of prey, they can cause reproductive failure through eggshell thinning and disruption of egg-laying and nesting cycles (Amdur et al., 1991). These pesticides were developed to control insects on crops, and as a result, they are practically non-toxic to plants.

PCBs are highly lipophilic and can bioaccumulate in animals. PCBs can accumulate in offspring through placental transfer in mammals and accumulation in bird eggs, and can accumulate in upper trophic-level animals such as piscivorous birds and mammals that feed on contaminated prey items (Eisler, 2000). In animals, the primary effect associated with PCB exposure is the induction of liver enzyme systems. These enzymes are associated with detoxification mechanisms and with the metabolism of hormones. Adverse reproductive effects observed with PCB exposure are associated with induction of the enzyme systems. The toxicity of PCBs to mammals and birds varies depending on the particular PCB and the animal species. PCBs are not water soluble and accumulate to a much greater degree in animals than in plants. Nevertheless, plant-related effects of PCB exposure can include slower growth, reduced chlorophyll content, and diminished photosynthesis (USEPA, 1999).

It is difficult to make generalizations about the toxic actions of metals because of diverse affinities for organic molecules in biologic structures, wide array of biological effects, and multiplicity of target organs and systems (Amdur et al., 1991). At the molecular level, metals can manifest toxicity in many ways, including selectively accumulating in target organs (such as the kidneys), substituting for “essential” metals, and mimicking essential substrates (Clarkson, 1983). The reactions of metals at the molecular level typically affect enzyme systems, leading to disruption of cellular transport, cellular respiration, cell division, and other physiological processes. Metal toxicity to aquatic organisms is manifested through a broad spectrum of effects that may range from a reduction in growth rate to death.

7.1.4 Complete Exposure Pathways

As mentioned earlier, the former landfill and burning pit are covered by at least 2 feet of fill dirt within a golf course fairway. Therefore, exposure to landfill-related contaminants by terrestrial ecological receptors is probably nonexistent. However, the possibility that soil has been disturbed during excavation, such as during laying pipes or other activities, cannot be ruled out. As a conservative measure, therefore, it will be assumed that the soil cover is not of uniform thickness, and the soil exposure pathway will be assumed complete. To the extent that this is true, soil invertebrates could be exposed to soil contaminants at Site 3 through ingestion and dermal contact, and the root zone of some plants (especially trees near the edge of the former landfill) might extend into contaminated soil. Exposure to soil contaminants by invertebrates and plants is probably limited to very small areas at most.

In addition, invertebrate populations are presumably impacted by the current and historical use of insecticides in the fairway overlying Site 3.

The golf course fairway covering Site 3 is intensively managed. The grass height, being similar to that in a recently mowed lawn, is too low to provide cover for small mammals such as shrews and mice. Although various bird species forage in the fairways, birds would not be significantly exposed to site-related contaminants because these contaminants are buried under the cover material. Even if small areas of site-related surface soil contamination are present, such areas would comprise only a miniscule amount of foraging habitat for wide-ranging receptors such as birds. With this in mind, the exposure pathway for terrestrial receptors such as birds, mammals, and reptiles is incomplete or negligible and insignificant.

Aquatic organisms such as fish and benthic organisms (i.e., invertebrate organisms that live on or in sediment) could be exposed to sediment and surface water contaminants through ingestion and direct contact. Higher trophic-level animals such as birds and mammals that forage in Canal No. 1 and/or the North Pond and wetlands north of Site 3 can be exposed to site-related contamination through ingestion of contaminated food items and water. These animals may also incidentally ingest contaminants in sediment while preening feathers or feeding on items to which sediment has adhered. Absorption of contaminants from the gastrointestinal tract is the primary pathway of intake for upper trophic-level receptors.

In summary, complete exposure pathways and routes of entry into biota at Site 3 consist of the following:

- Direct contact with soil, sediment, and surface water.
- Ingestion of soil, sediment, and surface water.
- Ingestion of contaminated food items by upper trophic-level animals foraging in surface water and wetlands.

7.1.5 Preliminary Assessment and Measurement Endpoints

An assessment endpoint is “an explicit expression of the environmental value that is to be protected”, and a measurement endpoint is “a measurable ecological characteristic that is related to the valued characteristic chosen as the assessment endpoint” (USEPA, 1997a). Measurement endpoints represent the assessment endpoints chosen for a site and are measures of biological effects.

USEPA Region 4 has specified that assessment endpoints for the screening-level assessment should be broad and generic. For the Site 3 screening-level assessment, the preliminary assessment endpoint is the protection of terrestrial, benthic, and aquatic biota from adverse effects of chemicals on their growth, survival, and reproduction. The preliminary measurement endpoints are chemical concentrations in surface soil, sediment, and surface water that are associated with no adverse effects on growth, survival, and reproduction of terrestrial and benthic organisms. The measurement endpoints are represented by USEPA Region 4 ESVs for surface soil and sediment.

The soil and sediment ESVs are based on conservative endpoints and sensitive ecological effects data and thus represent chemical concentrations associated with a low probability of unacceptable risks to ecological receptors. For this reason, USEPA Region 4 considers their screening values to be protective of invertebrates and plants as well as upper-level receptors such as birds and mammals. Therefore, in this screening-level ecological risk assessment, a distinction is not made between measurement endpoints associated with direct toxicity to invertebrates and plants and measurement endpoints associated with food-chain effects.

7.2 SCREENING-LEVEL ECOLOGICAL EFFECTS EVALUATION

Soil screening values used in the screening-level ecological risk assessment were USEPA Ecological Soil Screening Levels (Eco-SSLs) and ESVs established by USEPA Region 4 (USEPA, 2001b). The lowest Eco-SSL among plant, invertebrate, mammal, and avian values was used as the screening value. Eco-SSLs were preferentially used as soil screening values, but Eco-SSLs are currently available for only a few chemicals. USEPA Region 4 ESVs (USEPA, 2001b) were used as screening values for chemicals that do not have an Eco-SSL. The term "soil ESV" is generally used for brevity in this report to refer to either the Eco-SSL or the Region 4 soil ESV.

ESVs for surface water and sediment used in the screening-level ecological risk assessment were those established by USEPA Region 4 (USEPA, 2001b).

If the maximum detected concentration of a chemical in surface soil, sediment, or surface water was equal to or less than the ESV, the chemical was eliminated from further consideration for that medium. If the maximum concentration exceeded the ESV, or if a screening value was not available, the chemical was then considered an ecological COPC and was retained for further evaluation.

7.3 SCREENING-LEVEL EXPOSURE ESTIMATE

Exposure point chemical concentrations for surface soil were determined from 10 samples collected in August 2007 (see Figure 2-4). Surface soil samples were collected from a depth of 0 to 1 foot, and the term “surface soil” is used in this risk assessment to refer to samples collected from this depth because USEPA Region 4 considers 0- to 1-foot depth to be representative of surface soil. The surface soil sample locations were based on previous investigations and are believed to represent the area encompassed by the former landfill and burning pit.

Exposure point chemical concentrations for sediment and surface water were determined from 10 sediment samples and 8 surface water samples collected in October 2006. Five surface water/sediment samples were collected from Canal No. 1, two surface water/sediment samples were collected from the North Pond, and one surface water/sediment sample was collected from the Golf Course Pond south of Site 3 (see Figure 2-3). Two surface water/sediment samples were targeted for collection from the forested wetland northwest of the former landfill, but surface water was not present when the two sediment samples were collected at those locations.

7.4 SCREENING-LEVEL RISK CALCULATION

The screening-level risk calculation step compared maximum concentrations of chemicals in surface soil, sediment, and surface water to ESVs. The ratio of the maximum concentration to the ESV is called the screening HQ. Analytes with maximum concentrations less than or equal to ESVs (HQs less than or equal to 1) were not considered further, and those that exceeded ESVs (HQs greater than 1), or did not have ESVs, were retained as ecological COPCs. An HQ greater than 1 indicates that ecological receptors are potentially at risk, and further evaluation or additional data may be necessary to confirm with greater certainty whether ecological receptors are actually at risk, especially because most toxicity benchmarks are developed using conservative exposure assumptions. Chemicals retained as COPCs were evaluated in Step 3A so that risk managers can determine if further investigation is warranted.

Calcium, magnesium, potassium, and sodium were not considered COPCs because they are essential nutrients that can be tolerated by living systems even at relatively high concentrations. There have been no activities at NCBC Gulfport that have resulted in known releases of high levels of these four chemicals at Site 3.

In surface soil, one pesticide and eight inorganics were retained as COPCs because their maximum concentrations exceeded ESVs; ESVs were not available for two SVOCs, five pesticides, and one herbicide (see Table 7-1). Figure 7-1 identifies surface soil analytes that exceeded ESVs.

In surface water, one SVOC and four inorganics were retained as COPCs because their maximum concentrations exceeded ESVs; ESVs were not available for one VOC and two inorganics (see Table 7-2). Figure 7-2 identifies surface water analytes that exceeded ESVs.

In sediment, five pesticides, total Aroclors, and one inorganic were retained as COPCs because their maximum concentrations exceeded ESVs; ESVs were not available for two SVOCs, two pesticides, two Aroclors, and six inorganics (see Table 7-3). Figure 7-3 identifies sediment analytes that exceeded ESVs.

The full surface soil, sediment, and surface water data sets are presented in Appendix C

7.5 REFINEMENT OF PRELIMINARY CHEMICALS OF POTENTIAL CONCERN

At this point, the first two steps of the ecological risk assessment have been completed. The ecological risk assessment process includes a series of scientific/management decision points (SMDPs) (USEPA, 1997a). The first SMDP occurs at the end of Step 2 (Screening-Level Exposure Estimate and Risk Calculation) and requires risk managers to evaluate and approve or redirect the work up to that point and determine whether the risk assessment will continue into Step 3. However, USEPA Region 4 recognizes that most ecological risk assessments will proceed into Step 3, and facilities are encouraged to submit the results of Steps 1 through 3 as a single deliverable document (USEPA, 2000a). With this in mind, and because the screening-level ecological risk assessment indicates a potential for adverse effects, a more thorough assessment is warranted. Therefore, the risk assessment process for Site 3 will proceed to Step 3 (Baseline Risk Assessment Problem Formulation).

7.5.1 General Approach

The baseline ecological risk assessment begins with a more balanced evaluation of the conservativeness inherent in the first two steps of the risk assessment process (USEPA, 1997a; United States Navy, 1999). The initial phase of Step 3 is typically known as Step 3A and consists of a refinement of the conservative exposure assumptions to estimate more realistically potential risks to plants, invertebrates, and wildlife receptors.

TABLE 7-1
SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
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Analyte	Frequency of Detection	Range of Detected Concentrations	Sample of Maximum Detected Concentration	Range of Non-detects ⁽¹⁾	Ecological Screening Value	Maximum Hazard Quotient ⁽²⁾	COPC (Yes/No) ⁽³⁾
Volatile Organic Compounds (µg/kg)							
Chloroform	1/10	0.61	03SS0801	5 - 7.5	1.0	0.6	No
Semivolatile Organic Compounds (µg/kg)							
Benzo(a)anthracene	3/10	84 - 170	03SS0901	360 - 450	1100	0.2	No
Benzo(a)pyrene	3/10	170 - 210	03SS0101	360 - 450	1100	0.2	No
Benzo(b)fluoranthene	3/10	270 - 360	03SS0101	360 - 450	1100	0.3	No
Benzo(g,h,i)perylene	1/10	100	03SS0901	360 - 450	1100	0.1	No
Benzo(k)fluoranthene	3/10	200 - 240	03SS0101/03SS0901	360 - 450	1100	0.2	No
Bis(2-ethylhexyl)phthalate	6/10	52 - 280	03SS0901	370 - 450	NA	NA	Yes
Caprolactam	2/10	170 - 260	03SS0301	360 - 430	NA	NA	Yes
Chrysene	3/10	150 - 230	03SS0901	360 - 450	1100	0.2	No
Fluoranthene	3/10	73 - 160	03SS0101	360 - 450	29000	0.01	No
Pyrene	3/10	140 - 370	03SS0101	360 - 450	1100	0.3	No
Pesticides/PCBs (µg/kg)							
4,4'-DDD	4/10	0.73 - 3.3	03SS1001	0.56 - 0.72	21	0.2	No
4,4'-DDE	4/10	0.73 - 4.9	03SS0101	0.56 - 0.72	21	0.2	No
4,4'-DDT	5/10	0.29 - 17	03SS1001	0.58 - 0.72	21	0.8	No
Aldrin	2/10	0.31 - 0.66	03SS1001	0.28 - 0.36	2.5	0.3	No
Alpha-BHC	4/10	0.22 - 0.68	03SS0701	0.28 - 0.36	2.5	0.3	No
Beta-BHC	3/10	0.11 - 0.19	03SS0201	0.29 - 0.36	1.0	0.2	No
Gamma-BHC (Lindane)	5/10	0.45 - 1.2	03SS0301	0.29 - 0.32	0.05	24.0	Yes
Alpha-Chlordane	7/10	0.14 - 26	03SS0901	0.29 - 0.36	NA	NA	Yes
Gamma-Chlordane	6/10	0.098 - 14	03SS0901	0.28 - 0.36	NA	NA	Yes
Dieldrin	6/10	0.17 - 3.7	03SS0701	0.58 - 0.72	4.9	0.8	No
Endosulfan II	4/10	0.28 - 1.5	03SS0901	0.56 - 0.72	NA	NA	Yes
Endosulfan Sulfate	1/10	2.1	03SS0901	0.56 - 0.72	NA	NA	Yes
Endrin	1/10	0.62	03SS1001	0.56 - 0.72	1.0	0.6	No
Endrin Aldehyde	2/10	0.18 - 0.45	03SS0101	0.56 - 0.72	1.0 ⁽⁴⁾	0.5	No
Heptachlor Epoxide	3/10	0.23 - 0.47	03SS0101	0.28 - 0.36	NA	NA	Yes
Herbicides (µg/kg)							
Dinoseb	1/10	14	03SS1001	13 - 17	NA	NA	Yes

TABLE 7-1
SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SURFACE SOIL
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Analyte	Frequency of Detection	Range of Detected Concentrations	Sample of Maximum Detected Concentration	Range of Non-detects ⁽¹⁾	Ecological Screening Value	Maximum Hazard Quotient ⁽²⁾	COPC (Yes/No) ⁽³⁾
Inorganics (mg/kg)							
Aluminum	10/10	2670 - 7300	03SS0701	-	50	146	Yes
Antimony	1/10	1.2	03SS0901	0.99 - 1.2	0.27	4.4	Yes
Arsenic	10/10	1.1 - 6	03SS0901	-	18	0.3	No
Barium	10/10	6.7 - 23.2	03SS0901	-	330	0.1	No
Cadmium	1/10	0.91	03SS0901	0.2 - 0.25	0.36	2.5	Yes
Calcium	6/10	497 - 4560	03SS0501	204 - 246	NA	NA	No
Chromium	10/10	2.8 - 10.6	03SS0901	-	26	0.4	No
Cobalt	3/10	1.1 - 2.1	03SS1001-D	0.99 - 1.2	13	0.2	No
Copper	5/10	1.3 - 15.2	03SS0901	0.99 - 1.2	28	0.5	No
Iron	10/10	2560 - 12900	03SS0401	-	200	64.5	Yes
Lead	10/10	2.6 - 59.3	03SS0901	-	11	5.4	Yes
Magnesium	2/10	277 - 1080	03SS0901	197 - 246	NA	NA	No
Manganese	10/10	1.9 - 44.2	03SS0901	0	220	0.2	No
Mercury	5/10	0.014 - 0.08	03SS0701	0.013 - 0.015	0.1	0.8	No
Nickel	7/10	1.4 - 8	03SS0901	1 - 1.2	38	0.2	No
Selenium	1/10	0.68	03SS0401	0.61 - 0.74	0.52	1.3	Yes
Vanadium	10/10	5.1 - 18.8	03SS0401	-	7.8	2.4	Yes
Zinc	10/10	1.7 - 255	03SS0901	-	46	5.5	Yes
Miscellaneous Parameters (mg/kg)							
Cyanide	1/10	0.14	03SS0601	0.13 - 0.17	0.9	0.2	No

Notes

(1) Sample-specific quantitation limits

(2) Hazard quotient (HQ) = maximum detected concentration ÷ ecological screening value.

(3) An analyte was an ecological chemical of potential concern (COPC) if the maximum detected concentration was greater than the ecological screening value (i.e., HQ>1), or if an ecological screening value was not available. Calcium and magnesium, however, are nutrients that were not considered to be COPCs.

(4) Ecological screening value for endrin.

NA = Ecological screening value not available.

µg/kg = micrograms per kilogram

mg/kg = milligrams per kilogram

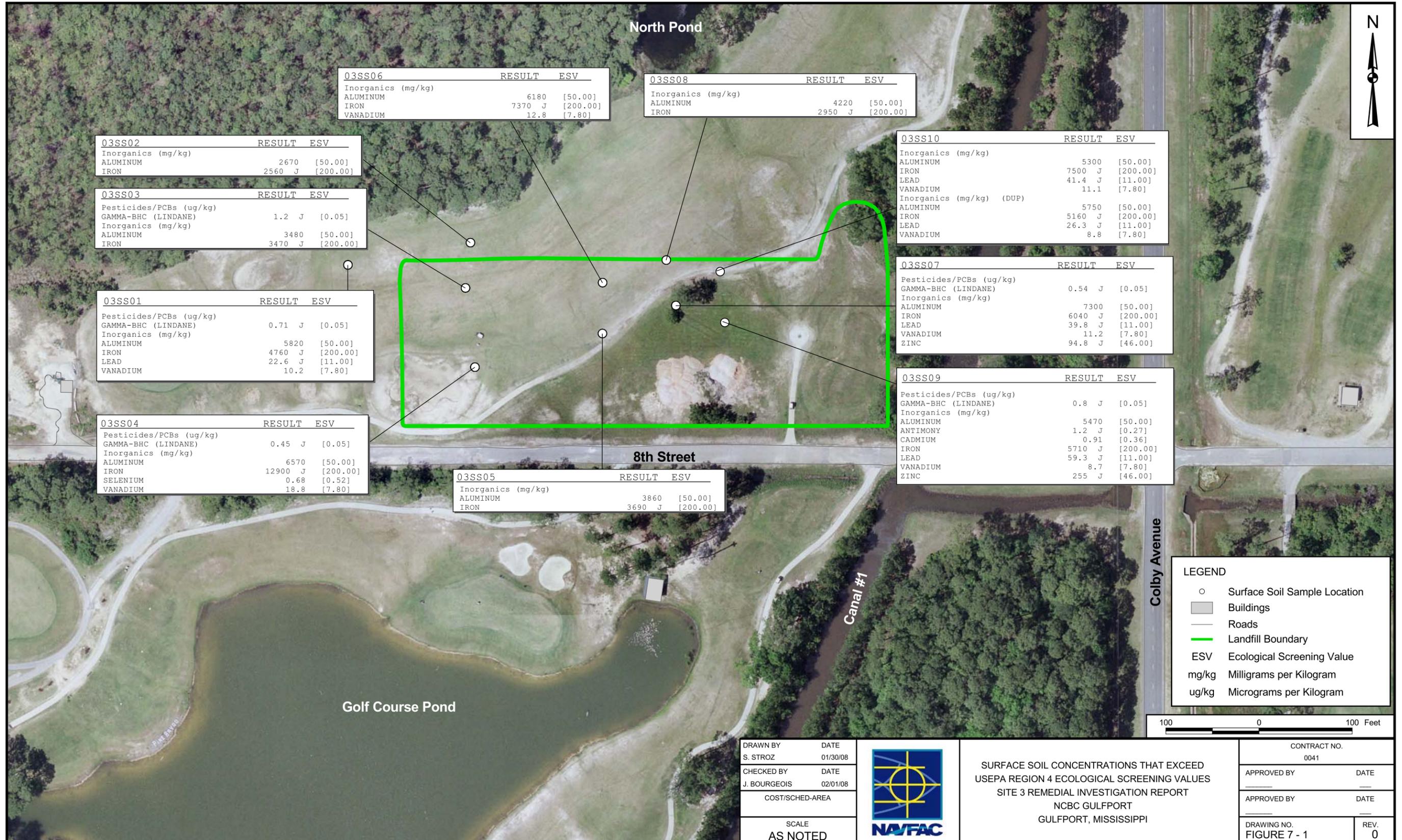


TABLE 7-2
SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SURFACE WATER
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
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Analyte	Frequency of Detection	Range of Detected Concentrations	Sample of Maximum Detected Concentration	Range of Non-detects ⁽¹⁾	Ecological Screening Value	Maximum Hazard Quotient ⁽²⁾	COPC (Yes/No) ⁽³⁾
Volatile Organic Compounds (µg/L)							
ACETONE	1/8	4	03SW1501	5	NA	NA	Yes
Semivolatile Organic Compounds (µg/L)							
BIS(2-ETHYLHEXYL)PHTHALATE	1/8	19	03SW1501	10	0.3	63.3	Yes
Inorganics (µg/L)							
ALUMINUM	1/8	427	03SW1501	21.2 - 398	87	4.9	Yes
BARIUM	8/8	1.9 - 53.3	03SW1501	-	NA	NA	Yes
CALCIUM	8/8	2680 - 22000	03SW0501	-	NA	NA	No
COPPER	2/8	13 - 15.5	03SW1501	3.19	6.54	2.4	Yes
IRON	7/8	135 - 3680	03SW0501	131	1000	3.7	Yes
LEAD	2/8	1.9	03SW0301/03SW1501	1.8	1.32	1.4	Yes
MAGNESIUM	8/8	1720 - 4150	03SW0401	-	NA	NA	No
MANGANESE	8/8	8 - 98.2	03SW0301	-	NA	NA	Yes
POTASSIUM	2/8	5520 - 6010	03SW0601-D	1570 - 3880	NA	NA	No
SELENIUM	1/8	4.7	03SW0601-D	4.04	5	0.9	No
SODIUM	8/8	13400 - 21600	03SW0601	-	NA	NA	No
ZINC	7/8	3.4 - 13.4	03SW0301	3.22	58.91	0.2	No

Notes

(1) Sample-specific quantitation limits

(2) Hazard quotient (HQ) = maximum detected concentration ÷ ecological screening value.

(3) An analyte was an ecological chemical of potential concern (COPC) if the maximum detected concentration was greater than the ecological screening value (i.e., HQ>1), or if an ecological screening value was not available. However, calcium, magnesium, potassium, and sodium are nutrients that were not considered to be COPCs.

NA = Ecological screening value not available.

µg/L = micrograms per liter

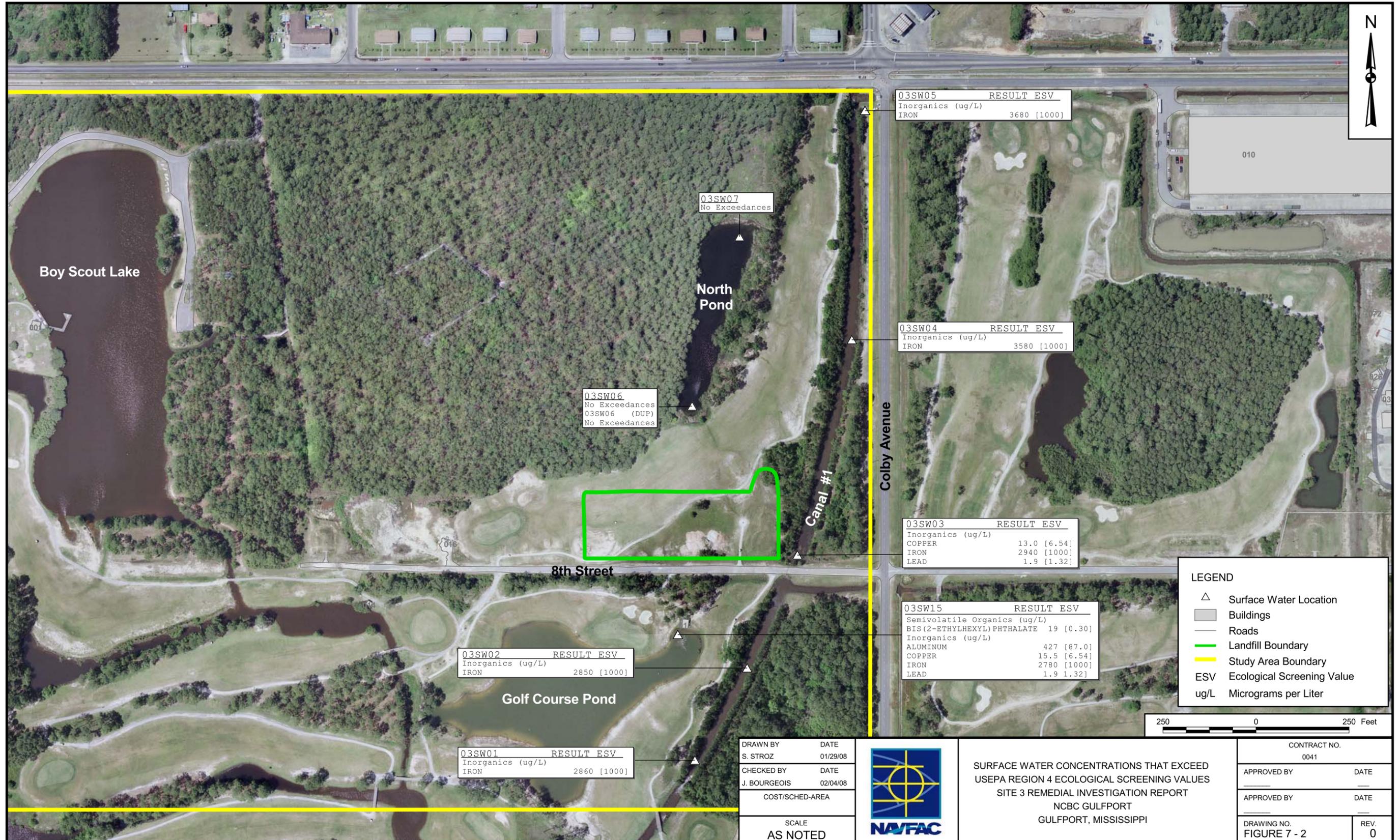


TABLE 7-3
SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEDIMENT
SITE 3 REMEDIAL INVESTIGATION REPORT
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Analyte	Frequency of Detection	Range of Detected Concentrations	Sample of Maximum Detected Concentration	Range of Non-detects ⁽¹⁾	Ecological Screening Value	Maximum Hazard Quotient ⁽²⁾	COPC (Yes/No) ⁽³⁾
Volatile Organic Compounds (µg/kg)							
Acetone	9/10	18 - 160	03SD0801	75	NA	NA	Yes
Carbon Disulfide	1/10	7	03SD0401	5 - 10	NA	NA	Yes
Pesticides/PCBs (µg/kg)							
4,4'-DDD	3/10	1.7 - 3.1	03SD0201	3.8 - 5.6	3.3	0.9	No
4,4'-DDE	4/10	1.4 - 3.7	03SD0101	3.8 - 4.7	3.3	1.1	Yes
4,4'-DDT	3/10	4.4 - 9.8	03SD0101	3.8 - 4.7	3.3	3.0	Yes
Total DDT ⁽⁴⁾	5/10	1.4 - 13.5	03SD0101	3.8 - 4.7	3.3	4.1	Yes
alpha-BHC	2/10	1.8 - 2.1	03SD0601-D	2 - 2.9	NA	NA	Yes
delta-BHC	1/10	2	03SD0901	2 - 2.9	NA	NA	Yes
gamma-BHC (Lindane)	1/10	2	03SD0201	2 - 2.9	3.3	0.6	No
alpha-Chlordane	2/10	2.2 - 3.3	03SD0601-D	2 - 2.6	1.7	1.9	Yes
gamma-Chlordane	2/10	1.5 - 2.1	03SD0601-D	2 - 2.6	1.7	1.2	Yes
Aroclor-1254	3/10	35 - 86	03SD0101	20 - 26	NA	NA	Yes
Aroclor-1260	4/10	32 - 130	03SD0101	20 - 24	NA	NA	Yes
Total Aroclor ⁽⁵⁾	4/10	56 - 216	03SD0101	20 - 24	33	6.5	Yes
Dieldrin	3/9	1.9 - 2.8	03SD0201	3.8 - 5	3.3	0.8	No
Endrin Ketone ⁽⁶⁾	1/10	3.2	03SD0101	3.8 - 5.6	3.3	0.97	No
Inorganics (mg/kg)							
Aluminum	10/10	713 - 15600	03SD0401	-	NA	NA	Yes
Arsenic	6/10	2.9 - 13.2	03SD0301	0.28 - 1.4	7.24	1.8	Yes
Barium	10/10	1.7 - 38.3	03SD0101	-	NA	NA	Yes
Calcium	8/10	74.4 - 892	03SD0401	18.8 - 23.9	NA	NA	No
Chromium	10/10	1.4 - 17.1	03SD0401	-	52.3	0.3	No
Cobalt	5/10	0.84 - 2	03SD0101	0.11 - 0.95	NA	NA	Yes
Copper	7/10	2.3 - 9.3	03SD0401	0.9 - 1.9	18.7	0.5	No
Iron	10/10	579 - 12000	03SD0401	-	NA	NA	Yes
Lead	9/10	2.6 - 22	03SD0401	0.71	30.2	0.7	No
Magnesium	10/10	33.2 - 568	03SD0401	-	NA	NA	No
Manganese	10/10	1.7 - 33.4	03SD0101	-	NA	NA	Yes
Mercury	6/10	0.01 - 0.07	03SD0401	0.01	0.13	0.5	No

TABLE 7-3
SELECTION OF ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN IN SEDIMENT
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Analyte	Frequency of Detection	Range of Detected Concentrations	Sample of Maximum Detected Concentration	Range of Non-detects ⁽¹⁾	Ecological Screening Value	Maximum Hazard Quotient ⁽²⁾	COPC (Yes/No) ⁽³⁾
Nickel	6/10	3 - 6.2	03SD0401	0.87 - 1.7	15.9	0.4	No
Sodium	2/10	37.4 - 39	03SD0101	4.8 - 23.2	NA	NA	No
Vanadium	10/10	1.3 - 25.4	03SD0401	-	NA	NA	Yes
Zinc	10/10	1.3 - 57.5	03SD0401	-	124	0.5	No

Notes

(1) Sample-specific quantitation limits

(2) Hazard quotient (HQ) = maximum detected concentration ÷ ecological screening value.

(3) An analyte was an ecological chemical of potential concern (COPC) if the maximum detected concentration was greater than the ecological screening value (i.e., HQ>1), or if an ecological screening value was not available. However, calcium, magnesium, and sodium are nutrients that were not considered to be COPCs.

(4) Total DDT = the sum of detected DDD, DDE, and DDT isomers.

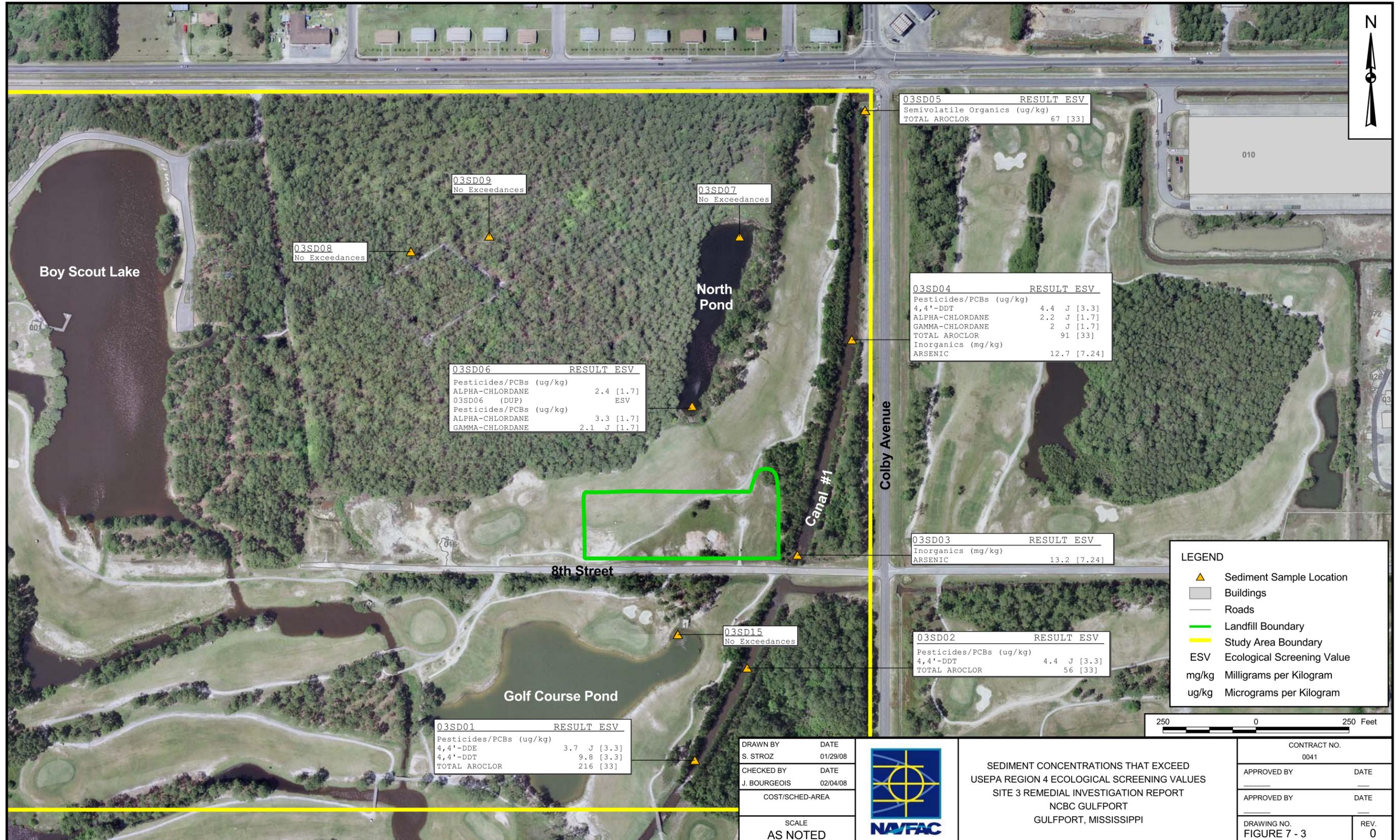
(5) Total Aroclor = the sum of detected Aroclors

(6) Ecological screening value for endrin.

NA = Ecological screening value not available.

µg/kg = micrograms per kilogram

mg/kg = milligrams per kilogram



Examples of factors typically considered during Step 3A include toxicological evaluation of COPCs, spatial distribution of contaminants, frequency of detection, background concentrations, and habitat quality (USEPA, 1997a; United States Navy, 1999). Furthermore, the preliminary assessment and measurement endpoints are refined, the site conceptual model is developed, and initial food-chain modeling is conducted (at sites where applicable) to evaluate risks to upper-level receptors (USEPA, 2000a). The objective of the Step 3 refinement is to better define those chemicals that contribute to potentially unacceptable levels of ecological risk and to identify and eliminate from further consideration those chemicals that were initially selected as COPCs because of the use of very conservative assumptions.

7.5.2 Assessment and Measurement Endpoints

Based on the habitats present and the migration pathways and routes of exposure of chemicals at Site 3, the site-specific assessment endpoints are the protection of the following groups of receptors from adverse effects of site-related contaminants on growth, survival, and reproduction:

- Soil invertebrates
- Terrestrial plants
- Benthic invertebrates
- Aquatic organisms
- Piscivorous birds
- Piscivorous mammals

The assessment endpoints listed above were selected for evaluation in Step 3A of the baseline ecological risk assessment for the reasons described below.

7.5.2.1 Soil Invertebrates

Earthworms, insect larvae, and other soil invertebrates at Site 3 aid in the formation of soil and the redistribution and decomposition of organic matter in soil. They can also accumulate bioaccumulative contaminants that can then be transferred to higher trophic-level organisms that consume soil invertebrates.

7.5.2.2 Terrestrial Vegetation

Terrestrial vegetation at Site 3 consists largely of mowed grass. Trees, shrubs, vines, and herbs occur near the boundaries of the former landfill; these plants serve as a food source and provide shade and

cover for various organisms, and they help to prevent soil erosion, among other important functions. They also can accumulate certain contaminants that can then be transferred to the higher trophic-level organisms that consume plants. The existing soil cover over the former landfill and burning pit probably minimizes the exposure pathway to terrestrial vegetation, but as a conservative measure, potential risks to terrestrial vegetation were evaluated.

7.5.2.3 Benthic Invertebrates

A variety of benthic invertebrates such as crayfish and immature forms of numerous insect species occur in the water bodies and wetlands at and near Site 3. Benthic invertebrates can be exposed to site-related contaminants through groundwater discharge. Benthic invertebrates can accumulate contaminants that can then be transferred to higher trophic-level organisms when consumed. These invertebrates serve as prey items for reptiles and amphibians, for mammal species such as the opossum, raccoon, and mink, and for numerous bird species.

7.5.2.4 Aquatic Organisms

Fish and other aquatic organisms such as daphnids, midges, and mosquito larvae are present in water bodies near Site 3. They are directly exposed to contaminants in surface water. Aquatic organisms serve as a food source for higher trophic-level organisms such as birds and mammals. Like benthic invertebrates, aquatic biota can accumulate contaminants that can then be transferred to higher trophic-level organisms when consumed.

7.5.2.5 Piscivorous Birds and Mammals

The term “piscivorous” is used here in a broad sense to describe birds and mammals that prey on not only fish but on a variety of aquatic and sediment dwelling organisms (e.g., crayfish, frogs). Piscivorous birds that forage in water bodies near Site 3 include wading birds such as herons and egrets. Piscivorous mammals presumed to be present include the river otter and mink. The raccoon is often thought of as piscivorous, and it does consume aquatic organisms, but the majority of its diet typically consists of non-aquatic animal and plant tissues (USEPA, 1993a). Piscivorous birds and mammals can be exposed to and accumulate site-related contaminants that have accumulated in prey items obtained from the site. This would be especially applicable for contaminants such as PCBs, organochlorine pesticides, and certain metals.

7.5.2.6 Other Potential Endpoints

As indicated in USEPA guidance (1997a), it is not practical to evaluate risks directly to all of the individual components of the ecosystem. Instead, assessment endpoints focus the risk assessment on particular components of the ecosystem that will tend to yield the highest risks; this should provide protection for endpoints that have lower risks.

As mentioned earlier, the former landfill and burning pit are covered by at least 2 feet of fill dirt within an intensively managed golf course fairway. With this in mind, the surface soil exposure pathway for terrestrial receptors such as birds, mammals, and reptiles is incomplete or negligible and insignificant. In addition, threshold oral toxicity values for reptiles and amphibians are not available for most chemicals. With the above factors in mind, amphibians, reptiles, herbivores, and omnivores were not selected as assessment endpoints. Instead, potential risk from bioaccumulation and biomagnification of contaminants will be assessed for piscivorous birds and mammals.

7.5.2.7 Measurement Endpoints

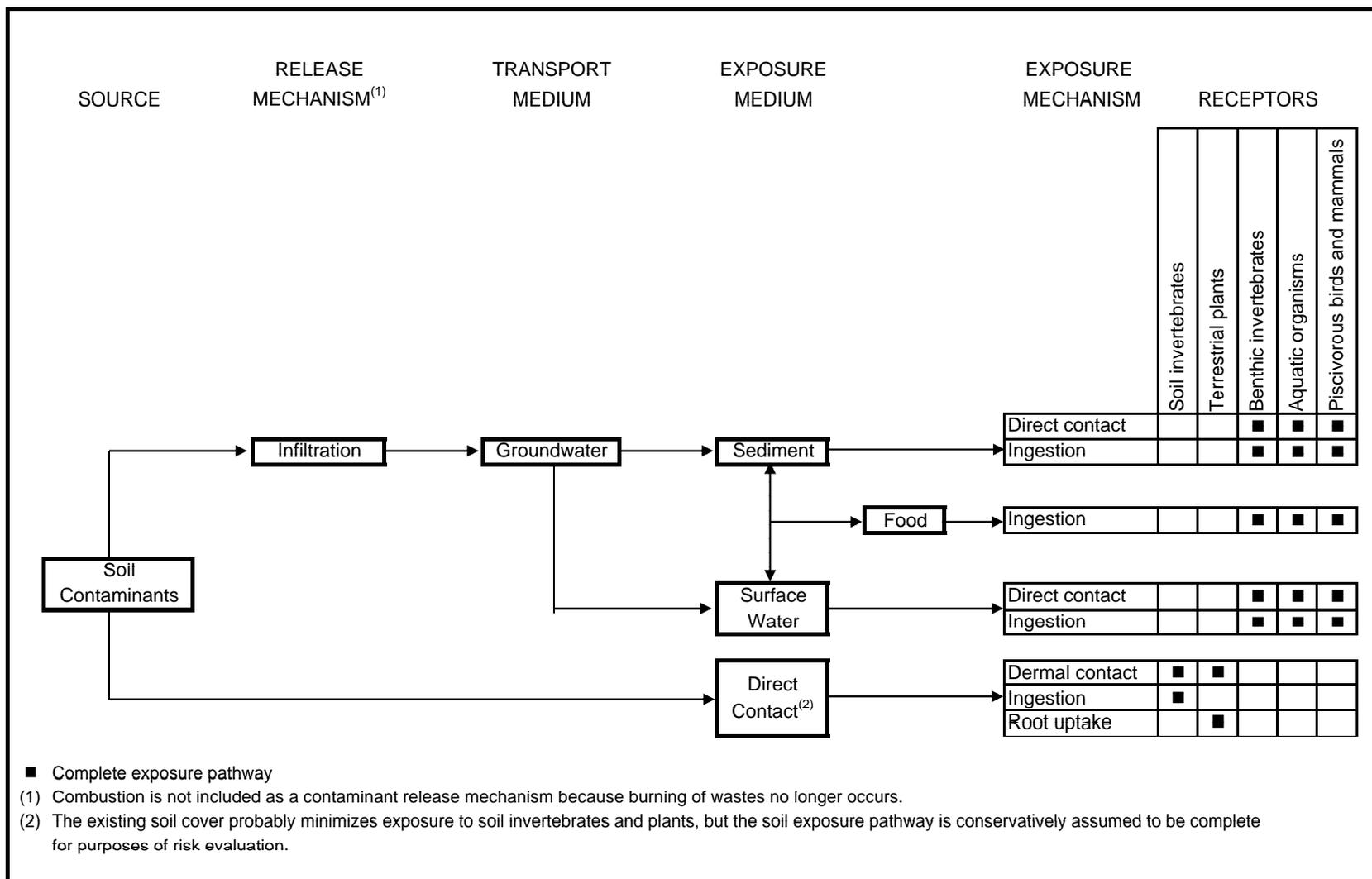
Measurement endpoints for soil invertebrates, benthic invertebrates, and aquatic organisms in Step 3A of the baseline ecological risk assessment are similar to those in the screening-level assessment, chemical concentrations in surface soil, sediment, and surface water that are associated with adverse effects on growth, survival, and reproduction of soil invertebrates and benthic and aquatic organisms. The measurement endpoints are represented by ESVs for surface soil, sediment, and surface water. Other guidelines were also used in some instances.

Adverse impacts on survival, growth, and reproduction of piscivorous birds and mammals were evaluated by comparing estimated ingested doses of contaminants in surface water, sediment, and food items to threshold oral toxicity values.

7.5.3 Conceptual Exposure Model

The site conceptual exposure model is designed to diagram the potentially exposed receptor populations and applicable exposure pathways based on the physical nature of the site and the potential contaminant source areas. The contaminant transport pathways for Site 3 are shown schematically on Figure 7-4. These pathways describe the movement from sources of contamination to potential ecological receptors; the linkage of these items is the CSM.

**FIGURE 7-4
CONCEPTUAL EXPOSURE MODEL
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**



Overland runoff and erosion are negligible at the relatively flat and vegetation-covered site, and are not included on Figure 7-4. The aquatic and benthic receptors referred to on Figure 7-4 are those in nearby water bodies such as Canal No. 1 and North Pond and wetlands north of the site. Combustion was undoubtedly a major contaminant release mechanism during the period of active landfill and burning pit operations. However, combustion is not a current contaminant release mechanism at Site 3 because burning activities have ceased and the landfill is covered with soil. The soil cover also precludes the volatilization pathway. The primary contaminant migration pathway at Site 3 is infiltration of soil contaminants into groundwater and subsequent potential seepage into surface water, primarily into Canal No. 1.

7.5.4 Step 3A Risk Characterization and Discussion

Several chemicals detected in surface soil, sediment, and surface water were initially retained as ecological COPCs because their chemical concentrations exceeded ESVs or because ESVs were not available. The remainder of this section discusses soil COPCs as related to terrestrial invertebrates and plants (Section 7.5.4.1), surface water and sediment COPCs as related to aquatic and benthic receptors (Section 7.5.4.2), and COPCs that pose risk to piscivorous wildlife via the food chain (Section 7.5.4.3).

7.5.4.1 Potential Risk to Terrestrial Invertebrates and Plants

7.5.4.1.1 Semivolatile Organic Compounds

ESVs were not available for two SVOCs detected in surface soil: bis(2-ethylhexyl) phthalate and caprolactam (see Table 7-1).

Bis(2-ethylhexyl) phthalate

Bis(2-ethylhexyl) phthalate was detected in six surface soil samples, and concentrations ranged from 52 to 280 µg/kg. Phthalates are common environmental contaminants due to their use in plastics. Phthalates can also be an artifact of sampling and/or analytical methods. Phthalates are relatively persistent in the environment, and biodegradation of phthalates in soil is a slow process (Gibbons and Alexander, 1989). Although there is no USEPA Region 4 ESV for bis(2-ethylhexyl) phthalate, Oak Ridge National Laboratory (ORNL) soil screening benchmarks for phthalates are as follows:

- Plant toxicity (di-n-butyl phthalate): 200 mg/kg (Efroymson et al., 1997a)
- Plant toxicity (diethyl phthalate): 100 mg/kg (Efroymson et al., 1997a)
- Earthworm toxicity (dimethyl phthalate): 200 mg/kg (Efroymson et al., 1997b)

The ORNL benchmarks are not for bis(2-ethylhexyl) phthalate, but the toxicity of phthalates is generally similar in magnitude, so the above values provide a guide for evaluating bis(2-ethylhexyl) phthalate. The maximum detected concentration of 280 µg/kg (0.28 mg/kg) and detection limits at Site 3 are significantly less than the ORNL benchmarks, indicating that potential risk to earthworms and plants is not likely at the site.

Caprolactam

Caprolactam is used in the manufacture of synthetic fibers and as a solvent for polymers, especially for nylon materials, plastics, paints, coatings, and floor polishes (Hazardous Substances data Bank [HSDB], 2005). Surface soil toxicity data were not located, and a literature review compiled by the United Nations Environment Programme (UNEP) (UNEP, 2001) stated that no caprolactam toxicity data are available for terrestrial organisms. In summary, the lack of toxicity data precludes an evaluation of potential impacts to surface soil organisms. However, caprolactam was detected in only two surface soil samples, and its non-detections in surface water and sediment suggest that it is not migrating into those media.

7.5.4.1.2 Pesticides

Concentrations of gamma-BHC (also known as Lindane) exceeded the ESV in five samples, and the detection limits in non-detect samples also exceeded the ESV (see Table 7-4). The Region 4 ESV is a “target” value established by the Dutch (Ministry of Housing, Spatial Planning, and Environment [MHSPE], 1994) to represent the concentration required for the full functionality of human, animal, and plant life. Dutch target values are based on standards for drinking water and surface waters (MHSPE, 1994). The applicability of the 0.05 µg/kg ESV is unclear, so the potential risk posed by Lindane at Site 3, where the maximum detected concentration was 1.2 µg/kg, is uncertain.

ESVs were not available for alpha- and gamma-chlordane, endosulfan II, endosulfan sulfate, or heptachlor epoxide. Most detected concentrations of these five compounds were approximately 1 µg/kg or less (see Table 7-4). A background data set has not been generated for NCBC Gulfport, so a comparison of concentrations at Site 3 to background values cannot be performed.

The pesticides detected at Site 3 are organochlorine insecticides that are no longer used but are known to be extremely persistent in soil. Concentrations in some samples might pose risks to soil invertebrates; after all, these insecticides were manufactured to control invertebrates. Potential risks (if any) might be due to historical use of these insecticides rather than landfill operations, but a background data set has not been generated for NCBC Gulfport. The USEPA Region 4 ESV for “total organochlorinated pesticides” is 100 µg/kg. Concentrations of total organochlorinated pesticides in all Site 3 surface soil samples are significantly less than this value.

TABLE 7-4
DATA SUMMARY FOR SURFACE SOIL ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Rev. 2
11/11/11

Analyte	Frequency of Detection	Range of Detected Concentrations	Sample of Maximum Detected Concentration	Range of Detection Limits ⁽¹⁾	Average Concentration ⁽²⁾	Ecological Screening Value (ESV)	Maximum Hazard Quotient	Number of Detects > ESV	Number of Nondetects > ESV
Semivolatile Organic Compounds (µg/kg)									
Bis(2-ethylhexyl)phthalate	6/10	52 - 280	03SS0901	370 - 450	144	NA	NA	NA	NA
Caprolactam	2/10	170 - 260	03SS0301	360 - 430	197	NA	NA	NA	NA
Pesticides (µg/kg)									
Alpha-Chlordane	7/10	0.14 - 26	03SS0901	0.29 - 0.36	5.2	NA	NA	NA	NA
Gamma-Chlordane	6/10	0.098 - 14	03SS0901	0.28 - 0.36	3.6	NA	NA	NA	NA
Endosulfan II	4/10	0.28 - 1.5	03SS0901	0.56 - 0.72	0.4	NA	NA	NA	NA
Endosulfan Sulfate	1/10	2.1	03SS0901	0.56 - 0.72	0.5	NA	NA	NA	NA
Gamma-BHC (Lindane)	5/10	0.45 - 1.2	03SS0301	0.29 - 0.32	0.4	0.05	24.0	5	5
Heptachlor Epoxide	3/10	0.23 - 0.47	03SS0101	0.28 - 0.36	0.20	NA	NA	NA	NA
Herbicides (µg/kg)									
Dinoseb	1/10	14	03SS1001	13 - 17	8.1	NA	NA	NA	NA
Inorganics (mg/kg)									
Aluminum	10/10	2670 - 7300	03SS0701	-	5110	50	146.0	10	-
Antimony	1/10	1.2	03SS0901	0.99 - 1.2	0.6	0.27	4.4	1	9
Cadmium	1/10	0.91	03SS0901	0.2 - 0.25	0.19	0.36	2.5	1	0
Iron	10/10	2560 - 12900	03SS0401	-	5578	200	64.5	10	-
Lead	10/10	2.6 - 59.3	03SS0901	-	18.4	11	5.4	4	-
Selenium	1/10	0.68	03SS0401	0.61 - 0.74	0.37	0.52	1.3	1	9
Vanadium	10/10	5.1 - 18.8	03SS0401	-	9.7	7.8	2.4	6	-
Zinc	10/10	1.7 - 255	03SS0901	-	45.1	46	5.5	2	-

Notes

(1) Sample-specific quantitation limits in non-detect samples.

(2) Average concentration of all samples calculated using ½ the detection limit for nondetected samples.

NA = Ecological screening value not available.

ESV = Ecological screening value

µg/kg = micrograms per kilogram

mg/kg = milligrams per kilogram

7.5.4.1.3 Herbicides

Dinoseb was detected in 1 of 10 surface soil samples. Dinoseb is a phenolic herbicide formerly used largely for the selective control of grass and broadleaf weeds. The use of dinoseb in the United States was banned by the USEPA in 1986, an action based primarily on the risk of birth defects by applicators and other persons with substantial dinoseb exposure (Extoxnet, 1993). An ESV or other surface soil guideline has not been established.

7.5.4.1.4 Metals

Maximum concentrations of eight metals exceeded their respective ESVs (see Table 7-4); these metals are discussed below.

Aluminum

Aluminum concentrations in all samples exceeded the 50 mg/kg ESV (see Table 7-4). Aluminum is considered a COPC only when the soil pH is less than 5.5 (USEPA 2003a), but soil pH data are not available from Site 3 or other nearby locations. Aluminum is the most commonly occurring metallic element in the earth's crust (USEPA, 2003a), and aluminum concentrations in Site 3 soil samples are similar to those at other NCBC Gulfport sites. Although there is some degree of uncertainty at Site 3, aluminum probably does not pose site-related risk to plants or soil invertebrates.

Antimony

Antimony was detected in 1 of 10 samples; its detected concentration (1.2 mg/kg) exceeded the 0.27 mg/kg screening value, which is an Eco-SSL for risk to mammals (USEPA, 2005a) rather than risks to plants or soil invertebrates. The antimony Eco-SSL for soil invertebrates is 78 mg/kg (USEPA, 2005a). An Eco-SSL for plants is not available, but the ORNL plant toxicity threshold is 5 mg/kg (Efroymsen et al., 1997a). The maximum antimony concentration (1.2 mg/kg) and detection limits in non-detect samples are less than the ORNL and Eco-SSL values. Therefore, antimony is not expected to pose risk to plants or soil invertebrates.

Cadmium

Cadmium was detected in 1 of 10 samples; its detected concentration (0.91 mg/kg) exceeded the 0.36 mg/kg screening value, which is an Eco-SSL for risk to mammals (USEPA, 2005b) rather than risks to plants or soil invertebrates. The cadmium Eco-SSLs for plants and soil invertebrates are 32 mg/kg and 140 mg/kg, respectively (USEPA, 2005b). The maximum cadmium concentration of 0.91 mg/kg and detection limits in non-detect samples are less than the Eco-SSLs for plants and soil invertebrates, so risks to these receptors are not expected.

Iron

Iron concentrations exceeded the 200 mg/kg ESV in all 10 surface soil samples (see Table 7-4). The ESV is an ORNL value for toxicity to soil microorganisms, but the authors of the ORNL publication state that their confidence in the 200 mg/kg benchmark is low because of the limited data available (Efroymsen et al., 1997b). There are no ORNL soil screening values for iron toxicity to plants or earthworms (Efroymsen et al., 1997a; 1997b). Iron is an essential element that is required by all forms of life, but toxicity thresholds for earthworms and plants could not be located, and USEPA (2003b) concludes that identifying a specific benchmark for iron in soil is difficult because iron toxicity depends on site-specific soil conditions such as pH, redox potential, and soil-water conditions. Iron is not expected to be toxic to plants in well-aerated soils with pH values between 5 and 8 (USEPA, 2003b), but soil pH data are not available from Site 3 or other nearby locations. The iron concentrations in Site 3 soil samples are similar to those at other NCBC Gulfport sites. In summary, potential risks to plants or soil invertebrates are uncertain but are probably not related to activities at the former landfill and burning pit.

Lead

Lead was detected in all samples, and concentrations exceeded the 11 mg/kg ESV in four samples, with a maximum HQ of 5.4 (see Table 7-4). The ESV is an Eco-SSL based on risks to birds instead of risks to plants and soil invertebrates. The lead Eco-SSLs for plants and soil invertebrates are 120 mg/kg and 1,700 mg/kg, respectively (USEPA, 2005c). The maximum concentration of 59.3 mg/kg is less than these guidelines. Therefore, lead poses no risk to plants and soil invertebrates.

Selenium

Selenium was detected in 1 of 10 samples; its detected concentration (0.68 mg/kg) and detection limits in non-detect samples (0.61 to 0.74 mg/kg) slightly exceeded the 0.52 mg/kg screening value (see Table 7-4). The ESV is an Eco-SSL based on selenium risks to plants; the Eco-SSL for soil invertebrates is 4.1 mg/kg (USEPA, 2007c). Other screening values for selenium in soil include an ORNL earthworm value of 70 mg/kg (Efroymsen et al., 1997b), an ORNL plant value of 1.0 mg/kg (Efroymsen et al., 1997a), and a Canadian soil quality guideline of 1.0 mg/kg (Canadian Council of Ministers of the Environment [CCME], 2004). In summary, selenium concentrations indicate no risk to soil invertebrates. The single detected selenium concentration (0.68 mg/kg) only slightly exceeded the Eco-SSL for plant toxicity (0.52 mg/kg) and was less than other guidelines, so potential risks are minor at worst.

Vanadium

Vanadium was detected in all samples, and concentrations exceeded the 7.8 mg/kg ESV in six samples, with a maximum HQ of 2.4 (see Table 7-4). The ESV is an Eco-SSL based on risks to birds rather than risks to plants and soil invertebrates. Eco-SSLs for plants and soil invertebrates are not available

(USEPA, 2005d), but the Canadian soil quality guideline for vanadium is 130 mg/kg and is based on toxicity tests using plants and soil invertebrates (Environment Canada, 1999; CCME, 2004). The maximum vanadium detection of 18.8 mg/kg is significantly less than the Canadian guideline. Therefore, impacts to plants and invertebrates from vanadium in soil are not expected.

Zinc

Zinc was detected in all samples, with a maximum HQ of 5.5 (see Table 7-4). Zinc concentrations exceeded the 46 mg/kg ESV in two samples, SS-07 at 94.8 mg/kg and SS-09 at 255 mg/kg (see Figure 7-1). The ESV is an Eco-SSL based on risks to birds instead of risks to plants and soil invertebrates. The zinc Eco-SSLs for plants and soil invertebrates are 160 mg/kg and 120 mg/kg, respectively (USEPA, 2007d). Only one sample (SS-09 at 255 mg/kg) had a zinc concentration that exceeded the Eco-SSL for plants and invertebrates. The 255 mg/kg concentration in sample SS-09 also exceeded the 100 mg/kg ORNL benchmark for earthworms (Efroymson et al., 1997b) and the Canadian soil quality guideline of 200 mg/kg (CCME, 2004). Based on available toxicity guidelines, the 255 mg/kg zinc concentration in sample SS-09 poses potential risk to plants and invertebrates, but zinc concentrations in samples SS-01 through SS-08 and SS-10 do not pose potential risk to these receptors. Surface soil samples were not collected to the east, south, and southwest of SS-09 (see Figure 7-1), so the extent of zinc contamination in those directions is uncertain.

7.5.4.1.5 Summary and Conclusions: Surface Soil

Chemicals initially selected as COPCs in the screening process were further evaluated to determine the likelihood that concentrations in surface soil pose risk to soil invertebrates and plants.

Bis(2-ethylhexyl) phthalate and caprolactam were the only SVOCs that were COPCs in surface soil. Toxicity data for phthalates suggest that bis(2-ethylhexyl) phthalate poses minimal risk at Site 3. The absence of toxicity data precludes an evaluation of potential impacts to surface soil organisms from caprolactam, which was detected in two surface soil samples.

Several organochlorine insecticides were detected in Site 3 surface soil samples; these pesticides are no longer used but are extremely persistent in soil, and it is unclear whether their concentrations at Site 3 are due to historical use or to landfill wastes. Concentrations in some samples might pose risks to soil invertebrates, but concentrations of total organochlorinated pesticides in all surface soil samples were less than the ESV for total organochlorinated pesticides, suggesting negligible risks to soil invertebrates.

Dinoseb was detected in 1 of 10 surface soil samples and was the only herbicide detected at the site. Surface soil toxicity thresholds have not been established for dinoseb, so there is uncertainty regarding its potential impacts to plants.

Zinc poses potential risk to plants and invertebrates near sample SS-09. Concentrations of other metals tended to be low and pose negligible potential risks to soil invertebrates and plants.

7.5.4.2 Potential Risk to Aquatic and Benthic Organisms

Benthic invertebrates and aquatic organisms represent different assessment endpoints, and the measurement endpoints used to evaluate risks to these assessment endpoints are different. Specifically, chemical concentrations in sediment are used to evaluate potential risks to benthic invertebrates, and chemical concentrations in surface water are used to evaluate potential risks to aquatic organisms. Nevertheless, they are evaluated together in this section because of the close association between surface water and sediment.

Chemicals that were COPCs in surface water or sediment are discussed below.

7.5.4.2.1 Volatile Organic Compounds

Acetone

Toxicity data were not available regarding acetone's effects to aquatic and benthic organisms, so its potential toxicity in sediment and surface water cannot be evaluated. Acetone was detected in 9 of 10 sediment samples (18 to 160 µg/kg) and in one of eight surface water samples (4 µg/L). Acetone is produced and used as a solvent and chemical intermediate in the manufacture of numerous chemical products such as oils, waxes, resins, plastics, pharmaceuticals, rubber cement, and paint and varnish removers. Acetone is typically released into the environment as stack emissions or in wastewater. Acetone also occurs naturally as a metabolic by-product of plants and animals and is released into the atmosphere by volcanoes and forest fires. If released into water, acetone is volatile and tends to biodegrade fairly rapidly (Spectrum Laboratories, 2003), so its frequent presence in sediment samples near Site 3 is puzzling, unless due to laboratory contamination. Acetone is commonly present in environmental samples due to laboratory contamination.

As mentioned in Section 4, six surface water and co-located sediment samples were collected west of Site 3 as part of the NCBC Gulfport Housing EA for the northwestern corner of the base. Locations of these samples are shown on Figure 2-3 as SW/SD10, SW/SD11, SW/SD12, SW/SD13, SW/SD14, and SW/SD16. Although the surface water and sediment data from these six locations do not represent basewide background conditions, the data are nevertheless useful as approximations of surface water and sediment concentrations in nearby areas that have not been impacted by Site 3 contaminants. Acetone was detected in five of these six sediment samples (21 to 290 µg/kg) and in three of six surface water samples (5 to 8 µg/L). The acetone data in these six samples and in the Site 3 samples suggest

either laboratory contamination or surface water and sediment contamination over an area much larger than Site 3. Regardless of whether the acetone data represent actual contamination or an artifact of laboratory analyses, the acetone detections do not appear to be related to Site 3.

Carbon Disulfide

Carbon disulfide is used as an industrial and chemical solvent and is also a natural product of anaerobic biodegradation. It was detected in only 1 of 10 sediment samples at a relatively low concentration of 7 µg/L. It was not detected in surface water. Sediment screening values and toxicity thresholds regarding carbon disulfide's effects to benthic organisms were not located.

7.5.4.2.2 Semivolatile Organic Compounds

No SVOCs were detected in sediment. Bis(2-ethylhexyl) phthalate was the only SVOC that was a COPC in surface water. It was detected in one of eight surface water samples, with a rather high HQ of 63.3 (see Table 7-2). The 0.3 µg/L USEPA Region 4 ESV is the chronic Ambient Water Quality Criterion (AWQC) established by USEPA in 1995. However, the most recent AWQC (USEPA, 2004a) does not contain freshwater or saltwater bis(2-ethylhexyl)phthalate criteria for aquatic organisms. Instead, the USEPA (USEPA, 2004a) document states that aquatic life toxicity data show that bis(2-ethylhexyl) phthalate "is not toxic to aquatic organisms at or below its solubility limit". The solubility limit for this compound is not provided in the USEPA (USEPA, 2004a) document, but HSDB (HSDB, 2005) states that the solubility limit for bis(2-ethylhexyl) phthalate is 285 µg/L at 24 degrees Celsius (75° F). In view of the above information, a surface water concentration of 19 µg/L bis(2-ethylhexyl) phthalate does not pose potential risk to aquatic receptors at the site.

7.5.4.2.3 Pesticides and PCBs

The pesticides 4,4'-DDE, 4,4'-DDT, total DDT (the sum of detected concentrations of individual DDT isomers), alpha-chlordane, gamma-chlordane, and total Aroclors (the sum of detected concentrations of individual Aroclors) were COPCs in sediment because their maximum detected concentrations exceeded ESVs. Alpha-BHC, delta-BHC, Aroclor-1254, and Aroclor-1260 were COPCs in sediment because ESVs were not available (see Table 7-3). No pesticides or PCBs were detected in surface water or groundwater (see Table 4-5).

Numerous guidelines are available for sediment contaminants, encompassing a wide range of values. MacDonald (MacDonald et al., 2003) reviewed and evaluated eight separate approaches to support the establishment of guidelines protective of sediment-dwelling organisms in Florida inland waters. Based on the results of that evaluation, threshold effect concentrations (TECs) and probable effect concentrations (PECs) were developed and are used by the Florida Department of Environmental Protection to evaluate

risk to sediment-dwelling organisms in inland (freshwater) systems. Although developed for Florida freshwater sediments, the MacDonald (MacDonald et al., 2003) values are often used to evaluate freshwater sediments in other states, especially when those states have not developed their own TECs and PECs. The TECs identify sediment concentrations below which adverse effects on sediment-dwelling organisms are unlikely to occur, and PECs indicate sediment concentrations above which adverse effects on sediment-dwelling organisms are likely to occur (MacDonald et al., 2003). Sediment samples with concentrations between the TEC and PEC are neither predicted to be toxic nor nontoxic. However, sediments that have concentrations of one or more COPCs between the TECs and PECs should be considered to be of moderate priority, and sediments with COPC concentrations in excess of one or more PECs should be considered to be of relatively high concern (MacDonald et al., 2003). Furthermore, the magnitude and frequency of exceedances of the PECs provide a basis for assigning relative priority to areas of concern with respect to contaminated sediments (MacDonald et al., 2003). Table 7-5 summarizes data for sediment COPCs at Site 3. Sediment COPCs for which TECs and PECs have been generated by MacDonald et al. (2003) are included in Table 7-6.

Sediment concentrations of total DDT and 4,4'-DDT exceeded their ESVs in three samples collected from Canal No. 1 (SD-01, SD-02, and SD-04; Figure 7-3). Concentrations of 4,4'-DDE, 4,4'-DDT, and total DDT were highest in sample SD-01, and 4,4'-DDE exceeded its ESV only in that sample, which is the upstream-most sample in the canal. Maximum screening HQs were 1.1 for 4,4'-DDE, 3.0 for 4,4'-DDT, and 4.1 for total DDT (see Table 7-5). The TECs for these three analytes are similar to the ESVs (see Table 7-6), and concentrations exceeded the TECs in the same samples. Concentrations of 4,4'-DDE, 4,4'-DDT, and total DDT were significantly less than their respective PECs (see Table 7-6). There is uncertainty associated with samples where concentrations are between the TEC and the PEC; this occurred for all three of these COPCs.

The alpha and gamma isomers of chlordane were detected only in sediment samples SD-04 and SD-06, with relatively low maximum HQs of 1.9 and 1.2, respectively. Gamma-chlordane concentrations were less than the TEC. The alpha-chlordane TEC (3.2 µg/kg) was exceeded only in the duplicate of SD-06, at 3.3 µg/kg.

Sediment toxicity guidelines were not available for the alpha and delta isomers of BHC. Alpha-BHC was detected in two sediment samples (1.8 and 2.1 µg/kg), and delta-BHC was detected in one sediment sample (2 µg/kg). The detected concentrations were less than detection limits in most other samples, and were "J-flagged", signifying that the analyte was identified but its concentration could not be precisely quantified because it was less than the contract-required quantitation limit but greater than the instrument detection limit. In addition, their maximum detected concentrations were less than the ESV for

**TABLE 7-5
DATA SUMMARY FOR SEDIMENT ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Analyte	Frequency of Detection	Range of Detected Concentrations	Sample of Maximum Detected Concentration	Range of Detection Limits ⁽¹⁾	Average Concentration ⁽²⁾	Ecological Screening Value (ESV)	Maximum Hazard Quotient	Number of Detects > ESV	Number of Nondetects > ESV
Volatile Organic Compounds (µg/kg)									
Acetone	9/10	18 - 160	03SD0801	75	58.6	NA	NA	NA	NA
Carbon Disulfide	1/10	7	03SD0401	5 - 10	3.7	NA	NA	NA	NA
Pesticides/PCBs (µg/kg)									
4,4'-DDE	4/10	1.4 - 3.7	03SD0101	3.8 - 4.7	2.2	3.3	1.1	1	6
4,4'-DDT	3/10	4.4 - 9.8	03SD0101	3.8 - 4.7	3.3	3.3	3.0	3	7
Total DDT ⁽³⁾	5/10	1.4 - 13.5	03SD0101	3.8 - 4.7	4.5	3.3	4.1	3	5
alpha-BHC	2/10	1.8 - 2.1	03SD0601-D	2 - 2.9	1.3	NA	NA	NA	NA
delta-BHC	1/10	2	03SD0901	2 - 2.9	1.3	NA	NA	NA	NA
alpha-Chlordane	2/10	2.2 - 3.3	03SD0601-D	2 - 2.6	1.4	1.7	1.9	2	8
gamma-Chlordane	2/10	1.5 - 2.1	03SD0601-D	2 - 2.6	1.3	1.7	1.2	2	8
Aroclor-1254	3/10	35 - 86	03SD0101	20 - 26	24.7	NA	NA	NA	NA
Aroclor-1260	4/10	32 - 130	03SD0101	20 - 24	32.4	NA	NA	NA	NA
Total Aroclor ⁽⁴⁾	4/10	56 - 216	03SD0101	20 - 24	49.4	33	6.5	4	-
Inorganics (mg/kg)									
Aluminum	10/10	713 - 15600	03SD0401	0	7534	NA	NA	NA	NA
Arsenic	6/10	2.9 - 13.2	03SD0301	0.28 - 1.4	4.9	7.24	1.8	2	0
Barium	10/10	1.7 - 38.3	03SD0101	0	15.9	NA	NA	NA	NA
Cobalt	5/10	0.84 - 2	03SD0101	0.11 - 0.95	0.8	NA	NA	NA	NA
Iron	10/10	579 - 12000	03SD0401	0	5073	NA	NA	NA	NA
Manganese	10/10	1.7 - 33.4	03SD0101	0	10.9	NA	NA	NA	NA
Vanadium	10/10	1.3 - 25.4	03SD0401	0	12.2	NA	NA	NA	NA

Notes

- (1) Sample-specific quantitation limits in non-detect samples.
 - (2) Average concentration of all samples calculated using ½ the detection limit for nondetected samples.
 - (3) Total DDT = the sum of detected DDD, DDE, and DDT isomers.
 - (4) Total Aroclor = the sum of detected Aroclors
- NA = Ecological screening value not available.
 ESV = Ecological screening value
 µg/kg = micrograms per kilogram
 mg/kg = milligrams per kilogram

**TABLE 7-6
COMPARISON OF SEDIMENT COPC CONCENTRATIONS TO SEDIMENT QUALITY GUIDELINES
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Analyte	Frequency of Detection	Range of Detected Concentrations	Average Concentration ⁽¹⁾	ESV ⁽²⁾	Sediment Quality Assessment Guideline ⁽³⁾		Number of Detects > ESV	Number of Detects > TEC
					TEC	PEC		
Pesticides/PCBs (µg/kg)								
4,4'-DDE	4/10	1.4 - 3.7	2.2	3.3	3.2	31	1	1
4,4'-DDT	3/10	4.4 - 9.8	3.3	3.3	4.2	63	3	3
Total DDT ⁽⁵⁾	5/10	1.4 - 13.5	4.5	3.3	5.3	570	3	3
alpha-Chlordane	2/10	2.2 - 3.3	1.4	1.7	3.2	18	2	1
gamma-Chlordane	2/10	1.5 - 2.1	1.3	1.7	3.2	18	2	0
Total Aroclor ⁽⁵⁾	4/10	56 - 216	49.4	33	60	680	4	3
Inorganics (mg/kg)								
Arsenic	6/10	2.9 - 13.2	4.9	7.24	9.8	33	2	2
Barium	10/10	1.7 - 38.3	15.9	NA	20	60	NA	5
Cobalt	5/10	0.84 - 2	0.8	NA	50	NG	NA	0

Notes

- (1) Average concentration of all samples calculated using ½ the detection limit for nondetected samples.
 - (2) USEPA Region 4 ecological screening value (ESV) (USEPA, 2001).
 - (3) Sediment quality assessment guidelines for the protection of sediment-dwelling organisms in Florida inland waters;
TEC = Threshold Effect Concentration, PEC = Probable Effect Concentration (MacDonald et al., 2003).
 - (4) Total DDT = the sum of detected DDD, DDE, and DDT isomers.
 - (5) Total Aroclor = the sum of detected Aroclors.
- NA = Ecological screening value not available.
NG = PEC guideline not available.
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

gamma-BHC (3.3 µg/kg). Alpha-BHC was detected in two of six sediment samples (1.5 and 1.9 µg/kg) collected west of Site 3 as part of the NCBC Gulfport Housing EA, and delta-BHC was detected in one of these six samples (2.4 µg/kg). The fairly low concentrations of alpha- and delta-BHC at Site 3 and their similarity to concentrations west of Site 3 suggests that their presence is probably due to historical pesticide usage for insect control rather than to landfill-related activities.

Aroclor-1254 and Aroclor-1260 were the only PCBs detected in Site 3 sediments. These two PCBs were detected in four of five canal samples and were not detected in five sediment samples collected from the North Pond and forested wetland north of the site and the Golf Course Pond south of the site. Sediment toxicity guidelines were not available for individual Aroclors, but concentrations of total Aroclors exceeded the 33 µg/kg ESV in four samples (see Figure 7-3). Total Aroclor concentrations exceeded the 60 µg/kg TEC in sediment samples SD-01, SD-04, and SD-05. Concentrations of total Aroclors in all sediment samples were significantly less than the PEC (see Table 7-6). Like DDT and its metabolites, Aroclor concentrations were greatest in sample SD-01, which is the upstream-most sample in Canal No. 1. Because this sample location is upgradient of Site 3 (relative to surface water runoff and groundwater flow), the presence of these compounds in SD-01 is probably not due to the former landfill and burning pit. Furthermore, Aroclors were not detected in Site 3 surface and subsurface soil, in any of 24 groundwater samples analyzed for PCBs, or in the six sediment and surface water samples collected west of Site 3 as part of the NCBC Gulfport Housing EA. This suggests that PCB concentrations in the canal samples are due to sources upstream of Site 3; as mentioned earlier, Canal No. 1 is the primary drainage ditch for the western portion of the base. Regardless of the source or sources, Aroclor concentrations were not especially high relative to the TEC, but potential risks to benthic invertebrates near samples SD-01, SD-04, and SD-05 cannot be ruled out. PCB data from samples collected in the forested wetland north of Site 3, North Pond and Golf Course Pond indicate no risk to aquatic and benthic receptors at those locations.

7.5.4.2.4 Inorganics

Arsenic was a COPC in sediment because concentrations exceeded its ESV, and sediment ESVs were not available for aluminum, barium, cobalt, iron, manganese, and vanadium (see Table 7-3). In surface water, aluminum, copper, iron, and lead were COPCs because their maximum concentrations exceeded ESVs, while ESVs were not available for barium and manganese (see Table 7-2). These COPCs are discussed below.

Aluminum

In surface water, aluminum was detected only in sample 03SW15, collected from Golf Course Pond south of Site 3, at a concentration of 427 µg/L and a screening HQ of 4.9 (see Table 7-2). The 87 µg/L ESV is the AWQC for aluminum (USEPA, 2004a). The aluminum criterion is based on water hardness of less

than 10 milligrams per liter (mg/L), and USEPA (USEPA, 2004a) states that aluminum is substantially less toxic at higher hardness, although the effects are not well quantified. Hardness was not measured in surface water samples collected for this project, but using calcium and magnesium concentrations in sample 03SW15, water hardness in that sample was 43.8 mg/L when calculated using the following equation from the American Public Health Association (APHA):

$$\text{Hardness, mg equivalent CaCO}_3\text{/L} = 2.497 [\text{Calcium, mg/L}] + 4.118 [\text{Manganese, mg/L}]$$

The 43.8 mg/L hardness value is substantially greater than the 10 mg/L value used to derive the ESV, so the actual toxicity threshold value of aluminum in sample 03SW15 is probably greater than 87 µg/L ESV, but the precise toxicity threshold value is uncertain.

Aluminum was detected in all 10 sediment samples, and concentrations ranged from 713 to 15,600 mg/kg with an average of 7,534 mg/kg (see Table 7-5). Aluminum in Site 3 sediments tended to be greater than in the six sediment samples collected west of Site 3 as part of the NCBC Gulfport Housing EA, in which concentrations ranged from 1,640 to 9,090 mg/kg with an average of 4,515 mg/kg (see Appendix C). There is no USEPA Region 4 ESV for aluminum in sediment, and no TEC and PEC. The freshwater sediment threshold effect level (TEL) for aluminum reported by National Oceanographic and Atmospheric Administration (NOAA) is 25,500 mg/kg (Buchman, 1999). All sediment concentrations at Site 3 were less than this value, suggesting no potential risk to benthic receptors.

Aluminum concentrations were elevated in groundwater, with an average groundwater concentration of about 5,600 µg/L and a maximum groundwater concentration of 58,900 µg/L (see Table 4-5). Therefore, although there is uncertainty regarding whether aluminum concentrations in Site 3 sediments and in one surface water sample were due to an upstream source or to groundwater seepage from Site 3, the elevated groundwater concentrations suggest groundwater as a source. Nevertheless, potential toxicity in surface water and sediment appears to be negligible or minor at worst.

Arsenic

Arsenic concentrations in sediment exceeded the sediment ESV in two samples collected from Canal No. 1, with a maximum HQ of 1.8 (see Figure 7-3). Arsenic concentrations in these two samples (12.7 and 13.2 mg/kg) were slightly greater than the TEC of 9.8 mg/kg and were significantly less than the 33 mg/kg PEC (see Table 7-6). Arsenic was not detected in surface water.

Arsenic was detected in two of six sediment samples collected west of Site 3 as part of the NCBC Gulfport Housing EA; detected concentrations in these samples were 3.7 and 4.6 mg/kg (see Appendix C). Sediment concentrations at Site 3 exceeded 4.6 mg/kg in all five samples collected from Canal No. 1.

Arsenic concentrations in 14 Mississippi Coastal Flatwoods soil samples ranged from 0.37 to 14.78 mg/kg, with an average of 4.42 mg/kg (Pettry and Switzer, 2001). Arsenic concentrations in all Site 3 sediment samples were within this range, with an average of 4.9 mg/kg. Therefore, the arsenic sediment concentrations in Site 3 canal samples might be due to naturally occurring conditions, but this is uncertain.

In summary, arsenic was not detected in surface water. Sediment concentrations of arsenic exceeded the ESV in only two samples, but the exceedances were relatively slight, and all concentrations were within the range reported by Pettry and Switzer (Pettry and Switzer, 2001). As a result, site-related risks from arsenic are probably minor.

Barium

Barium was detected in all sediment and surface water samples, but ESVs were not available for sediment or surface water. Sediment concentrations exceeded the 20 mg/kg TEC in five samples, at a maximum concentration of 38.3 mg/kg, which was less than the 60 mg/kg PEC (see Table 7-6). As mentioned earlier, there is uncertainty associated with samples where sediment concentrations are between the TEC and the PEC. Sediment and surface water concentrations of barium at Site 3 were similar to those in the six samples collected west of Site 3 as part of the NCBC Gulfport Housing EA, in which barium in sediment ranged from 3.4 to 30.2 mg/kg and barium in surface water ranged from 20.5 to 51.9 µg/L (see Appendix C). Thus, although there is uncertainty regarding the potential risks posed by barium in surface water and sediment, any potential risks at Site 3 are similar to those in the surrounding area and do not appear to be related to Site 3.

Cobalt

Cobalt was detected in five sediment samples. There is no USEPA Region 4 ESV, but the maximum sediment concentration of 2 mg/kg was significantly less than the 50 mg/kg TEC (see Table 7-6). Cobalt was not detected in surface water. The sediment and surface water data indicate negligible risk to aquatic and benthic receptors from cobalt.

Copper

Copper was detected in two of eight surface water samples collected at Site 3, with detected concentrations 13.0 and 15.5 µg/L compared to an ESV of 6.54 µg/L (see Table 7-7). Copper was detected in all six surface water samples collected west of Site 3 as part of the NCBC Gulfport Housing EA, and surface water concentrations in those samples ranged from 12.6 to 20.7 µg/L, with an average of 16.5 µg/L. The two detected concentrations at Site 3 were within this range. Copper was not a COPC in sediment (see Table 7-3). Therefore, copper poses no risk to benthic receptors, and any potential risk to aquatic receptors does not appear to be related to Site 3.

TABLE 7-7
DATA SUMMARY FOR SURFACE WATER ECOLOGICAL CHEMICALS OF POTENTIAL CONCERN
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI
PAGE 1 of 1

Analyte	Frequency of Detection	Range of Detected Concentrations	Sample of Maximum Detected Concentration	Range of Detection Limits ⁽¹⁾	Average Concentrations ⁽²⁾	Ecological Screening Value (ESV)	Maximum Hazard Quotient	Number of Detects > ESV	Number of Nondetects > ESV
Volatile Organics (ug/L)									
ACETONE	1/8	4	03SW1501	5	2.7	NA	NA	NA	NA
Semivolatile Organics (ug/L)									
BIS(2-ETHYLHEXYL)PHTHALATE	1/8	19	03SW1501	10	6.8	0.3	63.3	1	7
Inorganics (ug/L)									
ALUMINUM	1/8	427	03SW1501	21.2 - 398	109	87	4.9	1	3
BARIUM	8/8	1.9 - 53.3	03SW1501	-	28.6	NA	NA	NA	NA
COPPER	2/8	13 - 15.5	03SW1501	3.19	4.8	6.54	2.4	2	0
IRON	7/8	135 - 3680	03SW0501	131	2373	1000	3.7	6	0
LEAD	2/8	1.9	03SW0301, 03SW1501	1.8	1.2	1.32	1.4	2	6
MANGANESE	8/8	8 - 98.2	03SW0301	-	47.8	NA	NA	NA	NA

Notes

(1) Sample-specific quantitation limits in non-detect samples.

(2) Average concentration of all samples calculated using ½ the detection limit for nondetected samples.

NA = Ecological screening value not available.

µg/L = micrograms per liter.

Iron

Iron was detected in all sediment samples, but there is no USEPA Region 4 ESV for iron in sediment, and no TEC and PEC. The freshwater sediment TEL for iron reported by NOAA is 188,400 mg/kg (Buchman, 1999). All sediment concentrations at Site 3 were less than this value.

Iron concentrations in surface water exceeded the 1,000 µg/L ESV, which is the AWQC, in all five canal samples and in the single Golf Course Pond sample (see Figure 7-2), at a maximum concentration of 3,680 µg/L and an average concentration of 2,373 µg/L (see Table 7-7). Iron was not detected in one of two samples from North Pond, and was less than the ESV in the other pond sample (see Figure 7-2). Iron concentrations were elevated in groundwater, with an average groundwater concentration of 11,600 µg/L and a maximum groundwater concentration of 33,500 µg/L (see Table 4-5 and Appendix C), and so the groundwater data suggest groundwater migration as a potential source of the elevated surface water concentrations. However, surface water iron concentrations also exceeded the ESV in three of six surface water samples collected west of Site 3 as part of the NCBC Gulfport Housing EA, with a maximum concentration of 2,180 µg/L and an average concentration of 1,192 µg/L (see Appendix C). Thus, it is not clear whether the elevated concentrations in the canal and Golf Course Pond are due to regional conditions, groundwater migration from Site 3, an upstream source, or a combination of these.

It should be noted that the Site 3 surface water data are total iron concentrations, not dissolved iron concentrations. Concentrations of dissolved metals, rather than total metals, more closely approximate the bioavailable fraction of metals in the water column (USEPA, 1996a). Because dissolved metals concentrations were not measured in Site 3 surface water, the actual toxicity posed by iron is probably less than that suggested by the maximum HQ of 3.7.

Lead

Lead was not a COPC in sediment (see Table 7-3), so it poses no risk to benthic receptors.

Lead was detected in two of eight surface water samples, at a concentration of 1.9 µg/L in both samples. The 1.32 µg/L ESV was the AWQC when the USEPA Region 4 ESV was promulgated (USEPA, 2001b), but the current AWQC for lead in freshwater surface water is 2.5 µg/L (USEPA, 2004a). Based on the current AWQC, lead in surface water poses no risks to aquatic receptors.

Manganese

There are no USEPA Region 4 surface water or sediment ESVs for manganese, which was detected in all surface water and sediment samples. The freshwater sediment TEL for manganese reported by NOAA is 630 mg/kg (Buchman, 1999). All sediment concentrations at Site 3 were significantly less than this value (see Table 7-5).

The Tier II chronic screening value reported by NOAA is 120 µg/L mg/kg for manganese in surface water (Buchman, 1999). The development of Tier II values follows the methodology described by USEPA (USEPA, 1993c); Tier II values are developed so that aquatic benchmarks can be derived with fewer data than are required for AWQCs. Tier II values are commonly used as screening values in ecological risk assessments. All surface water concentrations at Site 3 were less than 120 µg/L.

Vanadium

Vanadium was detected in all sediment samples, but an ESV and other toxicity thresholds were not available. The maximum and average concentrations in Site 3 sediments (25.4 and 12.2 mg/kg, respectively, Table 7-5) were greater than, but not especially elevated, relative to the maximum and average concentrations (13.8 and 7.8 mg/kg, respectively) in six sediment samples collected west of Site 3 as part of the NCBC Gulfport Housing EA (see Appendix C).

Vanadium was not detected in surface water (at detection limits of 5.89 µg/L). Vanadium was detected in 7 of 24 groundwater samples, and concentrations in groundwater were relatively low, with an overall average groundwater concentration of 8.4 µg/L (see Table 4-5). Vanadium concentrations ranged from 5.1 to 18.8 mg/kg in surface soil and from 2 to 13.8 mg/kg in subsurface soil.

Although the absence of vanadium toxicity data for benthic invertebrates precludes an evaluation of potential risk posed by vanadium in sediment, concentrations were not particularly high and vanadium was not detected in surface water. Furthermore, vanadium concentrations were not elevated in groundwater, and concentrations in soil were lower than sediment concentrations. Therefore, any potential risk posed by vanadium is probably not site related.

7.5.4.2.5 Summary and Conclusions: Sediment and Surface Water

Chemicals initially selected as COPCs in surface water and sediment were further evaluated to determine the likelihood that concentrations pose risk to aquatic and benthic receptors.

Acetone and carbon disulfide were the only VOCs detected in sediment, and acetone was the only VOC detected in surface water. Toxicity data were not available regarding acetone's effects to aquatic and benthic organisms, but acetone concentrations do not appear to be related to Site 3. The potential toxicity of carbon disulfide in sediment cannot be evaluated due to the absence of toxicity thresholds, but it was detected in only 1 of 10 sediment samples.

No SVOCs were detected in sediment, and bis(2-ethylhexyl) phthalate was the only SVOC detected in surface water. It was detected in one of eight surface water samples and does not pose potential risk to aquatic receptors at the site.

Pesticides and PCBs were not detected in surface water. Several organochlorine insecticides and two PCB compounds were detected in sediment. Most pesticides appear to pose negligible risks to benthic receptors. Pesticide and PCB data from samples collected in the forested wetland, North Pond and Golf Course Pond indicate no risks to benthic receptors in these areas. Potential risks to benthic receptors from 4,4'-DDE, 4,4'-DDT, total DDT, and Aroclors (PCBs) in the vicinity of sediment samples SD-01, SD-02, SD-04, and SD-05 cannot be ruled out. Concentrations of these COPCs were highest in sample SD-01, which is the upstream-most sample in Canal No. 1. The source of these compounds in canal samples is uncertain. It is unlikely that the presence of these compounds in SD-01 is due to the former landfill and burning pit.

Concentrations of most metals tended to be low and pose negligible potential risks to aquatic and benthic organisms, or do not appear to be related to former activities at the landfill and burning pit. Iron concentrations in surface water indicate potential risk to aquatic receptors.

7.5.4.3 Potential Risk to Wildlife via the Food Chain

Food-chain modeling was conducted to evaluate potential risks to representative piscivorous receptors from ingested doses of sediment and surface water COPCs that are known to bioaccumulate or biomagnify. As discussed in Sections 7.1.4 and 7.5.2, the former landfill are covered by at least 2 feet of fill dirt within an intensively managed golf course fairway, and the surface soil exposure pathway for upper trophic-level terrestrial receptors such as birds and mammals is incomplete or negligible and insignificant. Thus, food-chain modeling was conducted only for piscivorous wildlife receptors. The methods used to model the doses that representative piscivorous receptors could receive, as well as the selection of toxicity reference values, are presented in Appendix E.

Based on maximum concentrations and conservative assumptions, food-chain HQs exceeded 1.0 for Aroclor-1254, Aroclor-1260, total Aroclors, arsenic, copper, and lead (see Table 7-8). No observed adverse effects levels (NOAEL)-based HQs were highest for Total Aroclors, with an HQ of 2.7 for the mink and an HQ of 2.6 for the green heron. In the average concentration scenario, all food-chain HQs were less than 1.0 (see Table 7-9). All food-chain HQs in Tables 7-8 and 7-9 assume an area use factor of 1.0 (i.e., the representative receptors are assumed to forage exclusively in the water bodies and wetlands near Site 3).

**TABLE 7-8
FOOD CHAIN MODEL - ECOLOGICAL HAZARD QUOTIENTS
PISCIVOROUS RECEPTORS - CONSERVATIVE SCENARIO
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Chemical	Mink HQ_{NOAEL}	Mink HQ_{LOAEL}	Green Heron HQ_{NOAEL}	Green Heron HQ_{LOAEL}
4,4'-DDE	0.2	0.00	0.1	0.01
4,4'-DDT	0.1	0.003	0.1	0.01
Total DDT	0.7	0.02	0.5	0.04
alpha-BHC	0.3	0.03	0.01	0.002
delta-BHC	0.2	0.02	0.01	0.002
alpha-Chlordane	0.003	0.002	0.01	0.002
gamma-Chlordane	0.001	0.0005	0.003	0.001
Aroclor-1254	1.1	0.2	1.03	0.1
Aroclor-1260	1.6	0.3	1.6	0.2
Total Aroclors	2.7	0.5	2.6	0.3
Arsenic	1.2	0.3	0.7	0.3
Copper	1.1	0.1	1.9	0.2
Lead	0.4	0.01	1.4	0.1

Notes:

HQ - Ecological Hazard Quotient; HQs greater than 1.0 are shown in bold.

NOAEL - No Observed Adverse Effects Level

LOAEL - Lowest Observed Adverse Effects Level

**TABLE 7-9
FOOD CHAIN MODEL - ECOLOGICAL HAZARD QUOTIENTS
PISCIVOROUS RECEPTORS - AVERAGE SCENARIO
SITE 3 REMEDIAL INVESTIGATION REPORT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Chemical	Mink HQ_{NOAEL}	Mink HQ_{LOAEL}	Green Heron HQ_{NOAEL}	Green Heron HQ_{LOAEL}
4,4'-DDE	0.03	0.001	0.1	0.01
4,4'-DDT	0.01	0.0003	0.03	0.002
Total DDT	0.1	0.002	0.2	0.01
alpha-BHC	0.1	0.01	0.004	0.001
delta-BHC	0.05	0.005	0.004	0.001
alpha-Chlordane	0.0004	0.0002	0.003	0.001
gamma-Chlordane	0.0002	0.0001	0.001	0.0003
Aroclor-1254	0.1	0.02	0.3	0.03
Aroclor-1260	0.1	0.03	0.4	0.04
Total Aroclors	0.2	0.04	0.5	0.1
Arsenic	0.04	0.01	0.1	0.03
Copper	0.05	0.003	0.2	0.03
Lead	0.01	0.0004	0.1	0.004

Notes:

HQ - Ecological Hazard Quotient.

NOAEL - No Observed Adverse Effects Level

LOAEL - Lowest Observed Adverse Effects Level

Maximum NOAEL-based food-chain HQs for metals in the conservative scenario were 1.2 for arsenic, 1.9 for copper, and 1.4 for lead (see Table 7-8). These values are not particularly high considering the conservative assumptions used in the food-chain model, such as maximum food ingestion rates, minimum body weights, exposure to maximum concentrations, etc. In addition, arsenic concentrations in sediment were within the range reported by Pettry and Switzer (Pettry and Switzer, 2001), so potential risk from arsenic is probably not site related. Copper and lead were not sediment COPCs, and the food-chain HQs greater than 1.0 for these two metals in the conservative scenario are largely a function of the conservative assumptions used in the food-chain model. HQs for arsenic, lead, and copper in the average scenario are significantly less than 1.0 (see Table 7-9).

Aroclor-1254 and Aroclor-1260 were the only PCBs detected in Site 3 sediments and were detected only in samples from Canal No. 1. Maximum NOAEL-based HQs were 1.1 for Aroclor-1254, 1.6 for Aroclor-1260, and 2.7 for total Aroclors (see Table 7-8). These values are not particularly high considering the conservative assumptions used in the food-chain model. Concentrations of both Aroclor-1254 and Aroclor-1260 were highest in sample SD-01, which is the upstream-most sample in Canal No. 1. As discussed in Section 7.5.4.2.3, the presence of these compounds in SD-01 is probably not due to the former landfill and burning pit. If SD-01 is excluded from the data set, maximum concentrations would be 49 µg/kg for Aroclor-1254, 56 µg/kg for Aroclor-1260, and 91 µg/kg for total Aroclors; using these concentrations in the conservative food-chain scenario would result in maximum NOAEL-based food-chain HQs of 0.6 for Aroclor-1254, 0.7 for Aroclor-1260, and 1.1 for total Aroclors. Piscivorous birds and mammals forage over large areas and would obtain only a fraction of their food from the area of Aroclor-contaminated sediment in Canal No. 1. With this in mind, a NOAEL-based HQ of 1.1 (or even 2.7 using total Aroclor concentrations in SD-01) indicates minimal risks to these receptors.

7.6 UNCERTAINTY

Uncertainty is associated with all aspects of the ecological assessment methodology presented in the preceding sections. Some uncertainties were discussed in Section 7.5.4. This section provides a summary of the uncertainties and focuses on those that have not been previously discussed.

The extent to which piscivorous wildlife receptors forage in Canal No. 1 at Site 3 is uncertain. All food-chain HQs in Tables 7-8 and 7-9 and discussed in Section 7.5.4.3 assume an area use factor of 1.0 (i.e., the representative receptors are assumed to forage exclusively in the water bodies and wetlands near Site 3). Due to conditions at Site 3, this assumption is overly conservative for piscivorous receptors. The green heron and mink, as well as other piscivorous bird and mammal species, would probably obtain only a portion of their diet from the canal, resulting in a small exposure to Aroclors, which were

responsible for the highest food-chain HQs. To be conservative, the ecological risk assessment attempted to err on the side of caution, and specific area-use factors were not estimated.

Laboratory-derived NOAELs and lowest-observed-adverse-effects levels (LOAELs) might not adequately represent toxicity thresholds for receptors under field conditions. In addition, NOAELs and LOAELs derived for species used in toxicity tests might not adequately represent toxicity thresholds for other species. These uncertainties may overestimate or underestimate potential risks.

Surface water was not present at the locations of sediment samples SD-07 and SD-08 during sample collection. Sediment is typically characterized as being continuously covered by water, and soil is only occasionally (if ever) covered by water, so these two samples could be categorized as soil rather than sediment. The distinction between sediment and soil is usually significant because sediment screening values are derived to be protective of benthic invertebrates, and soil screening values are derived to be protective of soil-dwelling invertebrates and plants. The two sample locations in question are in a forested wetland where the water table is typically near the ground surface, and frequently saturated conditions result in a substrate more similar to sediment than to soil, so the analytical data from these two samples were included in the sediment data set. Because very few COPCs were detected in these two samples, determining whether these samples more closely represent sediment or soil is of little consequence for the Site 3 evaluation.

Surface water hardness was not measured in Site 3 surface water. Freshwater surface water ESVs for seven metals are based on hardness, and three of those metals (copper, lead, and zinc) were detected in Site 3 surface water. The USEPA Region 4 ESVs used in this evaluation (and shown in Tables 7-2 and 7-7) assume a hardness of 50 mg/L as CaCO₃. Calcium and magnesium concentrations were measured in all eight surface water samples at Site 3, and using the average concentrations of calcium and magnesium in those samples, a hardness value of 49.6 mg/L is obtained using the following equation from APHA:

$$\text{Hardness, mg equivalent CaCO}_3\text{/L} = 2.497 [\text{Calcium, mg/L}] + 4.118 [\text{Manganese, mg/L}]$$

The 49.6 mg/L hardness value closely approximates the 50 mg/L generic value used by USEPA Region 4, so ESVs for copper, lead, and zinc were not adjusted for hardness. The differences in ESVs for hardness values of 50 mg/L versus 49.6 mg/L are inconsequential.

Concentrations of dissolved metals were not measured in Site 3 surface water. Instead, the surface water data are concentrations of total metals. This creates some uncertainty in the evaluation of potential

risks to aquatic life from iron because concentrations of dissolved metals more closely approximate the bioavailable fraction of metals in the water column than concentrations of total metals (USEPA, 1996a).

ESVs and toxicity thresholds were not available for some detected chemicals. For example, invertebrate and plant toxicity data were not available for dinoseb in soil. However, dinoseb was detected in only 1 of 10 samples, which somewhat reduces the inherent uncertainty for this chemical.

Data for investigating toxicity to reptiles and amphibians from oral ingestion of contaminants are sparse. Thus, potential risks via the food chain were not evaluated for reptiles and amphibians.

Soil samples evaluated in this risk assessment consisted of samples no deeper than 1 foot below the soil surface. However, tree roots extend deeper than 1 foot below the surface, and mammals such as moles could burrow deeper than 1 foot. With the exception of moles and trees, terrestrial species at the site would probably not be significantly exposed to soils deeper than 1 foot below the surface, so the uncertainty resulting in evaluating only surface soil is negligible.

The absence of a basewide background data set resulted in uncertainty regarding whether some contaminant concentrations were related to Site 3 or were due to natural and/or anthropogenic background conditions. Surface water and co-located sediment samples collected west of Site 3 as part of the NCBC Gulfport Housing EA were somewhat helpful in this regard. Although the surface water and sediment samples collected for the EA do not represent basewide background conditions, they were nevertheless useful as approximations of surface water and sediment concentrations in nearby areas that have not been impacted by Site 3 contaminants.

A notable uncertainty for this ecological risk assessment is the source of Aroclors, DDT, and DDT-metabolites in sediment samples collected from Canal No. 1. Concentrations of these sediment COPCs were greatest in sample SD-01, which is the upstream-most sample in the canal. Because this sample location is upgradient of Site 3 (relative to surface water runoff and groundwater flow), the presence of these compounds in SD-01 is probably not due to the former landfill and burning pit. Aroclors were not detected in Site 3 surface soil, subsurface soil, or groundwater, so there is a reasonable possibility that Aroclor concentrations in the canal were due to an upstream source or sources. Similar circumstances exist for DDT and its metabolites, but these compounds were detected in Site 3 soil, so their presence in sediment might be site related.

7.7 SUMMARY AND CONCLUSIONS

The former landfill and burning pit at Site 3 encompass approximately 3.5 acres of the Pine Bayou Golf Course in the northern portion of NCBC Gulfport. The former landfill is covered by at least 2 feet of fill dirt and a surface layer of maintained grass. The primary contaminant migration pathway at Site 3 is the infiltration of soil contaminants into groundwater and subsequent seepage into surface water and sediment in Canal No. 1 east of the former landfill and burning pit. Analytical data from surface soil samples collected at the site and sediment and surface water samples collected from nearby water bodies were evaluated in the ecological risk assessment.

7.7.1 Risks to Soil Invertebrates and Plants

VOCs and SVOCs (with the possible exception of caprolactam) in surface soil do not pose risks to ecological receptors. The absence of toxicity data precludes an evaluation of potential impacts to surface soil organisms from caprolactam, which was detected in two surface soil samples.

PCBs were not detected in surface soil. Several organochlorine insecticides were detected in surface soil samples. Concentrations tended to be low, and it is unclear whether their concentrations at Site 3 are due to historical use or to landfill wastes. However, impacts to ecological receptors from these compounds are not expected.

Dinoseb was detected in 1 of 10 surface soil samples and was the only herbicide detected at the site. Surface soil toxicity thresholds have not been established for dinoseb, so there is uncertainty regarding its potential impacts.

Zinc poses potential risk to plants and invertebrates near sample SS-09. Concentrations of other metals at Site 3 tended to be low and pose negligible potential risks to soil invertebrates and plants. Surface soil samples were not collected to the east, south, and southwest of SS-09, so the extent of zinc contamination in those directions is uncertain. This uncertainty supports the use of a soil cover presumptive remedy near sample SS-09 to reduce potential zinc-related risks.

7.7.2 Risks to Benthic Invertebrates and Aquatic Organisms

Acetone and carbon disulfide were the only VOCs detected in sediment, and acetone was the only VOC detected in surface water. Toxicity data were not available regarding acetone's effects on aquatic and benthic organisms, but acetone concentrations do not appear to be related to Site 3. The potential

toxicity of carbon disulfide in sediment cannot be evaluated due to the absence of toxicity thresholds, but it was detected in only 1 of 10 sediment samples.

SVOCs do not pose risks to aquatic and benthic receptors at the site.

Pesticides and PCB compound were not detected in surface water. Several organochlorine insecticides and two PCB compounds were detected in sediment. Most pesticides pose negligible risks to benthic receptors. 4,4'-DDE, 4,4'-DDT, total DDT, and Aroclors (PCBs) pose potential risks to benthic receptors in the vicinity of sediment samples SD-01, SD-02, SD-04, and SD-05. Concentrations of these COPCs were highest in sample SD-01, which is the upstream-most sample in Canal No. 1. The source of these compounds in canal samples is uncertain. It is unlikely that the presence of these compounds in SD-01 is due to the former landfill and burning pit.

Total iron concentrations in surface water indicate potential risk to aquatic receptors, with a maximum screening HQ of 3.7. Concentrations of dissolved iron, which more closely approximate the bioavailable fraction of iron in the water column than total iron, were not measured. The source of the slightly elevated surface water iron concentrations is uncertain, but iron was elevated in Site 3 groundwater. Concentrations of other metals tended to be low and pose negligible potential risks to aquatic and benthic organisms, or do not appear to be related to former activities at the landfill and burning pit.

7.7.3 Risks to Piscivorous Birds and Mammals

Food-chain modeling was conducted to evaluate potential risks to representative piscivorous receptors from ingested doses of sediment and surface water COPCs that are known to bioaccumulate or biomagnify. Screening-level COPCs in Site 3 sediment and surface water that are known to bioaccumulate or biomagnify consisted of 4,4'-DDE, 4,4'-DDT, total DDT, alpha-BHC, delta-BHC, alpha-chlordane, gamma-chlordane, Aroclor-1254, Aroclor-1260, total Aroclor, arsenic, copper, and lead.

Risk via the food chain was evaluated using two scenarios. The first scenario used maximum detected COPC concentrations in sediment and surface water and conservative assumptions for body weight, and food consumption. The second scenario used average COPC concentrations, and less conservative values for body weight and food consumption. Based on maximum sediment and surface water concentrations and conservative assumptions, food-chain HQs slightly exceeded 1.0 for Aroclor-1254, Aroclor-1260, total Aroclors, arsenic, copper, and lead. In the average concentration scenario, all food-chain HQs were less than 1.0. Based on factors discussed in Section 7.5.4.3, site-related impacts to piscivorous receptors from bioaccumulative COPCs in surface water and sediment are not expected.

8.0 SUMMARY AND CONCLUSIONS

The primary objective of the RI was to provide data to evaluate current environmental conditions and guide the selection of a remedy that is protective of human health and the environment for any contamination present at Site 3. To achieve this primary objective, samples from various media were collected and analyzed to fill data gaps from previous investigations.

The following sections summarize the findings of the RI. The screening criteria used to evaluate the nature and extent of contamination in environmental media at Site 3 included the following:

- MDEQ Tier 1 TRGs
- USEPA Region 9 PRGs
- USEPA SSLs for migration to air and groundwater
- USEPA GVCs
- USEPA Region 4 ESVs

The potential impacts of these contaminants to human and ecological receptors were evaluated in the HHRA (based on comparisons to USEPA and State of Mississippi human health benchmarks) and the screening-level ecological risk assessment (based on comparisons to USEPA ESVs).

8.1 SITE HYDROLOGY

The depth to groundwater at Site 3 ranges from about 1 to 7 feet bls and is controlled primarily by surface topography and proximity to Canal No. 1. Groundwater flow direction in the shallow and deep groundwater intervals is generally to the east, towards Canal No. 1. The estimated average groundwater velocity for the shallow zone at the site was calculated at 0.24 foot per day, and the estimated average groundwater velocity for the deep zone at the site was calculated at 0.06 foot per day. Vertical gradients were observed in adjacent pairs of shallow and deep monitoring wells, with upward gradients observed in most of the well pairs.

Two surface water bodies located near the waste disposal area, Golf Course Pond and North Pond, are hydrogeologically upgradient, although North Pond does receive some surface water runoff from the northwestern corner of the site.

8.2 SOIL ASSESSMENT

The release of contaminants at Site 3 most likely resulted from landfill operations. The detection of CVOCs and metals at Site 3 supports the reported disposal of these materials at the site.

Contamination detected in surface soil appears to have resulted from typical golf course maintenance activities and the addition of soil from an unknown source during golf course construction.

Detected VOC concentrations in Site 3 surface soil samples were less than screening criteria. Concentrations of VOCs in subsurface soil were less than direct exposure screening criteria and the SSL for the soil-to-air pathway. Vinyl chloride was detected in one subsurface soil sample at a concentration that exceeded the SSL for the soil-to-groundwater pathway. The presence of CVOCs is consistent with waste disposal practices and base operations that have included the use of solvents in degreasing activities, particularly the degreasing of new military equipment from manufacturers.

PAH concentrations exceeding screening criteria were limited to three surface soil sample locations. The relatively low concentration of PAHs and lack of site-wide occurrence suggest that the existing soil cover over most of the disposal area prevents direct exposure to landfill material. Detected SVOC concentrations in the subsurface soil samples were less than screening criteria.

Pesticides were detected in Site 3 surface and subsurface soil samples at concentrations less than direct exposure human health criteria. The pesticide concentrations were consistent with the use and/or disposal of small quantities of DDT, BHC isomers, and dieldrin. Concentrations of PCBs were less than standard laboratory detection limits.

Herbicide concentrations in surface and subsurface soil samples were less than standard laboratory detection limits. The primary HO ingredients (the herbicides 2,4-D and 2,4,5-T) were not detected in any of the samples, indicating that HO was not significantly used or disposed of at Site 3, which is consistent with the time frame of landfill operations at Site 3 and the storage of HO at the base.

Arsenic was detected in each of the 10 soil samples and was the only metal detected in surface soil samples collected at Site 3 with concentrations exceeding human health direct exposure criteria. The arsenic concentrations were within concentration ranges typical for Mississippi Coastal Flatwoods soil. Concentrations of other metals detected in surface soil at Site 3 did not exceed screening criteria for direct exposures to human receptors, but did exceed SSLs for the soil-to-groundwater migration pathway and/or ESVs for ecological receptors.

Arsenic was detected in two subsurface soil samples and was the only metal detected in subsurface soil samples with concentrations exceeding human health direct exposure criteria. Subsurface soil arsenic concentrations were within concentration ranges typical for Mississippi Coastal Flatwoods soil. Concentrations of aluminum and chromium detected at Site 3 did not exceed screening criteria for direct exposures to human receptors but did exceed SSLs for the soil-to-groundwater migration pathway.

The results of the soil analytical program are consistent with the containment strategy of the presumptive remedy, and the direct observation of the field samples confirmed the waste disposal area defined by the geophysical investigation.

The containment presumptive remedy strategy for Site 3 includes the installation and maintenance of a soil cover system. Strategically covering the existing surface will remove important exposure pathways including direct exposure to surface soil by ecological receptors, potential leaching of contaminants from soil to groundwater, and erosion and transport of surface soil from the landfill. Direct exposure to subsurface soil will be prevented by institutional controls established to maintain the integrity of the cover. Data from grain size analyses for soil samples collected at Site 4, which has similar cover material to Site 3, indicate that the golf course fill material installed over the landfill ranges from 70 to 79 percent sand and only 6 to 12 percent clay. Hydraulic conductivities in this material ranged from 1.2×10^{-4} to 7.9×10^{-5} centimeters per second.

8.3 GROUNDWATER ASSESSMENT

Groundwater characterization samples collected at Site 3 were analyzed for TCL, TAL, and Appendix IX analytes. Groundwater delineation samples were collected using DPT and analyzed for selected VOCs.

A dissolved CVOC plume was delineated at Site 3. Concentrations of vinyl chloride, cis-1,2-DCE, trans-1,2-DCE, and TCE in groundwater exceeded Tier 1 TRGs. The plume appears to have an area of approximately 90,000 square feet. Comparison of analytical data from shallow and deep well pairs indicate that the CVOC plume is limited to the uppermost sand zone of the shallow surficial aquifer, to a depth of approximately 24 feet, and has not migrated vertically.

Data suggest that the phenomena known as DCE stall has occurred in the dissolved CVOC plume at Site 3. DCE stall in groundwater systems results when insufficient electron acceptors or substrates or adverse environmental conditions prevent further biologically mediated reductive dechlorination of VOCs.

Detected SVOC concentrations were less than screening criteria. Pesticide and PCB concentrations in groundwater samples submitted for off-site laboratory analysis were less than standard laboratory detection limits. Herbicide concentrations in groundwater samples were less than standard laboratory detection limits.

An arsenic plume was detected in nine wells in the southern part of the site. The elevated arsenic concentrations occurred upgradient of the landfill and do not appear to be related to waste disposal activities. Elevated iron concentrations were also observed in the majority of the wells with elevated arsenic concentrations. Aluminum, lead, and vanadium exceedances occurred in one monitoring well located adjacent to North Pond, upgradient of the landfill. Thallium was detected in one groundwater sample from a deep well, the only screening criteria exceedance detected in a deep well. The presence of the CVOC plume beyond the boundary of the waste disposal area will require additional treatment in addition to the presumptive remedy containment strategy for the landfill.

The interaction between the layers of silt and sandy clay and the contaminants at the site appears to have created a vertical barrier to migration. Although not a true aquaclude, these lower permeable layers restrict the movement of contaminants such that the containment strategy of a soil cover should be effective in reducing future migration of contaminants and will be evaluated in the FS.

8.4 SURFACE WATER AND SEDIMENT ASSESSMENT

Detected VOC concentrations in Site 3 surface water and sediment samples were less than screening criteria.

Bis(2-ethylhexyl) phthalate was detected in the surface water sample from Golf Course Pond at a concentration greater than the screening criteria. Concentrations of other SVOCs in surface water samples were less than standard laboratory detection limits. Concentrations of SVOCs in sediment samples from Site 3 were less than the laboratory detection limits, some of which were elevated due to matrix interference.

Concentrations of pesticides and PCBs in surface water samples were less than standard laboratory detection limits. The concentrations of DDE, DDT, total DDD/DDE/DDT, alpha-chlordane, gamma-chlordane, and total Aroclors in sediment were less than human health screening criteria; however, concentrations of each of these analytes exceeded ESVs in one or more samples. The maximum concentrations of DDE, DDT and PCBs were detected in the furthest upstream sample collected from Canal No. 1.

Herbicide concentrations in surface water and sediment samples were less than standard laboratory detection limits. The primary HO ingredients (the herbicides 2,4-D and 2,4,5-T) were not detected in any of the samples.

Iron, lead, copper, and aluminum were detected in one or more surface water samples at concentrations greater than ESVs but less than human health criteria. Arsenic was detected in sediment samples collected from Canal No. 1 and one sample from North Pond and was the only metal detected in Site 3 sediment samples at concentrations exceeding screening criteria. The arsenic concentrations were within concentration ranges typical for Mississippi Coastal Flatwoods soil.

Analytical results for surface water and sediment samples collected from water bodies not directly associated with Site 3 indicated the presence of the same contaminants detected at Site 3. Bis(2-ethylhexyl) phthalate was detected in one sample from Boy Scout Lake. Aluminum, copper, iron, and lead were detected in one or more of these surface water samples at concentrations similar to those in the surface water samples collected at Site 3. Arsenic was detected in sediment samples at concentrations similar to those found at Site 3. These results suggest that the contaminant levels reported in Site 3 surface water and sediment samples reflect base-wide conditions and do not result from releases from the landfill at Site 3.

8.5 MEDIA TO AIR MIGRATION PATHWAY

Air samples were not collected from Site 3 during the RI because the concentrations of volatile contaminants previously detected in soil and groundwater were relatively low. Air monitoring for workers was conducted as part of the site investigation activities as a health and safety precaution to identify potential exposure to concentrations of volatile contaminants.

To determine the potential for migration of soil contaminants to the atmosphere, contaminant concentrations were compared to USEPA SSLs. SSLs have been established for various volatiles, pesticides/PCBs, and metals. Concentrations of these classes of analytes that were detected in soil at Site 3 were less than the default SSL values.

USEPA GVCs have been established for many of the VOCs detected in groundwater at Site 3. Benzene, chloromethane, cis-1,2-DCE, TCE, and vinyl chloride were detected in one or more groundwater samples at concentrations greater than the default criteria, indicating the potential for migration and accumulation of vapors from the groundwater into the atmosphere.

8.6 HUMAN HEALTH RISK ASSESSMENT

An HHRA was performed to evaluate exposure to COPCs in surface and subsurface soil, groundwater, surface water, and sediment at Site 3. Estimated risks for site maintenance workers, construction/excavation workers, adult trespassers, and adolescent trespassers assumed to be exposed to COPCs in site media were less than or equal to USEPA and MDEQ risk benchmarks. Cancer risk estimates developed for lifelong trespassers and industrial workers exposed to soil exceed the MDEQ cumulative risk benchmark. However, it is likely that a significant amount of the arsenic (which accounts for the highest percent of the risk estimates) present is naturally occurring. Additionally, the industrial and lifelong trespasser exposure scenarios are extremely conservative, thus the numerical risk results for these receptors are likely overestimated.

The quantitative risk evaluation also indicated that potential adverse health effects may be associated with the hypothetical future residential use of groundwater, and the cancer risk estimate for the future resident exposed to soil exceeds the MDEQ cumulative cancer risk benchmark. The maximum detected concentrations of several VOCs and arsenic in groundwater exceeded USEPA MCLs and MDEQ TRGs. However, there is also considerable uncertainty in the risk estimates calculated for exposure to COPCs in groundwater and soil, and the numerical risk results are likely overestimated. It is important to note that the residential land use scenario is evaluated primarily to provide information to risk managers for Site 3. The groundwater underlying and downgradient of Site 3 is not currently used as a source of drinking water, and there are no plans to develop this resource or the Site 3 area for residential purposes in the future. Residential risks estimated for other site media (subsurface soil, surface water, and sediment) did not exceed USEPA risk benchmarks.

8.7 ECOLOGICAL RISK ASSESSMENT

Concentrations of a number of contaminants in Canal No. 1 sediment and surface water were elevated relative to conservative screening levels and associated with potential risk to ecological receptors. The detected contaminants, although possibly associated with Site 3, may also have been transported from other areas of NCBC Gulfport via storm water runoff through ditches that connect to Canal No. 1. When conservative assumptions used in the ecological risk assessment are re-evaluated and factors that affect potential exposures, such as quality and size of the habitat and actual use of the site by modeled receptors are considered, the overall level of ecological risk associated with the cited contamination in Canal No. 1 is considered minimal.

Risks to Soil Invertebrates and Plants

VOCs and SVOCs in surface soil do not pose risks to ecological receptors

Several organochlorine insecticides were detected in surface soil samples. Concentrations tended to be low, and impacts to ecological receptors from these compounds are not expected.

Dinoseb was detected in 1 of 10 surface soil samples and was the only herbicide detected at the site. Surface soil toxicity thresholds have not been established for dinoseb, so there is uncertainty regarding its potential impacts.

Zinc poses potential risk to plants and invertebrates near sample SS-09. Concentrations of other metals at Site 3 tended to be low and pose negligible potential risks to soil invertebrates and plants. This supports the use of the soil cover presumptive remedy near sample SS-09 to reduce potential zinc-related risks.

Risks to Benthic Invertebrates and Aquatic Organisms

Acetone and carbon disulfide were the only VOCs detected in sediment, and acetone was the only VOC detected in surface water. Toxicity data were not available regarding acetone's effects on aquatic and benthic organisms, but acetone concentrations do not appear to be related to Site 3. The potential toxicity of carbon disulfide in sediment cannot be evaluated due to the absence of toxicity thresholds, but it was detected in only 1 of 10 sediment samples.

SVOCs do not pose risks to aquatic and benthic receptors at the site.

Pesticides and PCB compound were not detected in surface water. Several organochlorine insecticides and two PCB compounds were detected in sediment. Most pesticides pose negligible risks to benthic receptors. 4,4'-DDE, 4,4'-DDT, total DDT, and Aroclors (PCBs) pose potential risks to benthic receptors in the vicinity of sediment samples SD-01, SD-02, SD-04, and SD-05. Concentrations of these COPCs were highest in sample SD-01, which is the upstream-most sample in Canal No. 1. The source of these compounds in canal samples is uncertain. It is unlikely that the presence of these compounds in SD-01 is due to the former landfill and burning pit.

Total iron concentrations in surface water indicate potential risk to aquatic receptors. The source of the slightly elevated surface water iron concentrations is uncertain, but iron was elevated in Site 3 groundwater. Concentrations of other metals tended to be low and pose negligible potential risks to aquatic and benthic organisms, or do not appear to be related to former activities at the landfill and burning pit.

Risks to Piscivorous Birds and Mammals

Food-chain modeling was conducted to evaluate potential risks to representative piscivorous receptors from ingested doses of sediment and surface water COPCs that are known to bioaccumulate or biomagnify. Based on maximum sediment and surface water concentrations and conservative assumptions, food-chain HQs slightly exceeded 1.0 for Aroclor-1254, Aroclor-1260, total Aroclors, arsenic, copper, and lead. In the average concentration scenario, all food-chain HQs were less than 1.0. Site-related impacts to piscivorous receptors from bioaccumulative COPCs in surface water and sediment are not expected.

8.8 CONCLUSIONS

Contaminants were detected in Site 3 groundwater at concentrations exceeding MDEQ risk-based screening criteria. The CVOC plume is limited to the south-central part of the site. Contaminants were also detected in site surface soil exceeding MDEQ risk-based screening criteria for unrestricted site use.

The HHRA identified risk to human receptors (site residents only) exposed to site groundwater exceeding USEPA and MDEQ benchmarks. Estimated risks for site workers, occupational workers, construction/excavation workers, and trespassers/recreational users assumed to be exposed to site media were less than or within USEPA and MDEQ risk benchmarks. The screening-level ecological risk assessment indicated that risk to ecological receptors did not exceed USEPA and MDEQ benchmarks.

The CVOC plume in Site 3 groundwater will require measures to eliminate or minimize exposure by active cleanup, engineering controls, and/or institutional controls beyond those prescribed by the presumptive remedy.

Based on the results of the RI, an FS using CERCLA guidelines is recommended for Site 3. As discussed throughout this report, Site 3 meets the requirements of the presumptive remedy framework for municipal and military landfills. Therefore, the primary remedial strategy for Site 3 will be containment of the disposal area with a soil cap meeting State of Mississippi (MDEQ), and USEPA requirements to prevent exposure to site soil.

The containment strategy should focus on three areas: (1) soil cover to prevent direct exposure to landfill materials; (2) elimination of the potential for mechanical disturbance of the cover during golf course operations; and (3) minimization of erosion of surface soil into Canal No. 1.

Based on the locations and types of chemicals detected during this investigation, interim removal or time-critical actions will not be required. After the above actions are taken, there will be a low likelihood

for the migration of contaminated media, and the local population will not be exposed to contaminants in subsurface soil and groundwater at the site if current base operations and restrictions are maintained.

The FS will incorporate the presumptive remedy strategy including the soil cover to prevent recontamination in the future. The current soil cover is not likely to be adequate for permanent site closure under either MDEQ or USEPA regulations. Long-term monitoring and maintenance of the soil cover will be required.

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APPENDIX A

SOIL GAS SURVEY REPORTS



W. L. GORE & ASSOCIATES, INC.

100 CHESAPEAKE BLVD., P.O. BOX 10 • ELKTON, MARYLAND 21922-0010
PHONE: 410/392-7600 • FAX: 410/506-4780

GORE™ EXPLORATION SURVEY
GORE™ ENVIRONMENTAL SURVEY

GORE™ Surveys Final Report

Site 3/NCBC
Gulfport, MS

September 6, 2006

Prepared For:
Tetra Tech NUS
3360 Capital Circle NE, Suite B
Tallahassee, FL, 32308

W.L. Gore & Associates, Inc.

Written/Submitted by:
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Jim E. Whetzel, Project Manager

Analytical Data Reviewed by:
Dayna Cobb, Chemist





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GORE™ Surveys - Final Report

REPORT DATE: 09/06/2006

AUTHOR: JWH

SITE INFORMATION

Site Reference: Site 3/NCBC, Gulfport, MS

Gore Production Order Number: 12792893

Gore Site Code: DKG

FIELD PROCEDURES

Modules shipped: 105

Installation Date(s): 7-25,28,29-2006

Modules Installed: 96

Field work performed by: Tetra Tech NUS

Retrieval date(s): 8-8-2006

Modules Retrieved: 96

Modules Lost in Field: 0

Modules Not Returned: 6

Exposure Time: 12-14 [days]

Trip Blanks Returned: 3

Unused Modules Returned: 0

Date/Time Received by Gore: 8/10/2006 4:40:00 PM **By:** CW

Chain of Custody Form attached: Yes

Chain of Custody discrepancies: None

Comments:

Modules #502183, -231, and -236 were identified as trip blanks.

Modules #502178, -237, -238, -239, and -240 were noted as 'destroyed' and not returned.

Module #502233 was listed on the installation log as installed and retrieved, but was not returned.

GORE™ Surveys - Final Report

ANALYTICAL PROCEDURES

W.L. Gore & Associates' Screening Module Laboratory operates under the guidelines of its Quality Assurance Manual, Operating Procedures and Methods. The quality assurance program is consistent with Good Laboratory Practices (GLP) and ISO Guide 25, "General Requirements for the Competence of Calibration and Testing Laboratories", third edition, 1990.

Instrumentation consists of state of the art gas chromatographs equipped with mass selective detectors, coupled with automated thermal desorption units. Sample preparation simply involves cutting the tip off the bottom of the sample module and transferring one or more exposed sorbent containers (sorbents, each containing engineered adsorbents) to a thermal desorption tube for analysis. Sorbents remain clean and protected from dirt, soil, and ground water by the insertion/retrieval cord, and require no further sample preparation.

Analytical Method Quality Assurance:

The analytical method employed is a modified EPA method 8260/8270. Before each run sequence, two instrument blanks, a sorbent containing 5 μ g BFB (Bromofluorobenzene), and a method blank are analyzed. The BFB mass spectra must meet the criteria set forth in the method before samples can be analyzed. A method blank and a sorbent containing BFB is also analyzed after every 30 samples and/or trip blanks. Standards containing the selected target compounds at five calibration levels are analyzed at the beginning of each run. The criterion for each target compound is less than 25% RSD (relative standard deviation). If this criterion is not met for any target compound, the analyst has the option of generating second- or third-order standard curves, as appropriate. A second-source reference standard, at a level of 10 μ g per target compound, is analyzed after every ten samples and/or trip blanks, and at the end of the run sequence. Positive identification of target compounds is determined by 1) the presence of the target ion and at least two secondary ions; 2) retention time versus reference standard; and, 3) the analyst's judgment.

NOTE: All data have been archived. Any replicate sorbents not used in the initial analysis will be discarded fifteen (15) days from the date of analysis.

Laboratory analysis: thermal desorption, gas chromatography, mass selective detection

Instrument ID: # 5 **Chemist:** DC\KH

Compounds/mixtures requested: A1

Deviations from Standard Method: None

Comments: Soil vapor analytes and abbreviations are tabulated in the Data Table Key (page 6).

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DATA TABULATION

CONTOUR MAPS ENCLOSED: Five (5) B-sized color contour maps

LIST OF MAPS ENCLOSED:

- Tetrachloroethene (PCE)
- Trichloroethene (TCE)
- cis- & trans-1,2-Dichloroethene (c,t-1,2-DCE)
- Benzene, Toluene, Ethyl benzene, and total Xylenes (BTEX)
- Total Petroleum Hydrocarbons (TPH)

NOTE: All data values presented in Appendix A represent masses of compound(s) desorbed from the GORE™ Modules received and analyzed by W.L. Gore & Associates, Inc., as identified in the Chain of Custody (Appendix A). The measurement traceability and instrument performance are reproducible and accurate for the measurement process documented. Semi-quantitation of the compound mass is based on a five-level standard calibration.

General Comments:

- This survey reports soil gas mass levels present in the vapor phase. Vapors are subject to a variety of attenuation factors during migration away from the source concentration to the module. Thus, mass levels reported from the module will often be less than concentrations reported in soil and groundwater matrix data. In most instances, the soil gas masses reported on the modules compare favorably with concentrations reported in the soil or groundwater (e.g., where soil gas levels are reported at greater levels relative to other sampled locations on the site, matrix data should reveal the same pattern, and vice versa). However, due to a variety of factors, a perfect comparison between matrix data and soil gas levels can rarely be achieved.
- Soil gas signals reported by this method cannot be identified specifically to soil adsorbed, groundwater, and/or free-product contamination. The soil gas signal reported from each module can evolve from all of these sources. Differentiation between soil and groundwater contamination can only be achieved with prior knowledge of the site history (i.e., the site is known to have groundwater contamination only).
- QA/QC trip blank modules were provided to document potential exposures that were not part of the soil gas signal of interest (i.e., impact during module shipment, installation and retrieval, and storage). The trip blanks are identically manufactured and packaged soil gas modules to those modules placed in the subsurface. However, the trip blanks remain unopened during all phases of the soil gas survey. Levels reported on the trip blanks may indicate potential impact to modules other than the contaminant source of interest.

GORE™ Surveys - Final Report

- Unresolved peak envelopes (UPEs) are represented as a series of compound peaks clustered together around a central gas chromatograph elution time in the total ion chromatogram. Typically, UPEs are indicative of complex fluid mixtures that are present in the subsurface. UPEs observed early in the chromatogram are considered to indicate the presence of more volatile fluids, while UPEs observed later in the chromatogram may indicate the presence of less volatile fluids. Multiple UPEs may indicate the presence of multiple complex fluids.
- Stacked total ion chromatograms (TICs) are included in Appendix A. The six-digit serial number of each module is incorporated into the TIC identification (e.g.: 123456S.D represents module #123456).

Project Specific Comments:

- The minimum (gray) contour level, for each mapped analyte or group of analytes, was set at the maximum blank level observed or the method detection limit, whichever was greater. When target compounds are summed together (i.e., BTEX), the contour minimum is arbitrarily set at 0.02 μg or the maximum blank level, whichever is greater. The maximum contour level was set at the maximum value observed.
- Background levels of TPH were detected on the trip blanks and/or the method blanks. No other target compounds were observed on the QA blanks. Thus, target analyte levels reported for the field-installed modules that exceed trip and method blank levels, and the analyte method detection limit, are more likely to have originated from on-site sources.
- Elevated levels of TPH and several chlorinated compounds were observed. The mapped spatial patterns revealed both “hot spots” and fairly well-defined soil gas plumes across the area sampled.
- If the objective of the soil gas survey was to delineate the nature and extent of the contamination, then additional soil gas sampling is recommended in those areas where the color contours appear to extend into unsampled areas. Subsequent sampling events can be combined with the data from this event and mapped together to provide greater coverage.

GORE™ Surveys - Final Report

KEY TO DATA TABLE Site3/NCBC, Gulfport, MS

UNITS

µg	micrograms (per sorber), reported for compounds
MDL	method detection limit
bdl	below detection limit
nd	non-detect

ANALYTES

BTEX	combined masses of benzene, toluene, ethylbenzene and total xylenes (Gasoline Range Aromatics)
BENZ	benzene
TOL	toluene
EtBENZ	ethylbenzene
mpXYL	m-, p-xylene
oXYL	o-xylene
C11,C13&C15	combined masses of undecane, tridecane, and pentadecane (C11+C13+C15) (Diesel Range Alkanes)
UNDEC	undecane
TRIDEC	tridecane
PENTADEC	pentadecane
TMBs	combined masses of 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene
135TMB	1,3,5-trimethylbenzene
124TMB	1,2,4-trimethylbenzene
ct12DCE	cis- & trans-1,2-dichloroethene
t12DCE	trans-1,2-dichloroethene
c12DCE	cis-1,2-dichloroethene
NAPH&2-MN	combined masses of naphthalene and 2-methyl naphthalene
Combined PAHs	combined masses of naphthalene, 2-methyl naphthalene, acenaphthene, acenaphthylene, fluorene, phenanthrene, anthracene, fluoranthene, and pyrene.
NAPH	naphthalene
2MeNAPH	2-methyl naphthalene
MTBE	methyl t-butyl ether
PHEN	phenanthrene
11DCA	1,1-dichloroethane
CHCl ₃	chloroform
111TCA	1,1,1-trichloroethane
12DCA	1,2-dichloroethane
CCl ₄	carbon tetrachloride
TCE	trichloroethene
OCT	octane
PCE	tetrachloroethene
CIBENZ	chlorobenzene
14DCB	1,4-dichlorobenzene

BLANKS

TBn	unexposed trip blanks, travels with the exposed modules
method blank	QA/QC module, documents analytical conditions during analysis

APPENDIX A:

1. CHAIN OF CUSTODY
2. DATA TABLE
3. STACKED TOTAL ION CHROMATOGRAMS
4. COLOR CONTOUR MAPS

GORE-SORBER® Screening Survey Chain of Custody

For W.L. Gore & Associates use only
Production Order # 12792893



W. L. Gore & Associates, Inc., Survey Products Group

100 Chesapeake Boulevard • Elkton, Maryland 21921 • Tel: (410) 392-7600 • Fax (410) 506-4780

Instructions: Customer must complete ALL shaded cells

Customer Name: <u>TETRA TECH NUS</u>		Site Name: <u>NCBC NAVY</u>	
Address: <u>FOSTER PLAZA VII 661 ANDERSON DR</u> <u>PITTSBURGH PA</u> <u>USA</u>		Site Address: <u>GULFPORT MS</u>	
Phone: <u>650 559 1692</u>		Project Manager: <u>ROBERT FISHER</u>	
FAX: _____		Customer Project No.: _____	
		Customer P.O. #: <u>1009775</u> Quote #: _____	
Serial # of Modules Shipped		# of Modules for Installation <u>100</u> # of Trip Blanks <u>5</u>	
# 502136 - # 502195	# - #	Total Modules Shipped: <u>105</u> Pieces	
# 502196 - # 502240	# - #	Total Modules Received: <u>105</u> Pieces	
# <u>502136</u> - # <u>502177</u>	# - #	Total Modules Installed: <u>96 (3 trips) = 99</u> Pieces	
# 502179 - # 502232	# - #	Serial # of Trip Blanks (Client Decides) #	
# 502234 - # 502236	# - #	# <u>502236</u>	#
# - #	# - #	# <u>502231</u>	#
# - #	# - #	# <u>502183</u>	#
# - #	# - #	#	#
# - #	# - #	#	#
# - #	# - #	#	#
# - #	# - #	#	#
Prepared By: <u>Martine G. Kennedy</u>	#	#	#
Verified By: <u>Clara W. White</u>	#	#	#
Installation Performed By:		Installation Method(s) (circle those that apply):	
Name (please print): <u>Jason Bourgeois</u>		Slide Hammer Hammer Drill <u>Auger</u>	
Company/Affiliation: <u>TetraTech</u>		Other: _____	
Installation Start Date and Time: <u>07/25/06</u> <u>1</u> <u>18:06</u> AM <u>PM</u>			
Installation Complete Date and Time: 07/25/06 <u>10/29/06</u> <u>08:25</u> AM <u>PM</u>			
Retrieval Performed By:		Total Modules Retrieved: _____ Pieces	
Name (please print): <u>Jason Bourgeois</u>		Total Modules Lost in Field: _____ Pieces	
Company/Affiliation: <u>TetraTech</u>		Total Unused Modules Returned: _____ Pieces	
Retrieval Start Date and Time: <u>08/08/06</u> <u>08:05</u> AM <u>PM</u>			
Retrieval Complete Date and Time: <u>08/08/06</u> <u>09:49</u> AM <u>PM</u>			
Relinquished By _____	Date _____	Time _____	Received By: _____
Affiliation: <u>W.L. Gore & Associates, Inc.</u>			Date _____
Relinquished By <u>Martine G. Kennedy</u>	Date <u>7/6/06</u>	Time <u>9:30</u>	Received By: _____
Affiliation: _____			Affiliation: _____
Relinquished By <u>[Signature]</u>	Date _____	Time _____	Received By: <u>Clara W. White</u>
Affiliation: _____	<u>08/09/06</u>	<u>15:00</u>	Date <u>8/10/06</u> Time <u>16:40</u>

GORE-SORBER® Screening Survey
Installation and Retrieval Log

SITE NAME & LOCATION

Site 3 / NCBC Bulkport

Page 1 of 3

LINE #	MODULE #	INSTALLATION DATE/TIME	RETRIEVAL DATE/TIME	EVIDENCE OF LIQUID HYDROCARBONS (LPH) or HYDROCARBON ODOR (Check as appropriate)			MODULE IN WATER (check one)		COMMENTS
				LPH	ODOR	NONE	YES	NO	
1.	502136	7/25 1806	08/08 0805			X		X	
2.	502137	7/25 1817	08/08 0807			X		X	
3.	502138	07/25 1822	08/08 0809			X		X	
4.	502139	07/25 1827	08/08 0810			X		X	
5.	502140	07/25 1831	08/08 0811			X		X	
6.	502141	07/25 1842	08/08 0812			X	X		
7.	502142	07/27 0900	08/08 0813			X		X	
8.	502143	07/27 0902	08/08 0814			X	X		
9.	502144	07/27 0906	08/08 0815			X		X	
10.	502145	07/27 0927	08/08 0816			X		X	
11.	502146	07/27 0931	08/08 0817			X	X		
12.	502147	07/27 0937	08/08 0819			X		X	
13.	502148	07/27 0952	08/08 0820			X		X	
14.	502149	07/27 0955	08/08 0821			X		X	
15.	502150	07/27 1000	08/08 0822			X		X	
16.	502151	07/27 1003	08/08 0823			X		X	
17.	502152	07/27 1008	08/08 0824			X		X	
18.	502153	07/27 1010	08/08 0825			X		X	
19.	502154	07/27 1015	08/08 0827			X		X	
20.	502155	07/27 1018	08/08 0828			X		X	
21.	502156	07/27 1019	08/08 0829			X		X	
22.	502157	07/27 1022	08/08 0830			X		X	
23.	502158	07/27 1026	08/08 0831			X		X	
24.	502159	07/27 1035	08/08 0832			X		X	
25.	502160	07/27 1039	08/08 0832			X		X	
26.	502161	07/27 1042	08/08 0833			X		X	
27.	502162	07/27 1045	08/08 0835			X		X	
28.	502163	07/27 1047	08/08 0836			X		X	
29.	502164	07/27 1050	08/08 0837			X		X	
30.	502165	07/27 1055	08/08 0837			X		X	
31.	502166	07/27 1112	08/08 0838			X		X	
32.	502167	07/27 1116	08/08 0838			X		X	
33.	502168	07/27 1119	08/08 0839			X		X	
34.	502169	07/27 1123	08/08 0840			X		X	
35.	502170	07/27 1128	08/08 0841			X		X	
36.	502171	07/27 1130	08/08 0842			X		X	
37.	502172	07/27 1134	08/08 0843			X		X	
38.	502173	07/27 1136	08/08 0844			X		X	
39.	502174	07/27 1137	08/08 0845			X		X	
40.	502175	07/27 1138	08/08 0846			X		X	
41.	502176	07/27 1140	08/08 0847			X		X	
42.	502177	07/27 1142	08/08 0848			X		X	

**GORE-SORBER® Screening Survey
Installation and Retrieval Log**

SITE NAME & LOCATION

Site 3 / NE BC Gulfport

Page 2 of 3

LINE #	MODULE #	INSTALLATION DATE/TIME	RETRIEVAL DATE/TIME	EVIDENCE OF LIQUID HYDROCARBONS (LPH) or HYDROCARBON ODOR (Check as appropriate)			MODULE IN WATER (check one)		COMMENTS
				LPH	ODOR	NONE	YES	NO	
43.	502178								Destroyed
44.	502179	<i>07/28 0720</i>	<i>08/08 0850</i>						
45.	502180	<i>07/28 0725</i>	<i>08/08 0852</i>						
46.	502181	<i>07/28 0730</i>	<i>08/08 0853</i>						
47.	502182	<i>07/28 0735</i>	<i>08/08 0855</i>						
48.	502183								Trip Blank
49.	502184	<i>07/28 0740</i>	<i>08/08 0857</i>						
50.	502185	<i>07/28 0745</i>	<i>08/08 0858</i>						
51.	502186	<i>07/28 0750</i>	<i>08/08 0858</i>						
52.	502187	<i>07/28 0800</i>	<i>08/08 0900</i>						
53.	502188	<i>07/28 0805</i>	<i>08/08 0902</i>						
54.	502189	<i>07/28 0810</i>	<i>08/08 0904</i>						
55.	502190	<i>07/28 0815</i>	<i>08/08 0903</i>						
56.	502191	<i>07/28 0820</i>	<i>08/08 0907</i>						
57.	502192	<i>07/28 0825</i>	<i>08/08 0909</i>						
58.	502193	<i>07/28 0830</i>	<i>08/08 0908</i>						
59.	502194	<i>07/28 0835</i>	<i>08/08 0910</i>						
60.	502195	<i>07/28 0840</i>	<i>08/08 0911</i>						
61.	502196	<i>07/28 0845</i>	<i>08/08 0912</i>						
62.	502197	<i>07/28 0850</i>	<i>08/08 0913</i>						
63.	502198	<i>07/28 0855</i>	<i>08/08 0915</i>						
64.	502199	<i>07/28 0900</i>	<i>08/08 0916</i>						
65.	502200	<i>07/28 0905</i>	<i>08/08 0917</i>						
66.	502201	<i>07/29 0540</i>	<i>08/08 0918</i>						
67.	502202	<i>07/29 0545</i>	<i>08/08 0919</i>						
68.	502203	<i>07/29 0550</i>	<i>08/08 0920</i>						
69.	502204	<i>07/29 0555</i>	<i>08/08 0921</i>						
70.	502205	<i>07/29 0600</i>	<i>08/08 0922</i>						
71.	502206	<i>07/29 0605</i>	<i>08/08 0923</i>						
72.	502207	<i>07/29 0610</i>	<i>08/08 0924</i>						
73.	502208	<i>07/29 0615</i>	<i>08/08 0925</i>						
74.	502209	<i>07/29 0620</i>	<i>08/08 0926</i>						
75.	502210	<i>07/29 0625</i>	<i>08/08 0927</i>						
76.	502211	<i>07/29 0630</i>	<i>08/08 0928</i>						
77.	502212	<i>07/29 0635</i>	<i>08/08 0929</i>						
78.	502213	<i>07/29 0640</i>	<i>08/08 0930</i>						
79.	502214	<i>07/29 0645</i>	<i>08/08 0931</i>						
80.	502215	<i>07/29 0650</i>	<i>08/08 0932</i>						
81.	502216	<i>07/29 0655</i>	<i>08/08 0933</i>						
82.	502217	<i>07/29 0700</i>	<i>08/08 0933</i>						
83.	502218	<i>07/29 0705</i>	<i>08/08 0934</i>						
84.	502219	<i>07/29 0710</i>	<i>08/08 0935</i>						

**GORE-SORBER® Screening Survey
Installation and Retrieval Log**

SITE NAME & LOCATION

SAs3 / NC 13 C Gulfport

Page 3 of 3

LINE #	MODULE #	INSTALLATION DATE/TIME	RETRIEVAL DATE/TIME	EVIDENCE OF LIQUID HYDROCARBONS (LPH) or HYDROCARBON ODOR (Check as appropriate)			MODULE IN WATER (check one)		COMMENTS
				LPH	ODOR	NONE	YES	NO	
85.	502220	<i>07/29 0715</i>	<i>08/08 0936</i>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
86.	502221	<i>07/29 0720</i>	<i>08/08 0937</i>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
87.	502222	<i>07/29 0725</i>	<i>08/08 0938</i>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
88.	502223	<i>07/29 0730</i>	<i>08/08 0939</i>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
89.	502224	<i>07/29 0735</i>	<i>08/08 0940</i>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
90.	502225	<i>07/29 0740</i>	<i>08/08 0941</i>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
91.	502226	<i>07/29 0745</i>	<i>08/08 0942</i>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
92.	502227	<i>07/29 0750</i>	<i>08/08 0942</i>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
93.	502228	<i>07/29 0755</i>	<i>08/08 0943</i>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
94.	502229	<i>07/29 0800</i>	<i>08/08 0944</i>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
95.	502230	<i>07/29 0805</i>	<i>08/08 0944</i>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
96.	502231								<i>Trip Blank</i>
97.	502232	<i>07/29 0810</i>	<i>08/08 0945</i>			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
98.	502233	<i>07/29 0815</i>	<i>08/08 0946</i>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
99.	502234	<i>07/29 0820</i>	<i>08/08 0948</i>			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
100.	502235	<i>07/29 0825</i>	<i>08/08 0949</i>						
101.	502236								<i>Trip Blank</i>
102.	502237								<i>Destroyed</i>
103.	502238								<i>if</i>
104.	502239								<i>if</i>
105.	502240								<i>if</i>
106.									
107.									
108.									
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GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

DATE ANALYZED	SAMPLE NAME	TPH, ug	BTEX, ug	BENZ, ug	TOL, ug	EtBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug
	MDL=			0.01	0.01	0.01	0.01	0.01		0.01
08/16/06	502136	4.17	0.44	0.07	0.29	nd	0.05	0.03	0.05	nd
08/16/06	502137	2.71	0.11	0.09	0.02	nd	nd	nd	0.01	0.01
08/16/06	502138	1.50	nd	nd	nd	nd	nd	nd	nd	nd
08/16/06	502139	17.25	0.96	0.24	0.36	0.06	0.18	0.12	0.09	0.04
08/15/06	502140	70.16	0.25	0.13	0.04	0.02	0.03	0.03	0.06	0.03
08/15/06	502141	4.17	0.35	0.15	0.02	0.03	0.10	0.05	0.04	0.03
08/16/06	502142	0.22	nd	nd	nd	nd	nd	nd	0.01	0.01
08/15/06	502143	0.46	0.01	nd	nd	nd	0.01	nd	0.01	0.01
08/16/06	502144	2.25	0.07	0.06	nd	nd	nd	0.01	0.13	0.13
08/17/06	502145	40.51	0.18	0.14	0.02	nd	nd	0.02	0.12	0.12
08/17/06	502146	0.19	0.07	nd	nd	nd	0.05	0.02	nd	nd
08/16/06	502147	4.64	0.02	nd	nd	0.01	0.01	nd	0.04	0.04
08/14/06	502148	80.03	nd	nd	nd	nd	nd	nd	nd	nd
08/16/06	502149	0.71	0.04	0.04	nd	nd	nd	nd	nd	nd
08/17/06	502150	0.16	nd	nd	nd	nd	nd	nd	nd	nd
08/16/06	502151	8.73	0.05	0.05	nd	nd	nd	nd	nd	nd
08/16/06	502152	37.86	0.10	0.02	nd	0.01	0.04	0.03	nd	nd
08/15/06	502153	0.74	nd	nd	nd	nd	nd	nd	nd	nd
08/16/06	502154	0.16	nd	nd	nd	nd	nd	nd	0.01	0.01
08/15/06	502155	11.83	nd	nd	nd	nd	nd	nd	nd	nd
08/16/06	502156	1.81	0.04	0.04	nd	nd	nd	nd	0.12	0.03
08/16/06	502157	2.47	0.03	0.03	nd	nd	nd	nd	0.01	nd
08/15/06	502158	53.57	0.17	0.12	nd	0.01	0.02	0.02	0.14	0.14
08/17/06	502159	25.81	0.09	0.04	0.03	0.02	nd	nd	nd	nd
08/15/06	502160	0.04	nd	nd	nd	nd	nd	nd	nd	nd
08/15/06	502161	19.95	0.05	0.05	nd	nd	nd	nd	0.08	0.02
08/16/06	502162	294.83	0.42	0.32	0.03	0.01	0.03	0.03	1.63	1.12
08/15/06	502163	86.35	0.42	0.30	0.04	0.03	0.03	0.02	0.58	0.58
08/15/06	502164	351.61	0.11	0.08	0.03	nd	nd	nd	1.66	1.66
08/16/06	502165	6.09	0.02	0.02	nd	nd	nd	nd	0.01	nd
08/17/06	502166	3.09	nd	nd	nd	nd	nd	nd	0.02	0.02

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

DATE ANALYZED	SAMPLE NAME	TPH, ug	BTEX, ug	BENZ, ug	TOL, ug	EtBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug
	MDL=			0.01	0.01	0.01	0.01	0.01		0.01
08/15/06	502167	35.53	0.07	0.07	nd	nd	nd	nd	0.01	nd
08/17/06	502168	121.15	0.09	0.06	nd	nd	0.01	0.02	0.24	0.15
08/15/06	502169	78.52	0.06	0.06	nd	nd	nd	nd	0.55	0.41
08/16/06	502170	37.35	0.32	0.20	0.06	0.02	0.01	0.03	0.07	0.07
08/15/06	502171	31.63	0.31	0.14	0.08	0.04	0.03	0.02	0.09	0.09
08/16/06	502172	2.39	nd	nd	nd	nd	nd	nd	0.05	0.02
08/17/06	502173	2.45	0.04	0.04	nd	nd	nd	nd	0.01	0.01
08/15/06	502174	1.51	nd	nd	nd	nd	nd	nd	0.02	0.01
08/16/06	502175	0.28	nd	nd	nd	nd	nd	nd	nd	nd
08/15/06	502176	18.11	0.11	0.08	0.02	nd	0.01	nd	0.04	0.03
08/16/06	502177	54.83	0.04	nd	0.03	nd	nd	0.01	0.84	0.21
08/16/06	502179	24.77	0.04	nd	0.04	nd	nd	nd	0.07	0.03
08/15/06	502180	6.83	nd	nd	nd	nd	nd	nd	nd	nd
08/14/06	502181	150.27	0.21	nd	0.06	0.07	0.08	nd	0.32	nd
08/15/06	502182	25.46	nd	nd	nd	nd	nd	nd	0.14	0.01
08/17/06	502184	3.51	nd	nd	nd	nd	nd	nd	nd	nd
08/17/06	502185	4.43	nd	nd	nd	nd	nd	nd	nd	nd
08/17/06	502186	386.43	0.02	nd	nd	nd	nd	0.02	2.83	0.51
08/15/06	502187	13.47	nd	nd	nd	nd	nd	nd	0.04	0.02
08/16/06	502188	2.65	nd	nd	nd	nd	nd	nd	nd	nd
08/16/06	502189	0.87	nd	nd	nd	nd	nd	nd	nd	nd
08/16/06	502190	3.25	nd	nd	nd	nd	nd	nd	0.01	0.01
08/17/06	502191	0.75	0.03	0.03	nd	nd	nd	nd	nd	nd
08/15/06	502192	3.22	nd	nd	nd	nd	nd	nd	0.03	0.02
08/15/06	502193	10.32	0.04	0.04	nd	nd	nd	nd	0.03	0.02
08/15/06	502194	161.74	0.15	0.13	0.02	nd	nd	nd	0.46	0.38
08/16/06	502195	1.59	nd	nd	nd	nd	nd	nd	0.02	0.01
08/17/06	502196	7.82	0.04	0.04	nd	nd	nd	nd	0.01	nd
08/14/06	502197	0.76	nd	nd	nd	nd	nd	nd	nd	nd
08/15/06	502198	4.99	nd	nd	nd	nd	nd	nd	0.01	0.01
08/14/06	502199	45.43	0.10	0.07	nd	0.03	nd	nd	0.07	0.04

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

DATE ANALYZED	SAMPLE NAME	TPH, ug	BTEX, ug	BENZ, ug	TOL, ug	EtBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug
	MDL=			0.01	0.01	0.01	0.01	0.01		0.01
08/16/06	502200	1.01	nd	nd	nd	nd	nd	nd	0.03	0.01
08/15/06	502201	23.73	0.21	nd	0.21	nd	nd	nd	0.02	nd
08/15/06	502202	86.33	0.19	0.07	0.04	0.08	nd	nd	0.12	0.04
08/16/06	502203	61.83	0.23	0.05	0.04	0.14	nd	nd	0.06	0.04
08/14/06	502204	1.10	nd	nd	nd	nd	nd	nd	0.01	nd
08/16/06	502205	47.55	0.25	0.04	0.12	0.08	0.01	nd	0.06	0.05
08/15/06	502206	5.36	nd	nd	nd	nd	nd	nd	0.14	0.02
08/16/06	502207	10.03	0.12	nd	0.02	0.08	0.01	0.01	0.05	0.04
08/15/06	502208	43.97	0.12	0.03	nd	0.09	nd	nd	1.69	0.63
08/15/06	502209	17.06	0.04	0.04	nd	nd	nd	nd	0.03	0.01
08/14/06	502210	34.05	0.26	nd	nd	0.21	0.03	0.02	0.06	0.04
08/14/06	502211	37.05	0.05	nd	nd	0.05	nd	nd	0.17	0.13
08/14/06	502212	9.55	0.02	nd	nd	0.02	nd	nd	0.10	nd
08/16/06	502213	87.67	0.03	nd	0.01	nd	nd	0.02	0.01	0.01
08/14/06	502214	3.40	nd	nd	nd	nd	nd	nd	0.01	0.01
08/16/06	502215	15.72	0.08	0.05	nd	0.03	nd	nd	0.28	0.03
08/15/06	502216	17.56	0.06	0.03	nd	0.01	0.01	0.01	0.02	0.02
08/15/06	502217	7.64	nd	nd	nd	nd	nd	nd	0.07	0.05
08/16/06	502218	24.40	0.04	nd	nd	0.04	nd	nd	0.04	0.01
08/14/06	502219	10.31	nd	nd	nd	nd	nd	nd	0.12	0.02
08/14/06	502220	0.17	nd	nd	nd	nd	nd	nd	0.03	0.03
08/14/06	502221	5.06	nd	nd	nd	nd	nd	nd	0.05	0.03
08/15/06	502222	7.12	nd	nd	nd	nd	nd	nd	0.15	0.05
08/15/06	502223	2.82	nd	nd	nd	nd	nd	nd	0.01	nd
08/15/06	502224	6.10	0.05	0.05	nd	nd	nd	nd	0.01	0.01
08/15/06	502225	1.18	nd	nd	nd	nd	nd	nd	nd	nd
08/15/06	502226	0.84	nd	nd	nd	nd	nd	nd	0.04	0.01
08/14/06	502227	1.15	nd	nd	nd	nd	nd	nd	0.01	nd
08/16/06	502228	12.20	0.02	0.02	nd	nd	nd	nd	0.12	0.02
08/15/06	502229	48.28	0.14	0.09	0.03	0.02	nd	nd	0.72	0.59
08/16/06	502230	21.16	0.11	0.06	nd	0.03	0.01	0.01	0.03	0.03

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

DATE ANALYZED	SAMPLE NAME	TPH, ug	BTEX, ug	BENZ, ug	TOL, ug	EtBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug
	MDL=			0.01	0.01	0.01	0.01	0.01		0.01
08/16/06	502232	3.28	0.02	nd	nd	0.02	nd	nd	0.02	0.02
08/16/06	502234	0.96	nd	nd	nd	nd	nd	nd	nd	nd
08/16/06	502235	65.98	0.71	nd	0.71	nd	nd	nd	0.02	0.01
08/15/06	502183	0.04	nd	nd	nd	nd	nd	nd	nd	nd
08/16/06	502231	0.02	nd	nd	nd	nd	nd	nd	nd	nd
08/17/06	502236	0.01	nd	nd	nd	nd	nd	nd	nd	nd
08/14/06	method blank	0.00	nd	nd	nd	nd	nd	nd	nd	nd
08/15/06	method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd
08/16/06	method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd
08/17/06	method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd
	Maximum	386.43	0.96	0.32	0.71	0.21	0.18	0.12	2.83	1.66
	Standard Dev.	65.07	0.15	0.06	0.09	0.03	0.02	0.02	0.42	0.23
	Mean	32.27	0.09	0.04	0.02	0.01	0.01	0.01	0.16	0.08

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

SAMPLE NAME	TRIDEC, ug	PENTADEC, ug	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug
MDL=	0.01	0.01		0.01	0.01		0.02	0.02	
502136	0.04	0.01	0.66	0.46	0.20	nd	nd	nd	0.25
502137	nd	nd	0.04	0.03	0.01	nd	nd	nd	0.03
502138	nd	nd	nd	nd	nd	nd	nd	nd	nd
502139	0.03	0.02	0.87	0.55	0.32	nd	nd	nd	0.21
502140	0.01	0.02	0.20	0.11	0.09	0.06	nd	0.06	0.09
502141	nd	0.01	0.98	0.72	0.26	nd	nd	nd	0.55
502142	nd	nd	nd	nd	nd	nd	nd	nd	nd
502143	nd	nd	0.04	0.02	0.02	nd	nd	nd	nd
502144	nd	nd	0.01	0.01	nd	nd	nd	nd	0.02
502145	nd	nd	0.16	0.14	0.02	0.04	nd	0.04	0.38
502146	nd	nd	0.20	0.14	0.06	0.05	nd	0.05	0.04
502147	nd	nd	0.05	0.03	0.02	nd	nd	nd	0.03
502148	nd	nd	0.01	0.01	nd	nd	nd	nd	0.01
502149	nd	nd	nd	nd	nd	nd	nd	nd	nd
502150	nd	nd	nd	nd	nd	nd	nd	nd	nd
502151	nd	nd	0.03	0.02	0.01	0.02	nd	0.02	nd
502152	nd	nd	0.73	0.56	0.17	0.00	nd	bdl	0.20
502153	nd	nd	0.01	0.01	nd	nd	nd	nd	0.11
502154	nd	nd	nd	nd	nd	1.75	0.05	1.70	nd
502155	nd	nd	nd	nd	nd	nd	nd	nd	nd
502156	0.08	0.01	nd	nd	nd	7.13	0.39	6.74	nd
502157	nd	0.01	nd	nd	nd	0.11	nd	0.11	0.16
502158	nd	nd	0.04	0.03	0.01	nd	nd	nd	0.29
502159	nd	nd	nd	nd	nd	nd	nd	nd	nd
502160	nd	nd	nd	nd	nd	nd	nd	nd	nd
502161	0.06	nd	0.01	0.01	nd	2.56	0.17	2.39	0.04
502162	0.51	nd	0.21	0.17	0.04	8.78	2.99	5.79	0.09
502163	nd	nd	0.83	0.29	0.54	0.58	0.04	0.54	0.06
502164	nd	nd	0.03	0.02	0.01	0.02	nd	0.02	0.01
502165	nd	0.01	nd	nd	nd	nd	nd	nd	nd
502166	nd	nd	0.01	0.01	nd	0.13	0.02	0.11	0.01

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

SAMPLE NAME	TRIDEC, ug	PENTADEC, ug	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug
MDL=	0.01	0.01		0.01	0.01		0.02	0.02	
502167	0.01	nd	0.01	0.01	nd	1.49	0.05	1.44	nd
502168	nd	0.09	0.06	0.04	0.02	0.94	0.23	0.71	0.04
502169	0.13	0.01	0.06	0.04	0.02	nd	nd	nd	0.03
502170	nd	nd	0.11	0.08	0.03	0.00	nd	bdl	0.07
502171	nd	nd	0.14	0.08	0.06	nd	nd	nd	0.07
502172	0.02	0.01	nd	nd	nd	0.10	nd	0.10	nd
502173	nd	nd	0.01	0.01	nd	0.72	0.03	0.69	nd
502174	nd	0.01	nd	nd	nd	nd	nd	nd	nd
502175	nd	nd	nd	nd	nd	nd	nd	nd	nd
502176	nd	0.01	0.02	0.02	nd	0.00	nd	bdl	nd
502177	0.49	0.14	0.22	0.10	0.12	nd	nd	nd	0.10
502179	0.03	0.01	0.05	0.02	0.03	0.11	nd	0.11	0.09
502180	nd	nd	nd	nd	nd	nd	nd	nd	nd
502181	0.19	0.13	0.05	0.01	0.04	nd	nd	nd	0.05
502182	0.11	0.02	nd	nd	nd	nd	nd	nd	0.02
502184	nd	nd	nd	nd	nd	nd	nd	nd	nd
502185	nd	nd	nd	nd	nd	nd	nd	nd	nd
502186	2.32	nd	0.44	0.12	0.32	nd	nd	nd	0.79
502187	0.01	0.01	nd	nd	nd	nd	nd	nd	nd
502188	nd	nd	nd	nd	nd	nd	nd	nd	nd
502189	nd	nd	nd	nd	nd	nd	nd	nd	nd
502190	nd	nd	nd	nd	nd	nd	nd	nd	nd
502191	nd	nd	nd	nd	nd	0.17	nd	0.17	nd
502192	0.01	nd	nd	nd	nd	0.18	0.04	0.14	0.02
502193	nd	0.01	0.03	0.02	0.01	0.10	bdl	0.10	0.17
502194	nd	0.08	0.02	0.01	0.01	13.81	1.81	12.00	0.01
502195	nd	0.01	nd	nd	nd	nd	nd	nd	nd
502196	nd	0.01	0.04	0.03	0.01	nd	nd	nd	nd
502197	nd	nd	0.01	0.01	nd	nd	nd	nd	nd
502198	nd	nd	0.01	0.01	nd	nd	nd	nd	0.38
502199	0.03	nd	0.02	0.01	0.01	0.02	nd	0.02	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

SAMPLE NAME	TRIDEC, ug	PENTADEC, ug	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug
MDL=	0.01	0.01		0.01	0.01		0.02	0.02	
502200	0.01	0.01	nd	nd	nd	nd	nd	nd	nd
502201	nd	0.02	nd	nd	nd	nd	nd	nd	nd
502202	0.06	0.02	0.08	0.02	0.06	nd	nd	nd	0.07
502203	0.02	nd	0.03	0.02	0.01	nd	nd	nd	nd
502204	0.01	nd	nd	nd	nd	nd	nd	nd	nd
502205	0.01	nd	0.02	0.01	0.01	nd	nd	nd	0.00
502206	0.11	0.01	nd	nd	nd	nd	nd	nd	nd
502207	nd	0.01	0.17	0.12	0.05	nd	nd	nd	0.03
502208	0.85	0.21	0.05	0.03	0.02	nd	nd	nd	0.04
502209	0.01	0.01	0.02	0.01	0.01	nd	nd	nd	nd
502210	0.01	0.01	0.20	0.11	0.09	nd	nd	nd	0.03
502211	0.03	0.01	0.04	0.02	0.02	nd	nd	nd	0.00
502212	0.08	0.02	0.02	0.01	0.01	nd	nd	nd	nd
502213	nd	nd	0.06	0.03	0.03	nd	nd	nd	nd
502214	nd	nd	0.01	0.01	nd	nd	nd	nd	0.07
502215	0.22	0.03	0.03	0.02	0.01	nd	nd	nd	0.04
502216	nd	nd	0.03	0.02	0.01	nd	nd	nd	0.06
502217	0.02	nd	0.05	0.03	0.02	nd	nd	nd	0.03
502218	0.01	0.02	0.02	0.01	0.01	nd	nd	nd	nd
502219	0.06	0.04	0.02	0.01	0.01	nd	nd	nd	nd
502220	nd	nd	nd	nd	nd	nd	nd	nd	nd
502221	0.01	0.01	0.01	0.01	nd	nd	nd	nd	nd
502222	0.07	0.03	0.03	0.02	0.01	nd	nd	nd	0.10
502223	nd	0.01	0.03	0.02	0.01	nd	nd	nd	0.04
502224	nd	nd	0.05	0.03	0.02	nd	nd	nd	0.05
502225	nd	nd	nd	nd	nd	nd	nd	nd	0.01
502226	0.02	0.01	nd	nd	nd	nd	nd	nd	nd
502227	nd	0.01	0.01	0.01	nd	nd	nd	nd	nd
502228	0.10	nd	0.02	0.01	0.01	nd	nd	nd	0.04
502229	0.13	nd	0.12	0.07	0.05	nd	nd	nd	0.26
502230	nd	nd	0.08	0.05	0.03	nd	nd	nd	0.08

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

SAMPLE NAME	TRIDEC, ug	PENTADEC, ug	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug
MDL=	0.01	0.01		0.01	0.01		0.02	0.02	
502232	nd	nd	0.02	0.01	0.01	nd	nd	nd	nd
502234	nd	nd	nd	nd	nd	nd	nd	nd	nd
502235	nd	0.01	0.02	0.01	0.01	nd	nd	nd	nd
502183	nd	nd	nd	nd	nd	nd	nd	nd	nd
502231	nd	nd	nd	nd	nd	nd	nd	nd	nd
502236	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd
Maximum	2.32	0.21	0.98	0.72	0.54	13.81	2.99	12.00	0.79
Standard Dev.	0.26	0.03	0.19	0.12	0.08	1.83	0.36	1.53	0.12
Mean	0.06	0.01	0.08	0.05	0.03	0.40	0.06	0.34	0.06

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

SAMPLE NAME	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCE, ug	11DCA, ug	111TCA, ug	12DCA, ug	TCE, ug	OCT, ug	PCE, ug	14DCB, ug
MDL=	0.02	0.01	0.02	0.02	0.05	0.02	0.01	0.01	0.01	0.02	0.01
502136	0.15	0.10	nd	nd	nd	nd	nd	nd	nd	nd	nd
502137	0.02	0.01	nd	nd	nd	nd	nd	nd	nd	nd	nd
502138	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502139	0.14	0.07	nd	nd	nd	nd	nd	nd	0.01	nd	nd
502140	0.07	0.02	nd	nd	nd	nd	nd	nd	0.01	nd	nd
502141	0.36	0.19	nd	nd	nd	nd	nd	nd	0.02	nd	nd
502142	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502143	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502144	0.02	nd	nd	nd	nd	nd	nd	0.04	nd	nd	nd
502145	0.19	0.19	nd	nd	nd	nd	nd	0.08	0.03	nd	nd
502146	0.03	0.01	nd	nd	nd	nd	nd	nd	nd	nd	nd
502147	0.02	0.01	nd	nd	nd	nd	nd	nd	nd	nd	nd
502148	nd	0.01	nd	nd	nd	nd	nd	nd	nd	nd	nd
502149	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502150	nd	nd	nd	nd	nd	nd	nd	0.01	nd	nd	nd
502151	nd	nd	nd	nd	nd	nd	nd	0.02	nd	nd	nd
502152	0.15	0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd
502153	0.05	0.06	nd	nd	nd	nd	nd	nd	nd	nd	nd
502154	nd	nd	nd	nd	nd	nd	nd	0.26	nd	nd	nd
502155	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502156	nd	nd	nd	nd	nd	nd	nd	2.13	nd	nd	nd
502157	0.09	0.07	nd	nd	nd	nd	nd	0.48	nd	nd	0.05
502158	0.21	0.08	nd	nd	nd	nd	nd	0.01	0.03	nd	0.05
502159	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502160	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502161	0.03	0.01	nd	nd	nd	nd	0.03	0.60	nd	nd	nd
502162	0.07	0.02	nd	0.14	nd	nd	nd	0.71	0.02	nd	0.02
502163	0.05	0.01	nd	nd	nd	nd	nd	0.20	0.03	nd	0.01
502164	nd	0.01	nd	nd	nd	nd	nd	nd	0.03	nd	nd
502165	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502166	nd	0.01	nd	nd	nd	nd	nd	0.08	nd	nd	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

SAMPLE NAME	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCE, ug	11DCA, ug	111TCA, ug	12DCA, ug	TCE, ug	OCT, ug	PCE, ug	14DCB, ug
MDL=	0.02	0.01	0.02	0.02	0.05	0.02	0.01	0.01	0.01	0.02	0.01
502167	nd	nd	nd	nd	nd	nd	nd	0.38	nd	nd	nd
502168	0.03	0.01	nd	nd	nd	nd	nd	0.28	nd	nd	nd
502169	0.02	0.01	nd	nd	nd	nd	nd	nd	nd	nd	0.13
502170	0.05	0.02	nd	nd	nd	nd	nd	nd	nd	nd	nd
502171	0.05	0.02	nd	nd	nd	nd	nd	nd	0.02	nd	nd
502172	nd	nd	nd	nd	nd	nd	nd	0.11	nd	nd	nd
502173	nd	nd	nd	nd	nd	nd	nd	0.48	nd	nd	nd
502174	nd	nd	nd	nd	nd	nd	nd	0.37	nd	nd	nd
502175	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502176	nd	nd	nd	nd	nd	nd	nd	nd	0.01	nd	nd
502177	0.06	0.04	nd	nd	nd	nd	nd	nd	nd	nd	nd
502179	0.09	nd	nd	nd	nd	nd	nd	0.04	nd	nd	nd
502180	nd	nd	nd	nd	nd	nd	nd	0.01	nd	0.09	nd
502181	0.03	0.02	nd	nd	nd	nd	nd	nd	nd	nd	nd
502182	0.02	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502184	nd	nd	nd	nd	nd	nd	nd	0.04	nd	0.12	nd
502185	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502186	0.66	0.13	nd	nd	nd	nd	nd	nd	nd	nd	nd
502187	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502188	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502189	nd	nd	nd	nd	nd	nd	nd	0.12	nd	0.40	nd
502190	nd	nd	nd	nd	nd	nd	nd	nd	0.01	nd	nd
502191	nd	nd	nd	nd	nd	nd	nd	0.48	nd	0.03	nd
502192	0.02	nd	nd	nd	nd	nd	nd	0.10	nd	nd	nd
502193	0.14	0.03	nd	nd	nd	nd	nd	0.27	nd	0.15	nd
502194	bdl	0.01	nd	0.04	nd	nd	nd	7.37	nd	7.92	nd
502195	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502196	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502197	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502198	0.21	0.17	nd	nd	nd	nd	nd	nd	nd	nd	nd
502199	nd	nd	nd	nd	nd	nd	nd	0.01	nd	nd	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

SAMPLE NAME	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCE, ug	11DCA, ug	111TCA, ug	12DCA, ug	TCE, ug	OCT, ug	PCE, ug	14DCB, ug
MDL=	0.02	0.01	0.02	0.02	0.05	0.02	0.01	0.01	0.01	0.02	0.01
502200	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502201	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502202	0.06	0.01	nd	nd	nd	nd	nd	nd	0.02	nd	nd
502203	nd	nd	nd	nd	nd	nd	nd	nd	0.01	nd	nd
502204	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502205	bdl	nd	nd	nd	nd	nd	nd	nd	0.01	nd	nd
502206	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502207	0.02	0.01	nd	nd	nd	nd	nd	nd	nd	nd	nd
502208	0.02	0.02	nd	nd	nd	nd	nd	nd	nd	nd	nd
502209	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502210	0.02	0.01	nd	nd	nd	nd	nd	nd	0.07	nd	nd
502211	bdl	nd	nd	nd	nd	nd	nd	nd	0.02	nd	nd
502212	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502213	nd	nd	nd	nd	nd	nd	nd	nd	0.04	nd	nd
502214	0.06	0.01	nd	nd	nd	nd	nd	nd	nd	nd	nd
502215	0.03	0.01	nd	nd	nd	nd	nd	nd	nd	nd	nd
502216	0.05	0.01	nd	nd	nd	nd	nd	0.08	nd	nd	nd
502217	0.02	0.01	nd	nd	nd	nd	nd	nd	nd	nd	nd
502218	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502219	nd	nd	nd	nd	nd	nd	nd	0.01	nd	nd	nd
502220	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502221	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502222	0.05	0.05	nd	nd	nd	nd	nd	nd	nd	nd	nd
502223	0.04	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502224	0.04	0.01	nd	nd	nd	nd	nd	nd	nd	nd	nd
502225	nd	0.01	nd	nd	nd	nd	nd	nd	nd	nd	nd
502226	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502227	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502228	0.02	0.02	nd	nd	nd	nd	nd	nd	nd	nd	nd
502229	0.12	0.14	nd	nd	nd	nd	nd	nd	nd	nd	nd
502230	0.06	0.02	nd	nd	nd	nd	nd	nd	nd	nd	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

SAMPLE NAME	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCE, ug	11DCA, ug	111TCA, ug	12DCA, ug	TCE, ug	OCT, ug	PCE, ug	14DCB, ug
MDL=	0.02	0.01	0.02	0.02	0.05	0.02	0.01	0.01	0.01	0.02	0.01
502232	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502234	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502235	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502183	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502231	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502236	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Maximum	0.66	0.19	0.00	0.14	0.00	0.00	0.03	7.37	0.07	7.92	0.13
Standard Dev.	0.09	0.04	0.00	0.01	0.00	0.00	0.00	0.79	0.01	0.81	0.02
Mean	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.09	0.00

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

SAMPLE NAME	CHCl3, ug	CCl4, ug	112TCA, ug	CIBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
MDL=	0.05	0.05	0.05	0.01	0.01	0.05	0.01	0.05
502136	nd	nd	nd	nd	nd	nd	nd	nd
502137	nd	nd	nd	nd	nd	nd	nd	nd
502138	nd	nd	nd	nd	nd	nd	nd	nd
502139	nd	nd	nd	nd	nd	nd	nd	nd
502140	nd	nd	nd	nd	nd	bdl	nd	nd
502141	nd	nd	nd	nd	nd	nd	nd	nd
502142	nd	nd	nd	nd	nd	nd	nd	nd
502143	nd	nd	nd	nd	nd	nd	nd	nd
502144	nd	nd	nd	nd	nd	nd	nd	nd
502145	nd	nd	nd	nd	nd	0.10	nd	nd
502146	nd	nd	nd	nd	nd	nd	nd	nd
502147	bdl	nd	nd	nd	nd	nd	nd	nd
502148	nd	nd	nd	nd	nd	nd	nd	nd
502149	1.53	nd	nd	nd	nd	nd	nd	nd
502150	bdl	nd	nd	nd	nd	nd	nd	nd
502151	0.08	nd	nd	nd	nd	nd	nd	nd
502152	nd	nd	nd	nd	nd	nd	nd	nd
502153	nd	nd	nd	nd	nd	nd	nd	nd
502154	nd	nd	nd	nd	nd	nd	nd	nd
502155	bdl	nd	nd	nd	nd	nd	nd	nd
502156	0.43	nd	nd	nd	nd	nd	nd	nd
502157	0.23	nd	nd	nd	nd	nd	nd	nd
502158	nd	nd	nd	nd	nd	0.10	nd	nd
502159	0.40	nd	nd	nd	nd	nd	nd	nd
502160	nd	nd	nd	nd	nd	nd	nd	nd
502161	nd	nd	nd	nd	nd	nd	nd	nd
502162	nd	nd	nd	0.08	nd	0.19	0.01	0.72
502163	nd	nd	nd	nd	nd	0.10	nd	nd
502164	nd	nd	nd	nd	nd	0.26	nd	nd
502165	0.19	nd	nd	nd	nd	nd	nd	nd
502166	nd	nd	nd	nd	nd	nd	nd	bdl

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

SAMPLE NAME	CHCl3, ug	CCl4, ug	112TCA, ug	CIBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
MDL=	0.05	0.05	0.05	0.01	0.01	0.05	0.01	0.05
502167	0.06	nd	nd	nd	nd	nd	nd	nd
502168	nd	nd	nd	nd	nd	bdl	nd	bdl
502169	nd	nd	nd	nd	nd	0.09	nd	nd
502170	0.30	nd	nd	nd	nd	0.08	nd	nd
502171	nd	nd	nd	nd	nd	nd	nd	nd
502172	nd	nd	nd	nd	nd	nd	nd	nd
502173	nd	nd	nd	nd	nd	nd	nd	bdl
502174	0.16	nd	nd	nd	nd	nd	nd	nd
502175	0.41	nd	nd	nd	nd	nd	nd	nd
502176	nd	nd	nd	nd	nd	nd	nd	nd
502177	nd	nd	nd	nd	nd	nd	nd	nd
502179	0.06	nd	nd	nd	nd	nd	nd	nd
502180	0.63	nd	nd	nd	nd	nd	nd	nd
502181	nd	nd	nd	nd	nd	nd	nd	nd
502182	nd	nd	nd	nd	nd	nd	nd	nd
502184	nd	nd	nd	nd	nd	nd	nd	nd
502185	nd	nd	nd	nd	nd	nd	nd	nd
502186	nd	nd	nd	nd	nd	0.11	nd	nd
502187	nd	nd	nd	nd	nd	nd	nd	nd
502188	nd	nd	nd	nd	nd	nd	nd	nd
502189	nd	nd	nd	nd	nd	nd	nd	nd
502190	nd	nd	nd	nd	nd	nd	nd	nd
502191	0.16	nd	nd	nd	nd	nd	nd	nd
502192	nd	nd	nd	nd	nd	0.06	nd	nd
502193	0.77	nd	nd	nd	nd	bdl	nd	nd
502194	0.10	nd	nd	nd	nd	nd	nd	nd
502195	nd	nd	nd	nd	nd	nd	nd	nd
502196	nd	nd	nd	nd	nd	nd	nd	nd
502197	nd	nd	nd	nd	nd	nd	nd	nd
502198	nd	nd	nd	nd	nd	nd	nd	nd
502199	0.06	nd	nd	nd	nd	nd	nd	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

SAMPLE NAME	CHCl3, ug	CCl4, ug	112TCA, ug	CIBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
MDL=	0.05	0.05	0.05	0.01	0.01	0.05	0.01	0.05
502200	nd	nd	nd	nd	nd	nd	nd	nd
502201	0.68	nd	nd	nd	nd	nd	nd	nd
502202	0.26	nd	nd	nd	nd	nd	nd	nd
502203	0.12	nd	nd	nd	nd	nd	nd	nd
502204	nd	nd	nd	nd	nd	nd	nd	nd
502205	bdl	nd	nd	nd	nd	bdl	nd	nd
502206	nd	nd	nd	nd	nd	nd	nd	nd
502207	nd	nd	nd	nd	nd	nd	nd	nd
502208	nd	nd	nd	nd	nd	nd	nd	nd
502209	nd	nd	nd	nd	nd	nd	nd	nd
502210	0.12	nd	nd	nd	nd	nd	nd	nd
502211	nd	nd	nd	nd	nd	nd	nd	nd
502212	nd	nd	nd	nd	nd	nd	nd	nd
502213	0.06	nd	nd	nd	nd	1.01	nd	nd
502214	nd	nd	nd	nd	nd	nd	nd	nd
502215	nd	nd	nd	nd	nd	nd	nd	nd
502216	nd	nd	nd	nd	nd	nd	nd	nd
502217	nd	nd	nd	nd	nd	nd	nd	nd
502218	nd	nd	nd	nd	nd	nd	nd	nd
502219	nd	nd	nd	nd	nd	nd	nd	nd
502220	nd	nd	nd	nd	nd	nd	nd	nd
502221	nd	nd	nd	nd	nd	nd	nd	nd
502222	0.07	nd	nd	nd	nd	nd	nd	nd
502223	nd	nd	nd	nd	nd	nd	nd	nd
502224	nd	nd	nd	nd	nd	nd	nd	nd
502225	nd	nd	nd	nd	nd	nd	nd	nd
502226	nd	nd	nd	nd	nd	nd	nd	nd
502227	nd	nd	nd	nd	nd	nd	nd	nd
502228	nd	nd	nd	nd	nd	nd	nd	nd
502229	nd	nd	nd	nd	nd	nd	nd	nd
502230	nd	nd	nd	nd	nd	nd	nd	nd

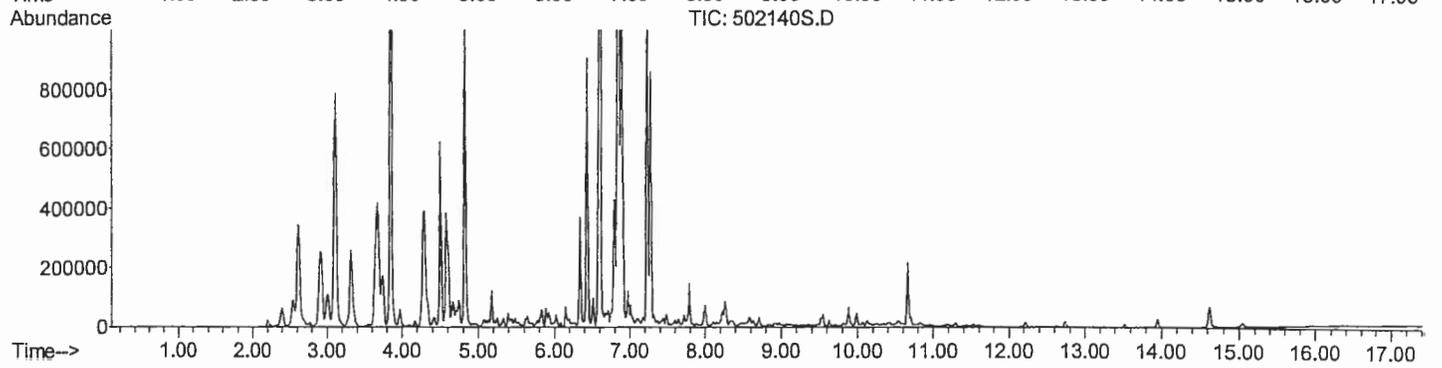
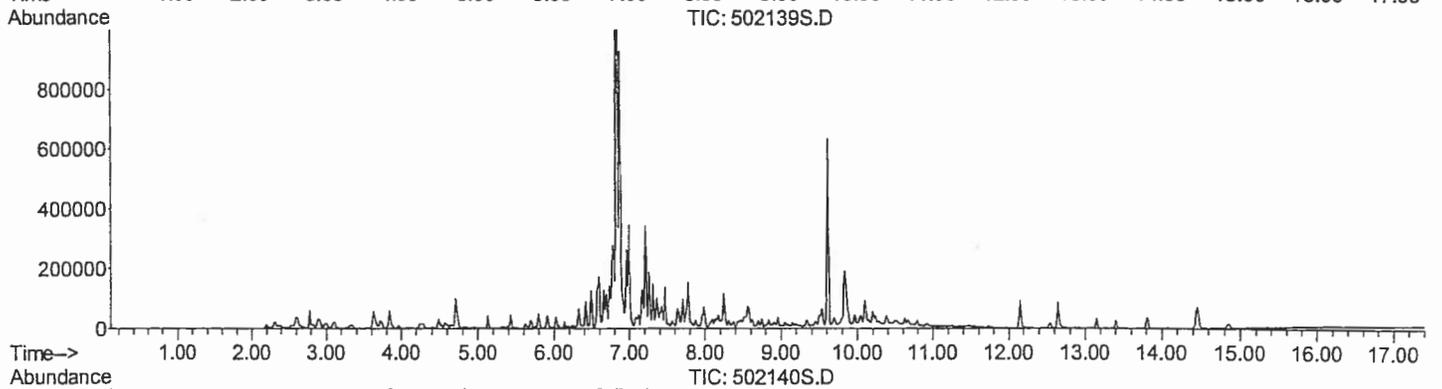
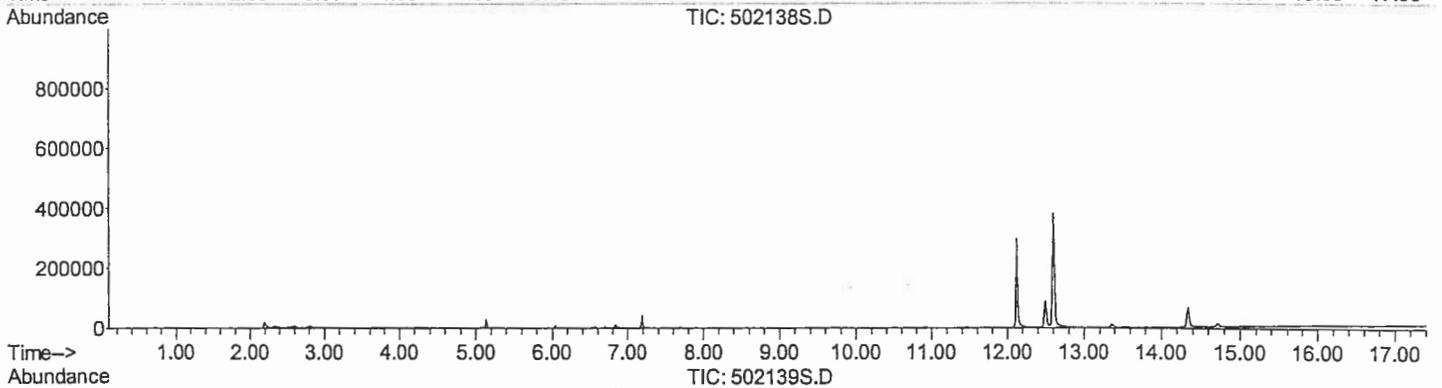
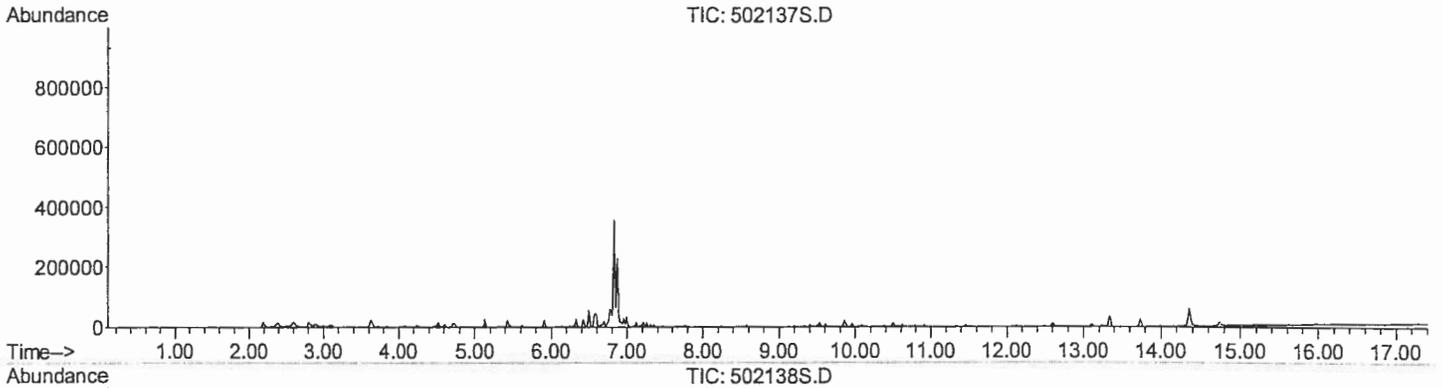
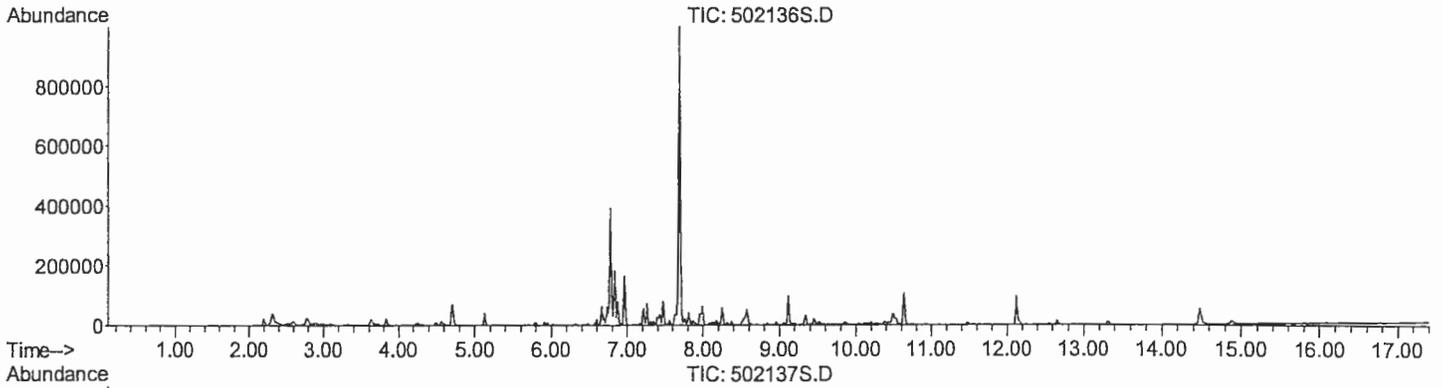
No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRATECH NUS, TALLAHASSEE, FL
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE3/NCBC, GULFPORT, MS
SITE DKG - PRODUCTION ORDER# 12792893

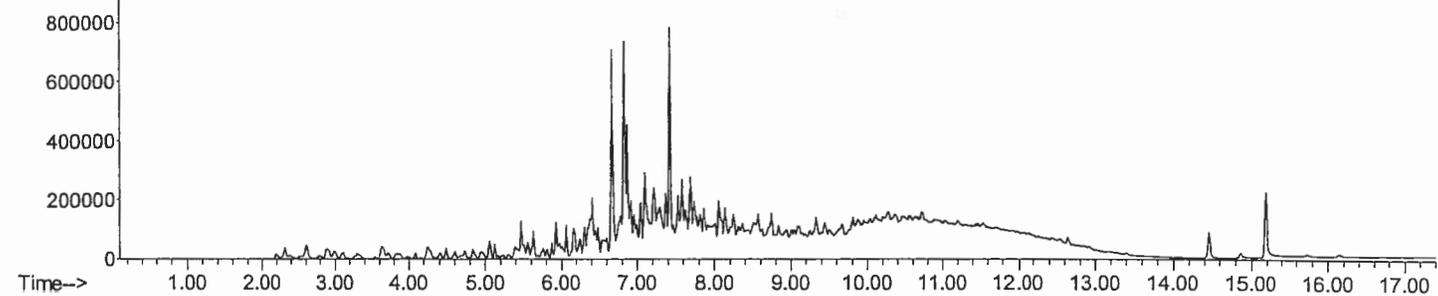
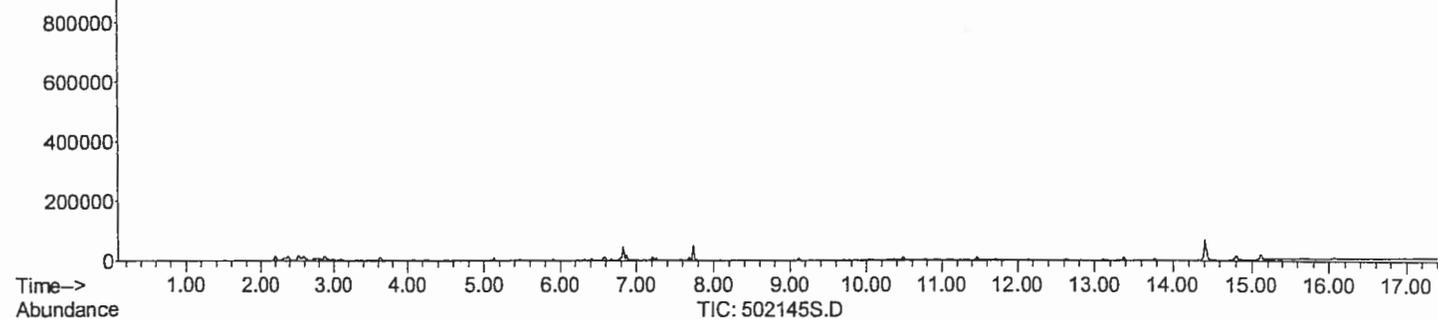
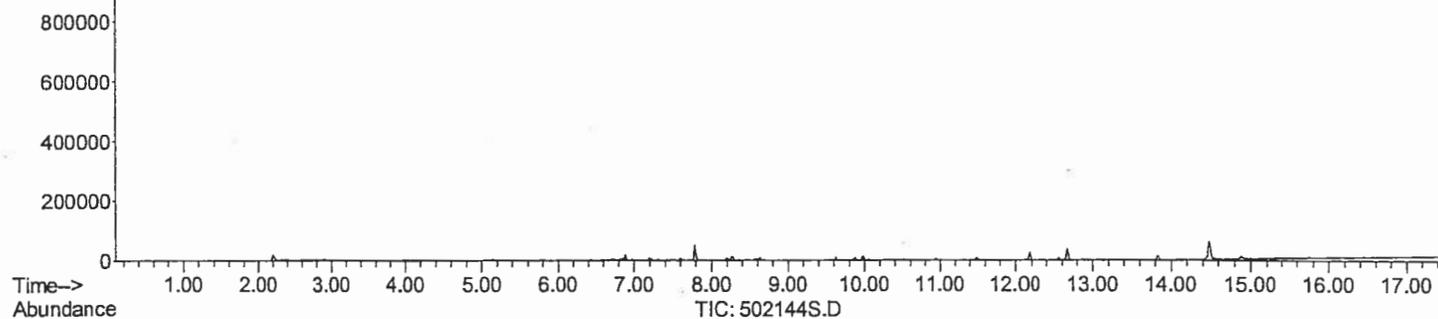
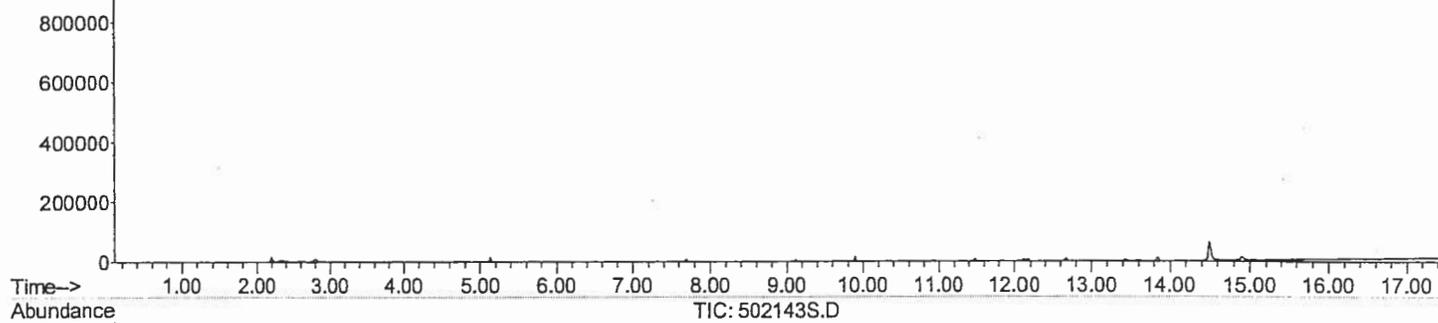
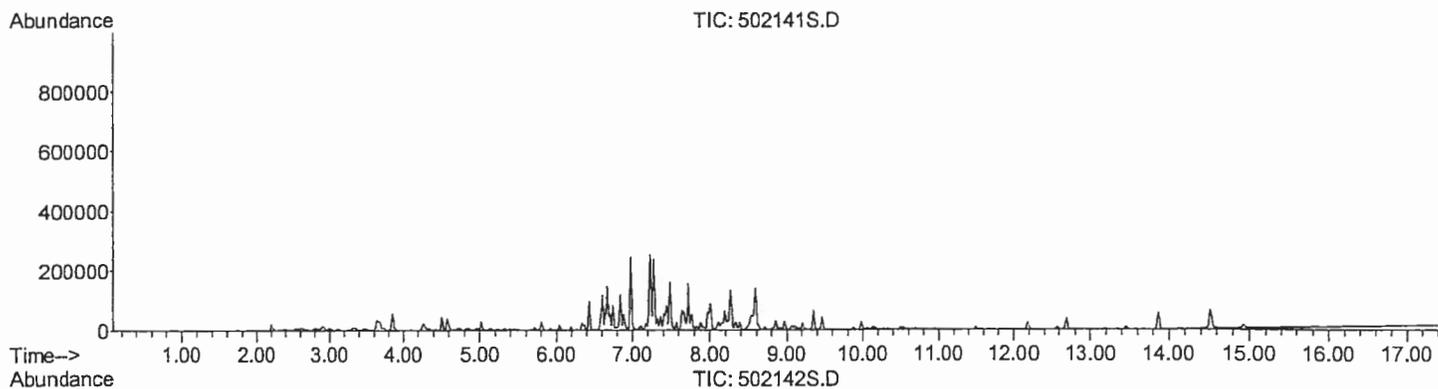
SAMPLE NAME	CHCl3, ug	CCl4, ug	112TCA, ug	CIBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
MDL=	0.05	0.05	0.05	0.01	0.01	0.05	0.01	0.05
502232	nd	nd	nd	nd	nd	nd	nd	nd
502234	nd	nd	nd	nd	nd	nd	nd	nd
502235	nd	nd	nd	nd	nd	nd	nd	nd
502183	nd	nd	nd	nd	nd	nd	nd	nd
502231	nd	nd	nd	nd	nd	nd	nd	nd
502236	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd
Maximum	1.53	0.00	0.00	0.08	0.00	1.01	0.01	0.72
Standard Dev.	0.21	0.00	0.00	0.01	0.00	0.11	0.00	0.07
Mean	0.07	0.00	0.00	0.00	0.00	0.02	0.00	0.01

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

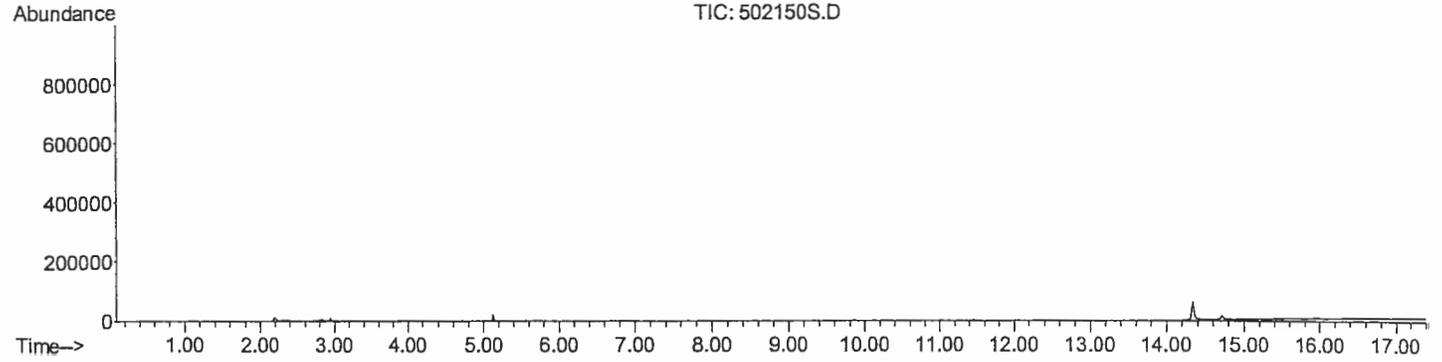
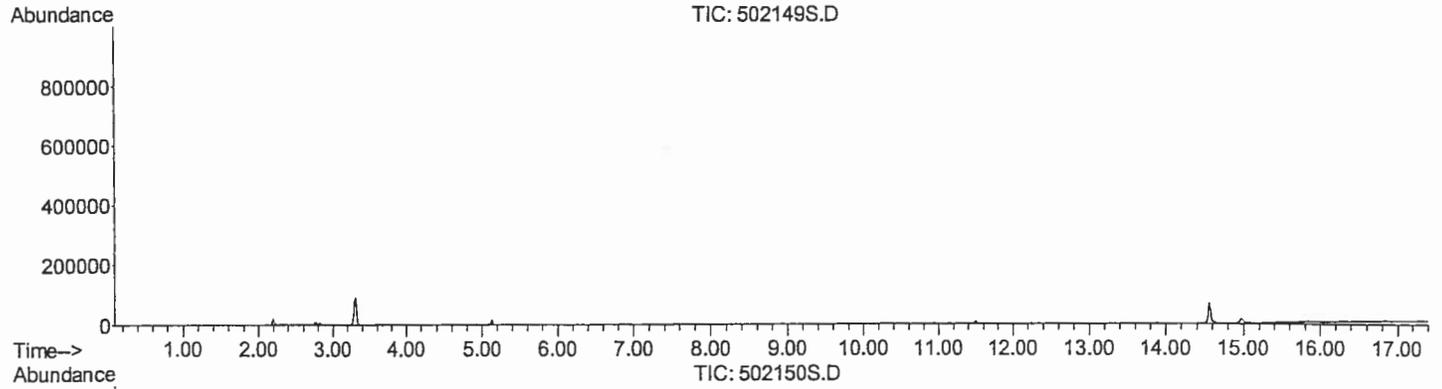
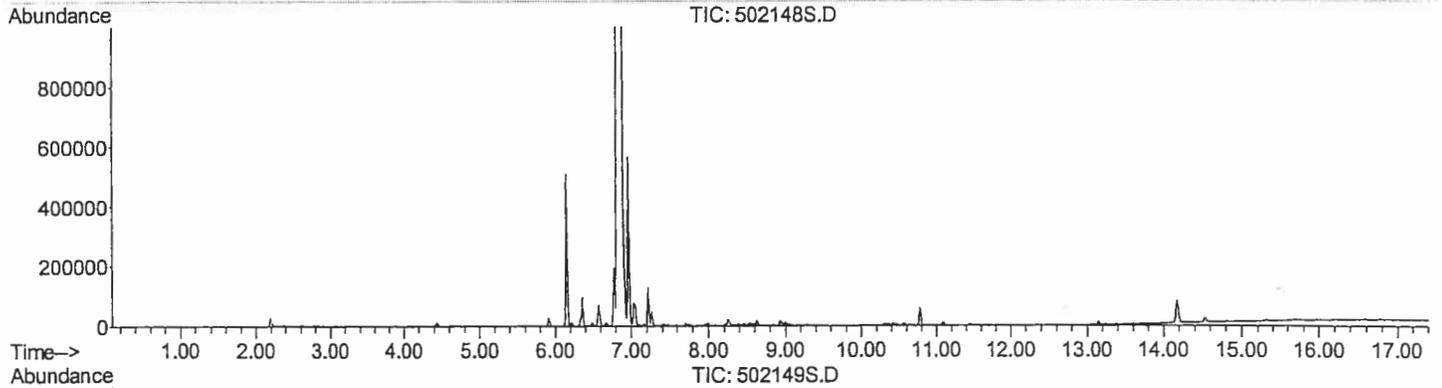
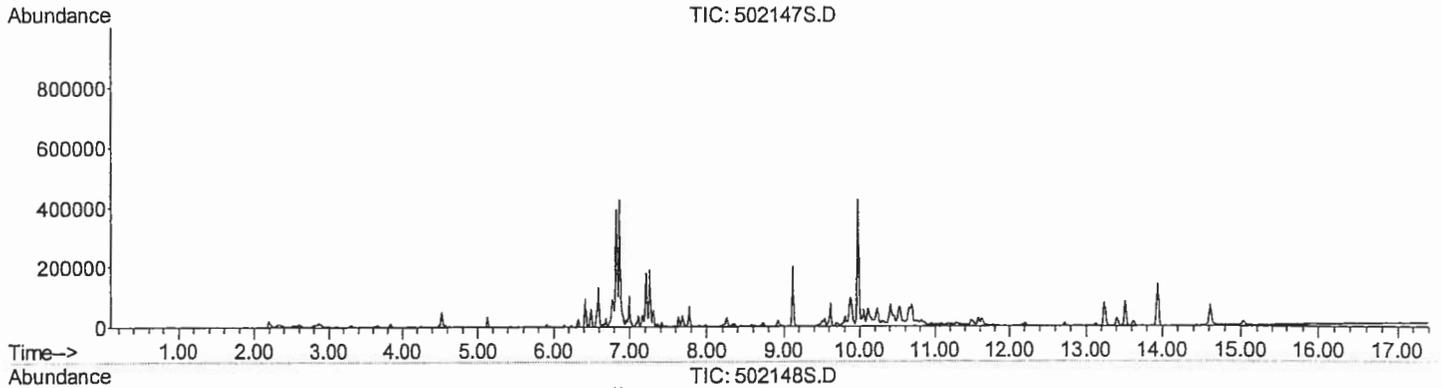
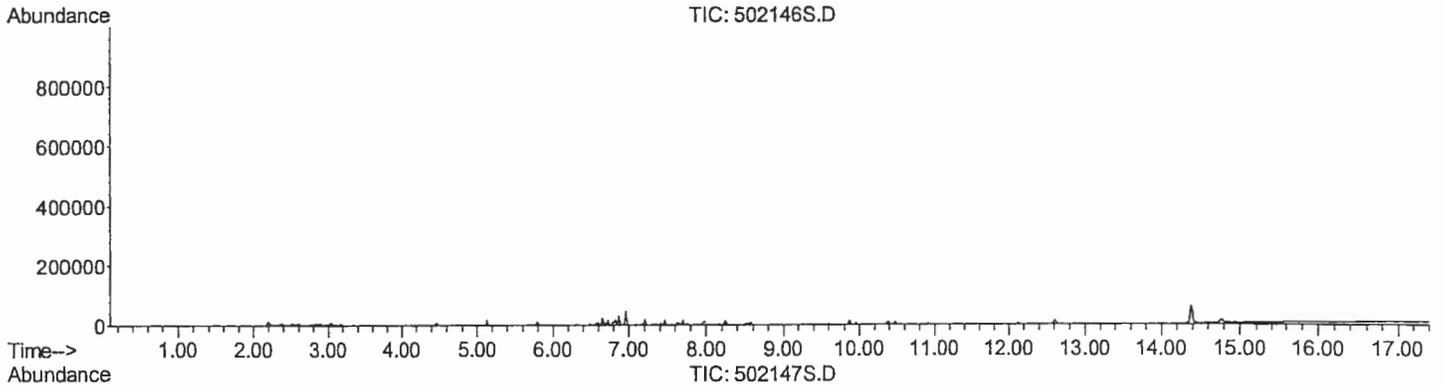
TIC - SITE DKG - PRODUCTION ORDER# 12792893
In Numerical Order



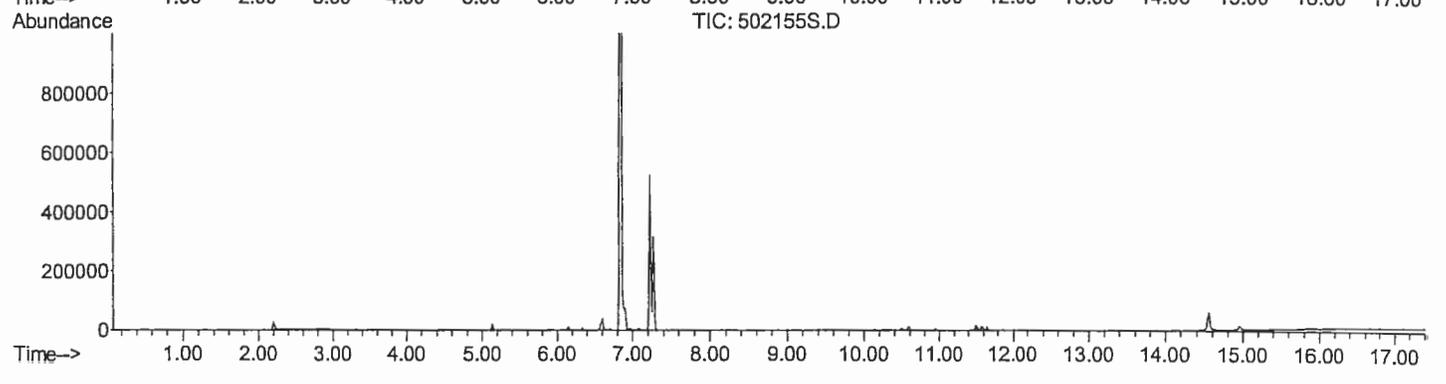
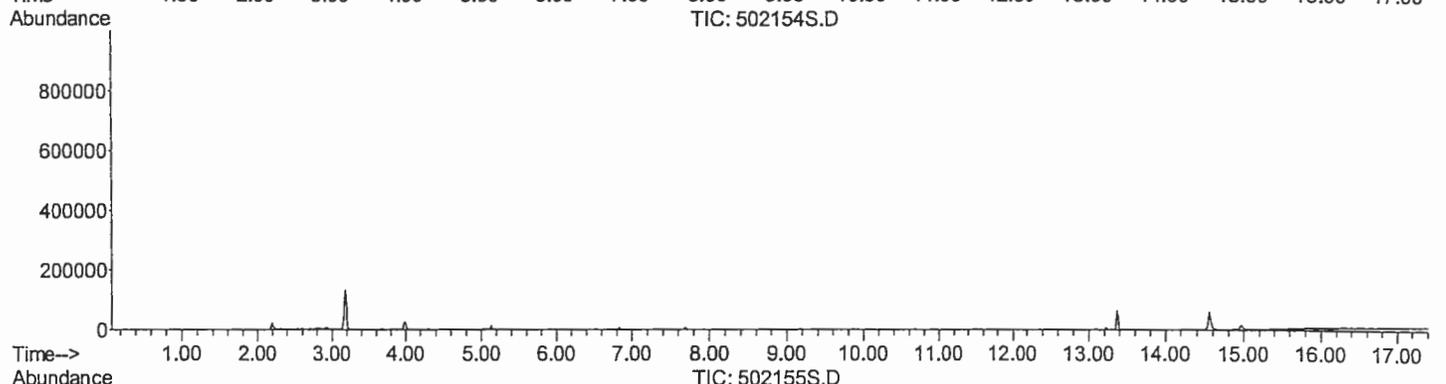
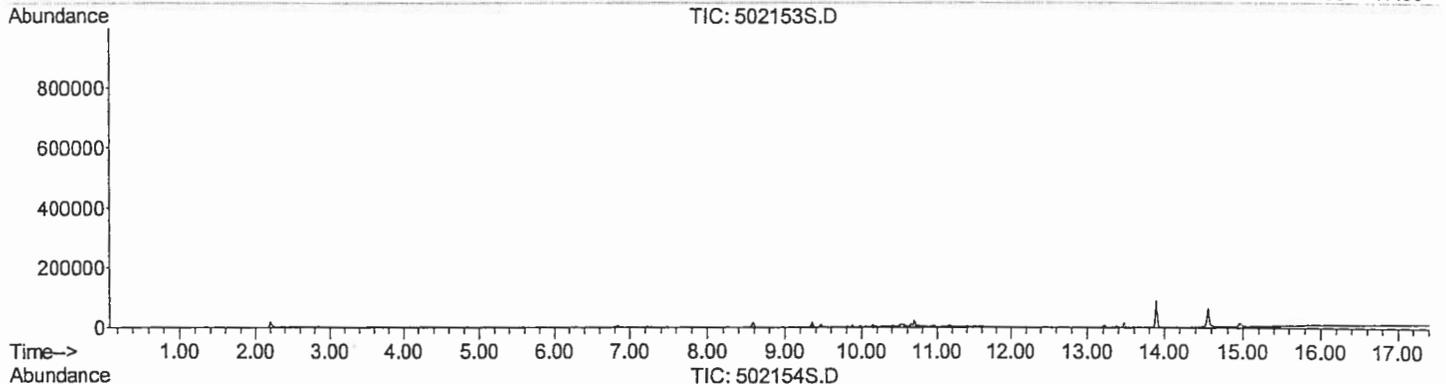
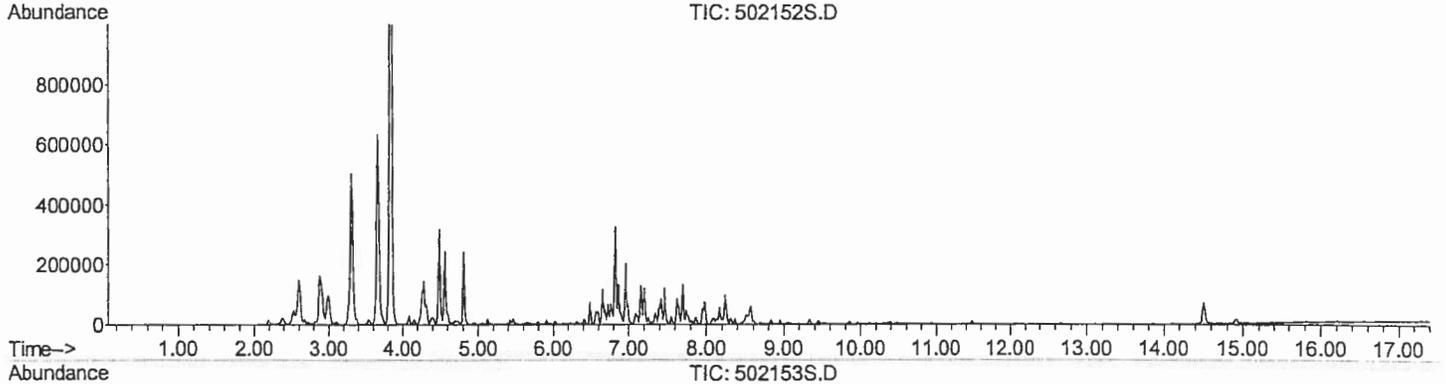
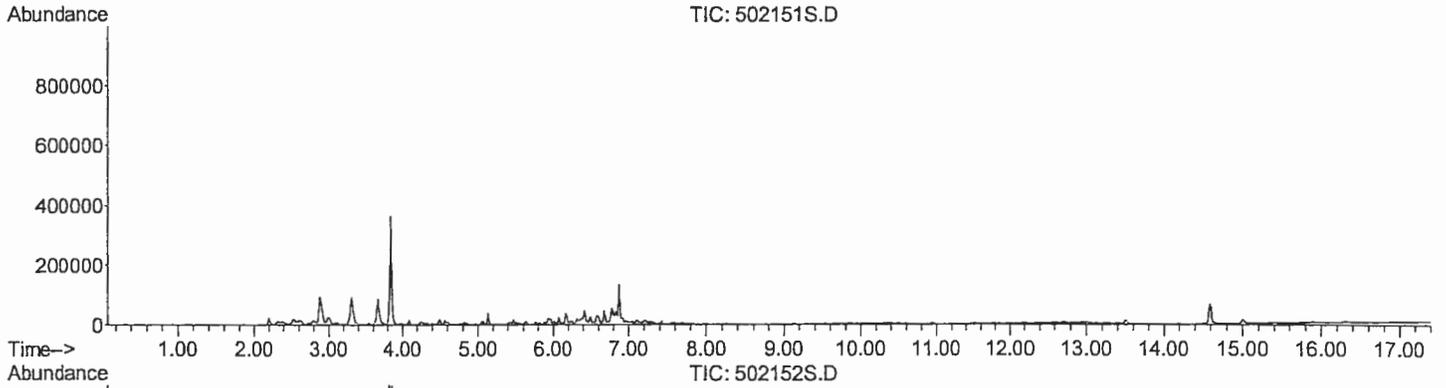
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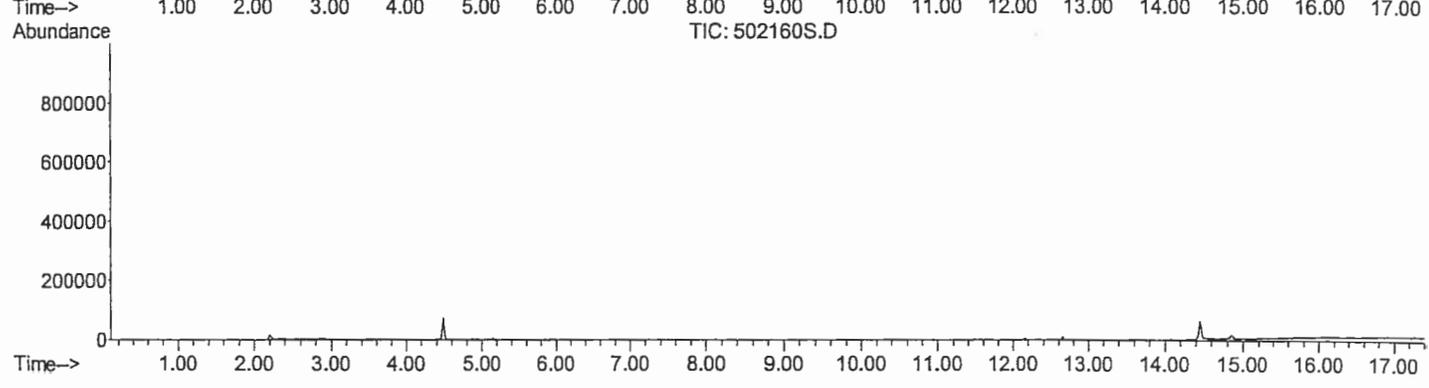
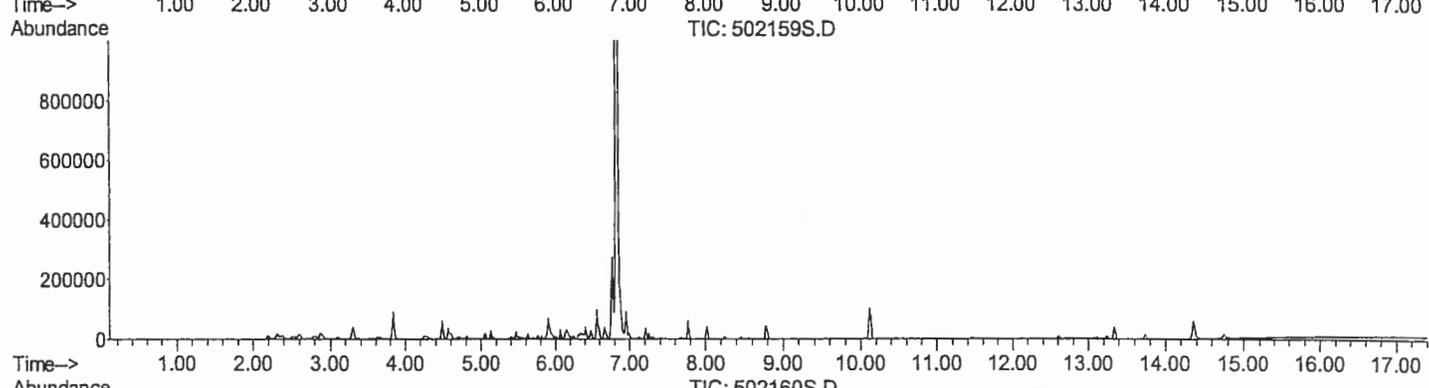
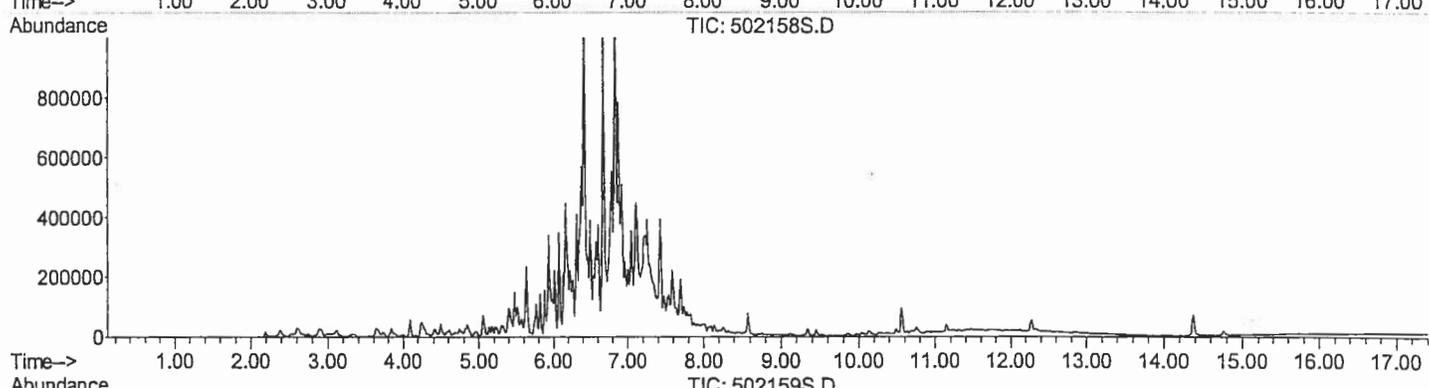
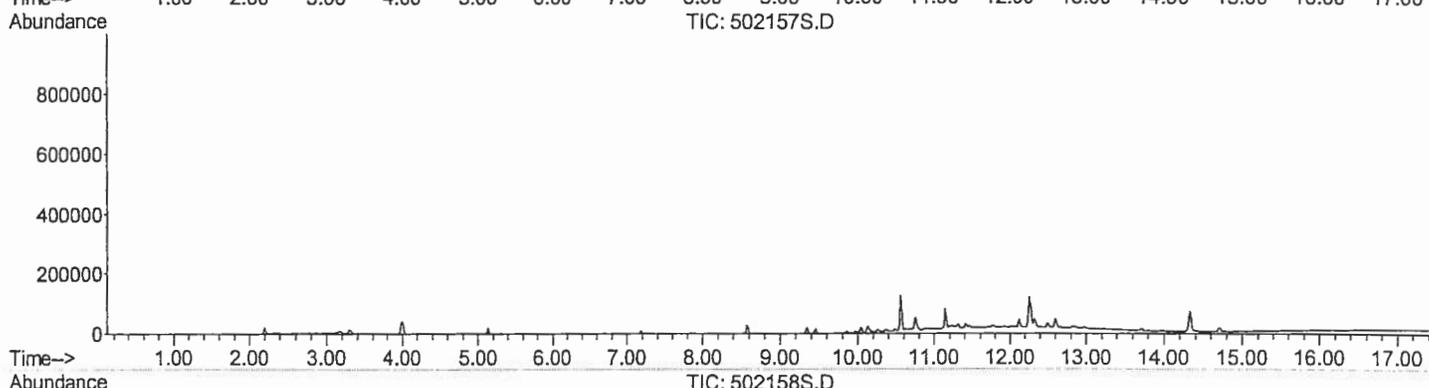
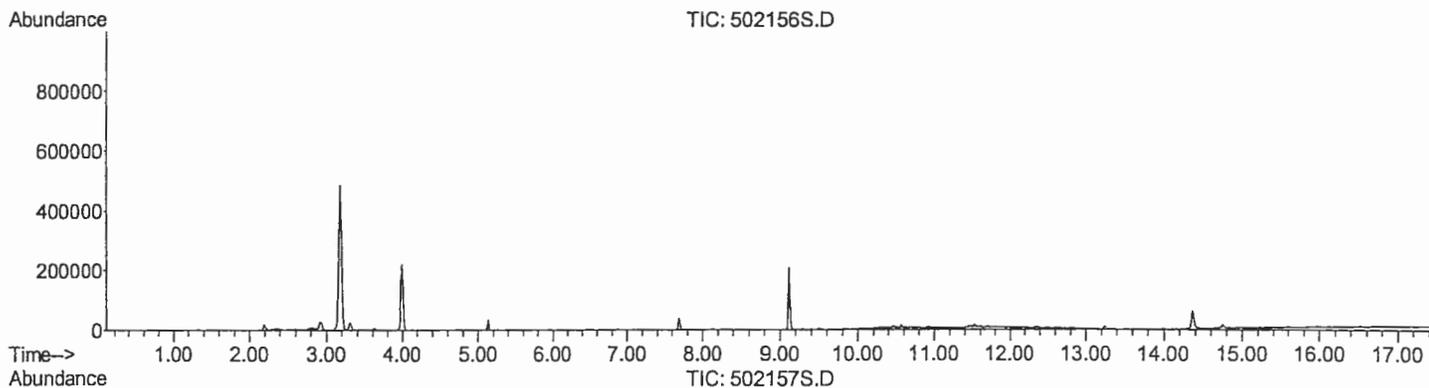
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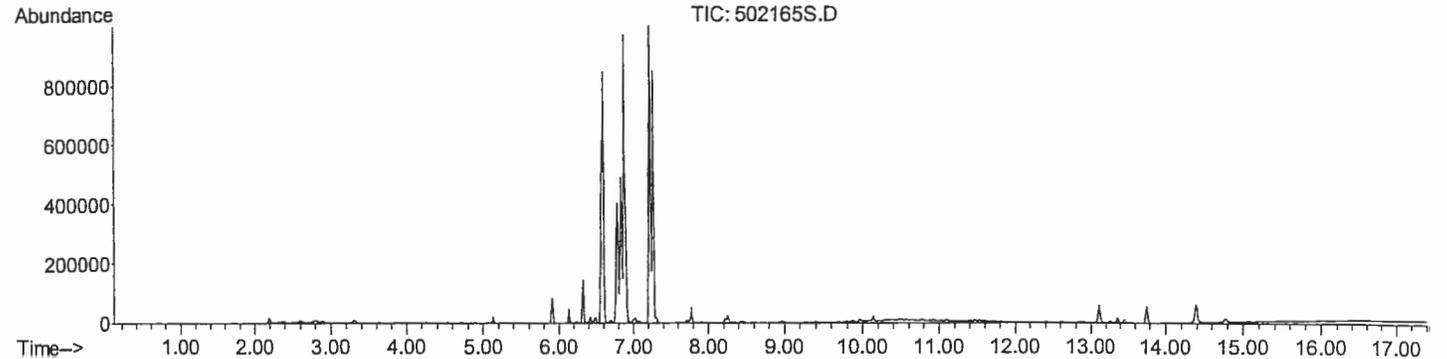
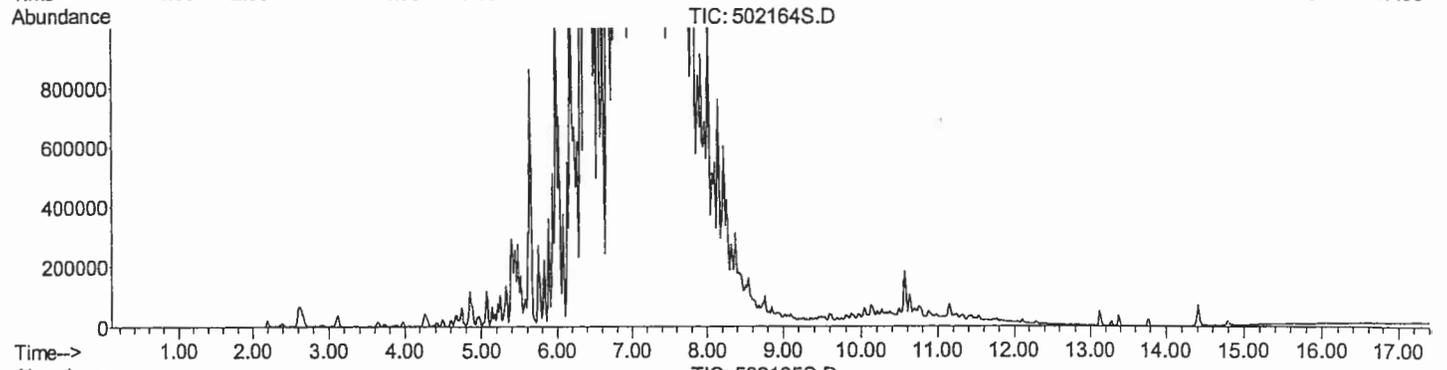
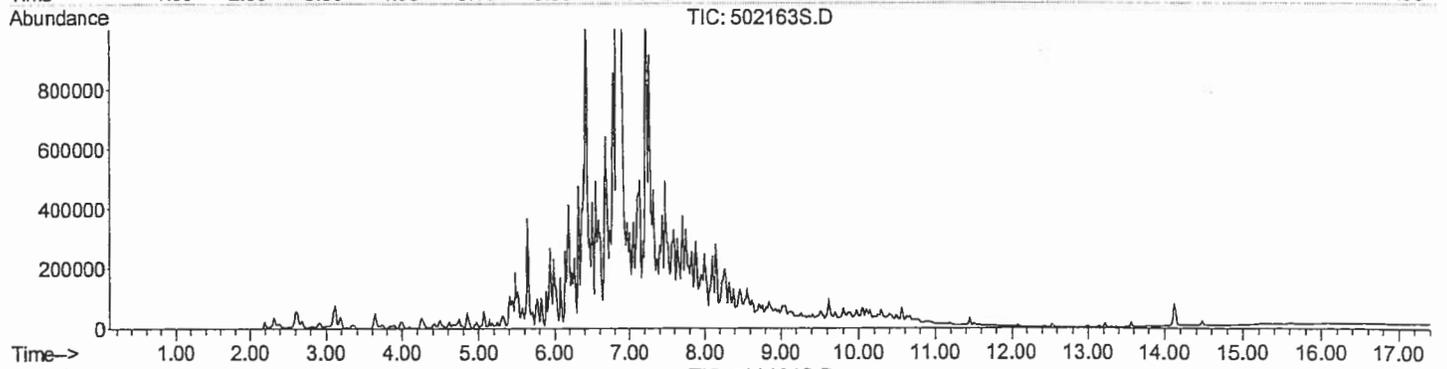
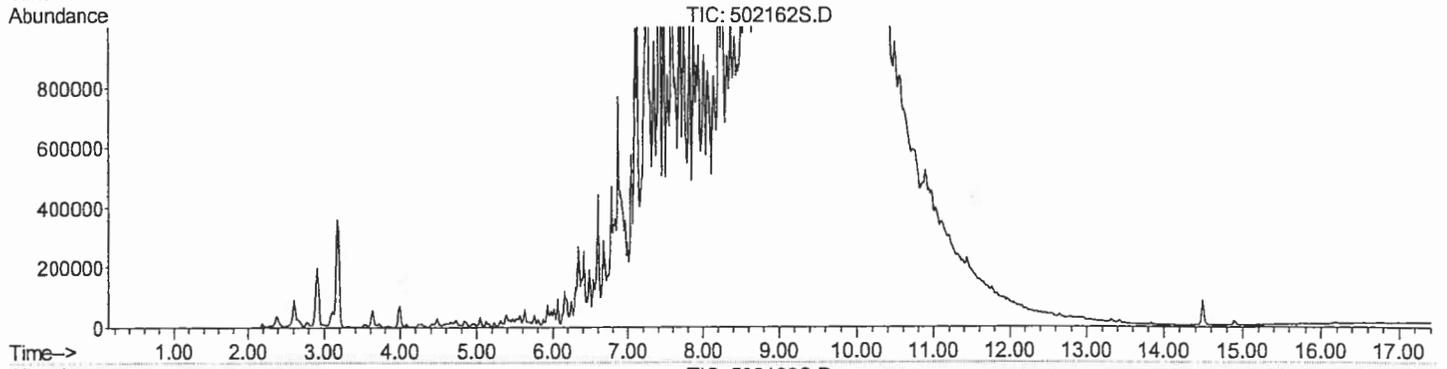
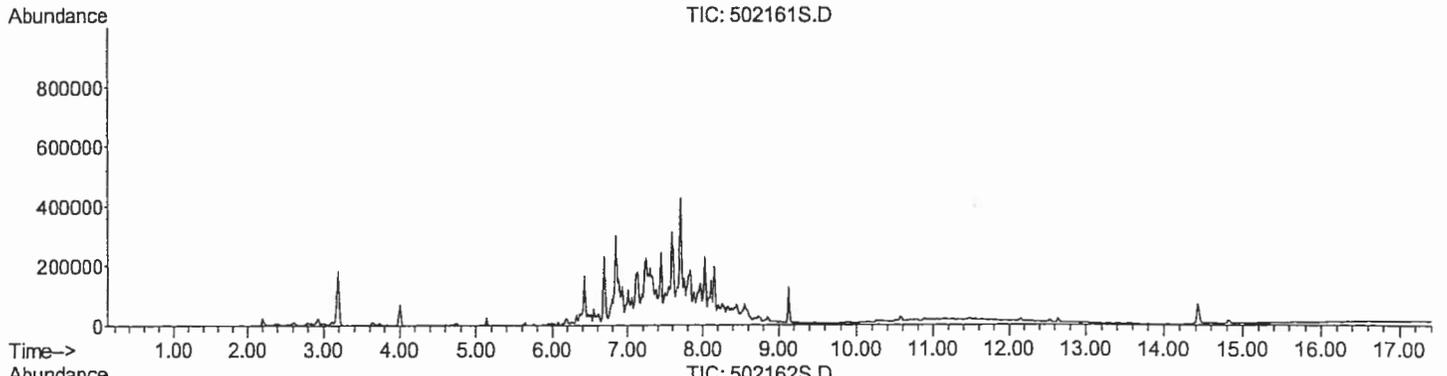
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In Numerical Order



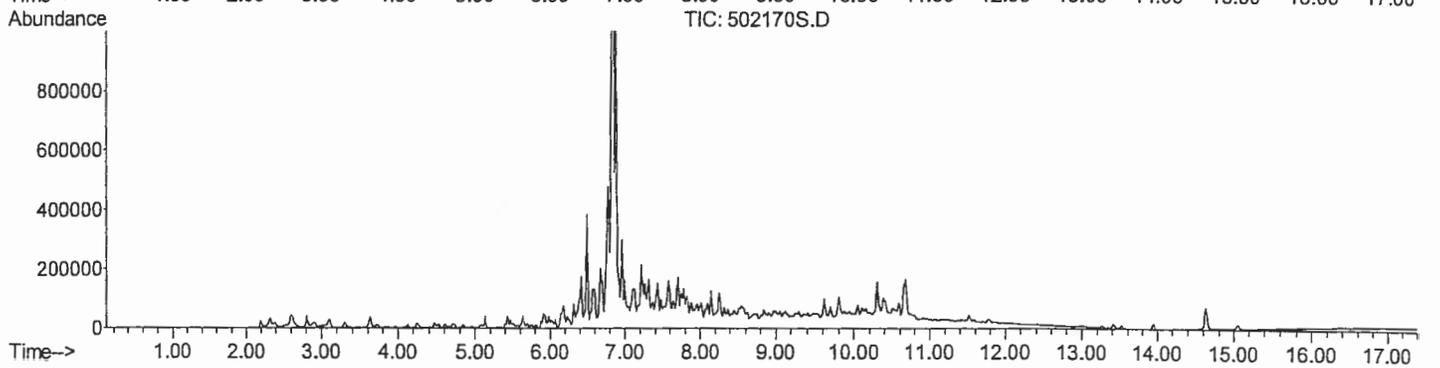
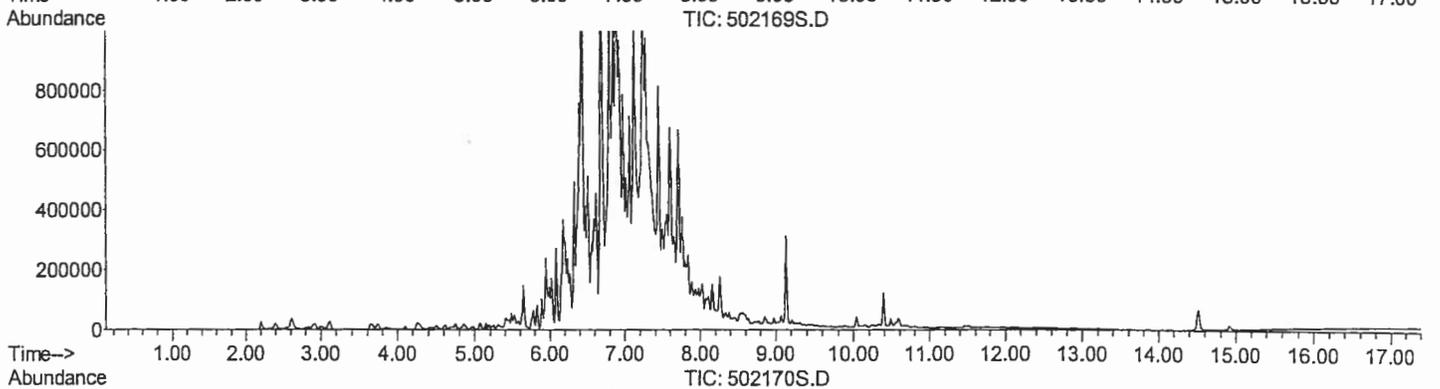
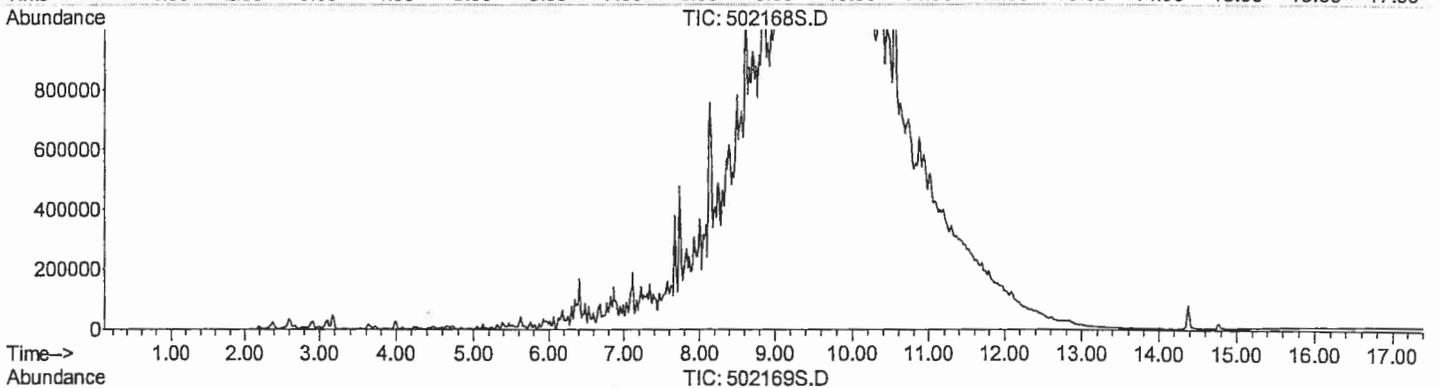
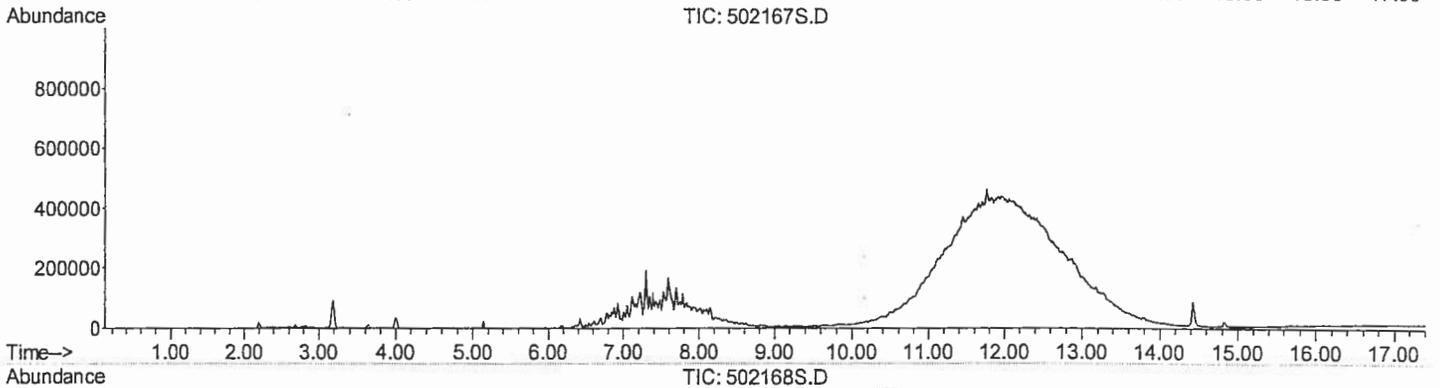
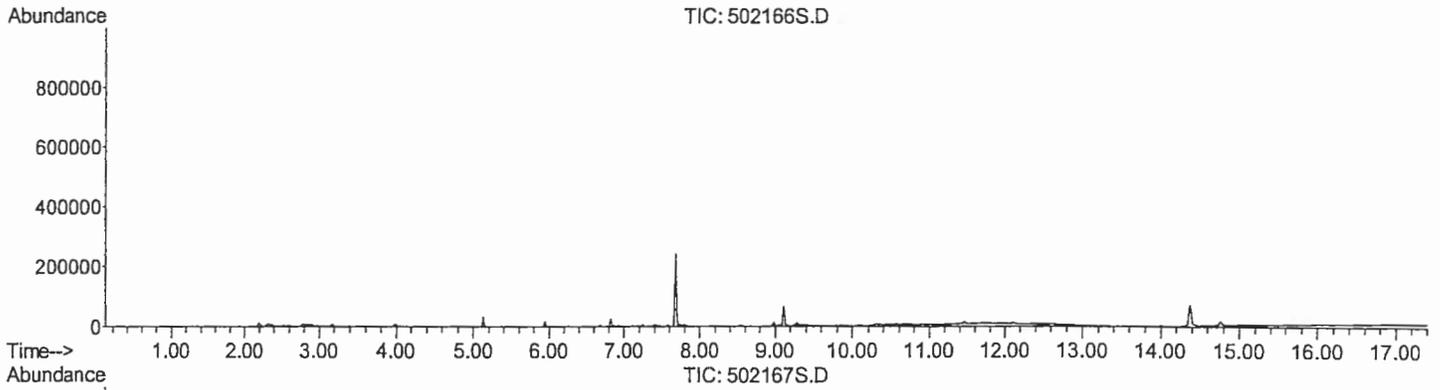
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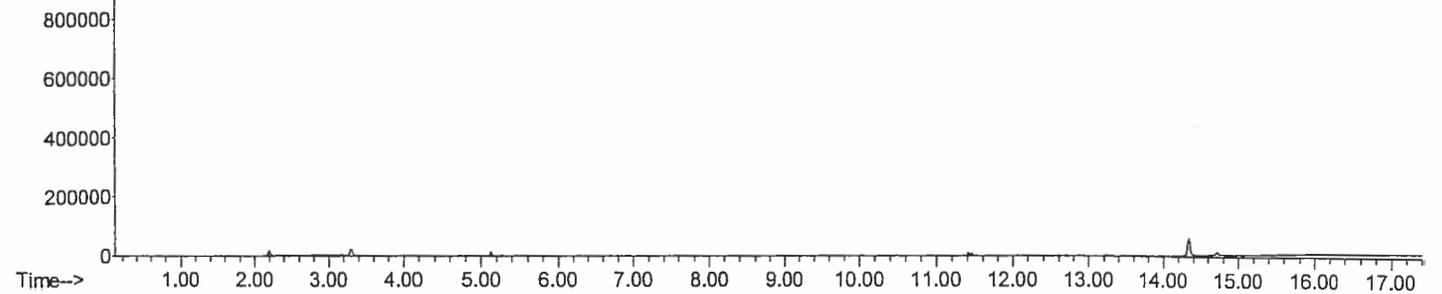
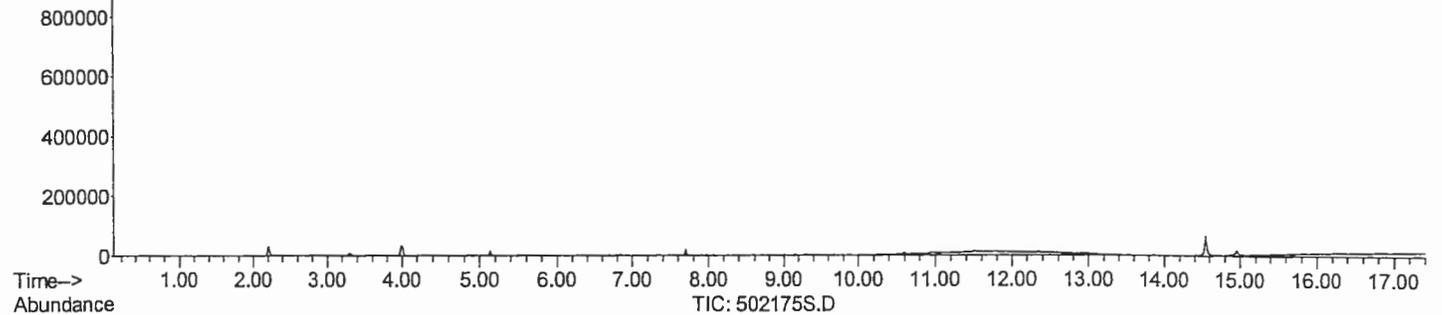
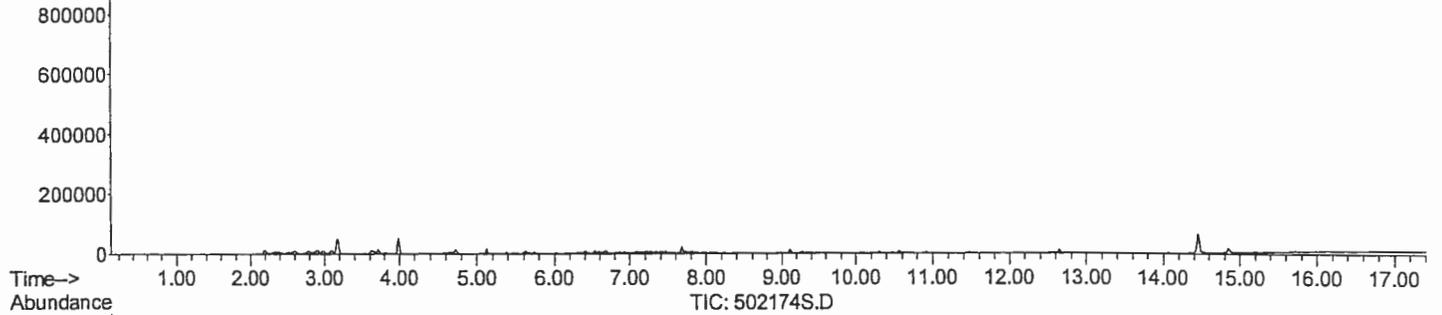
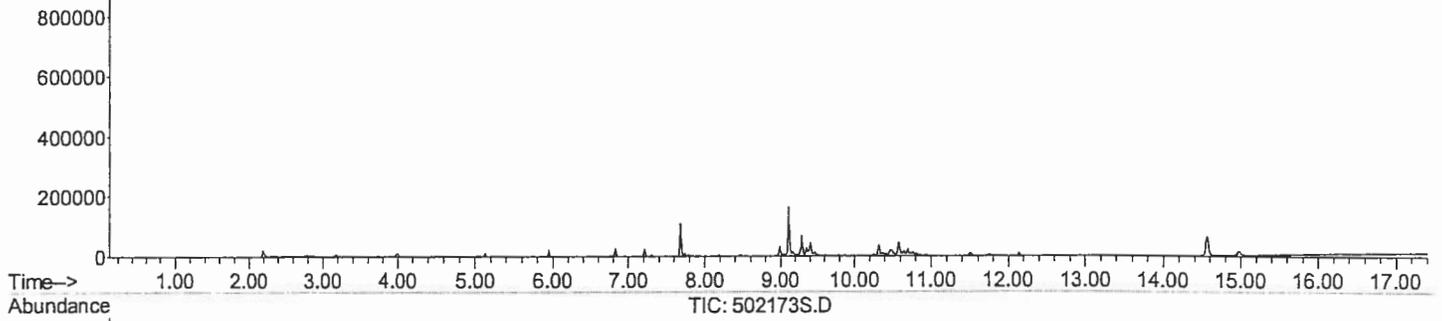
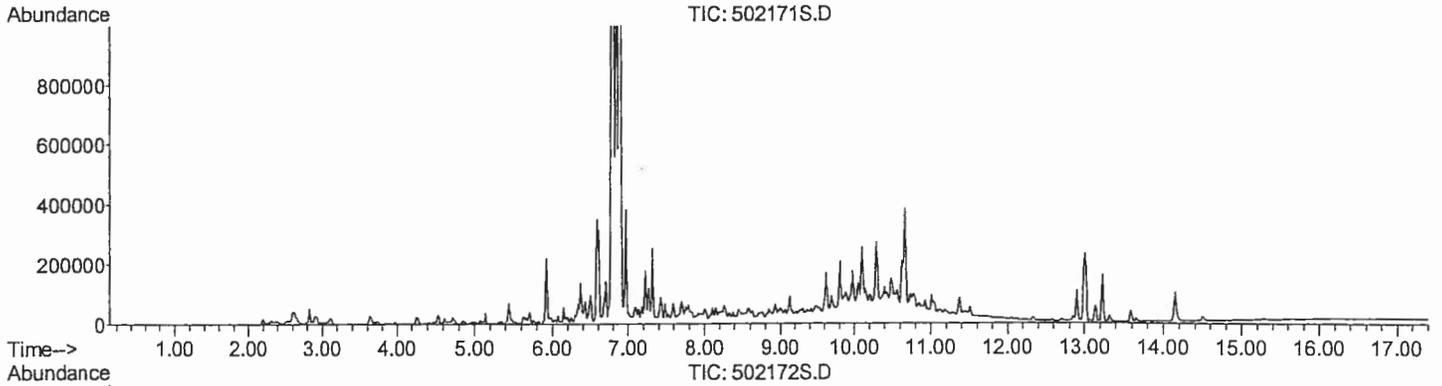
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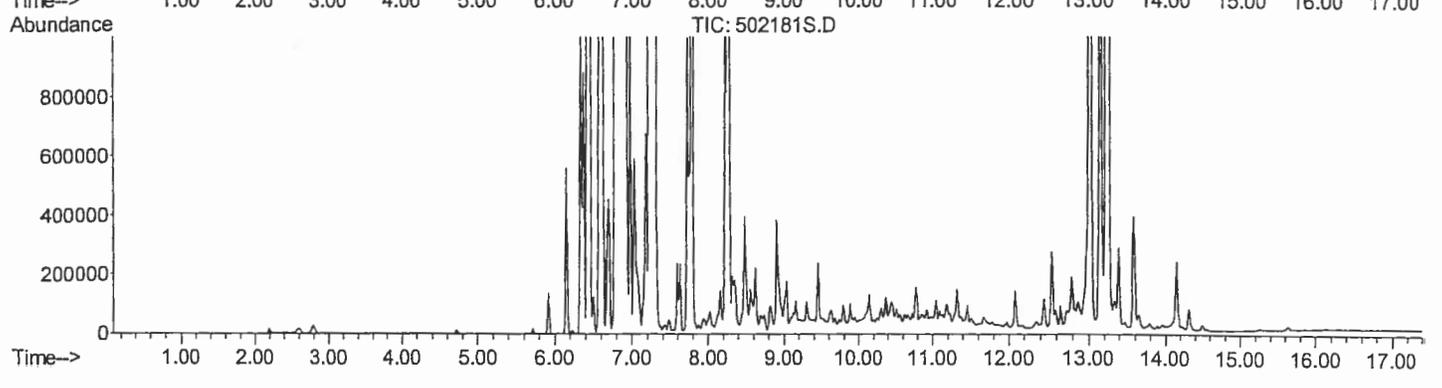
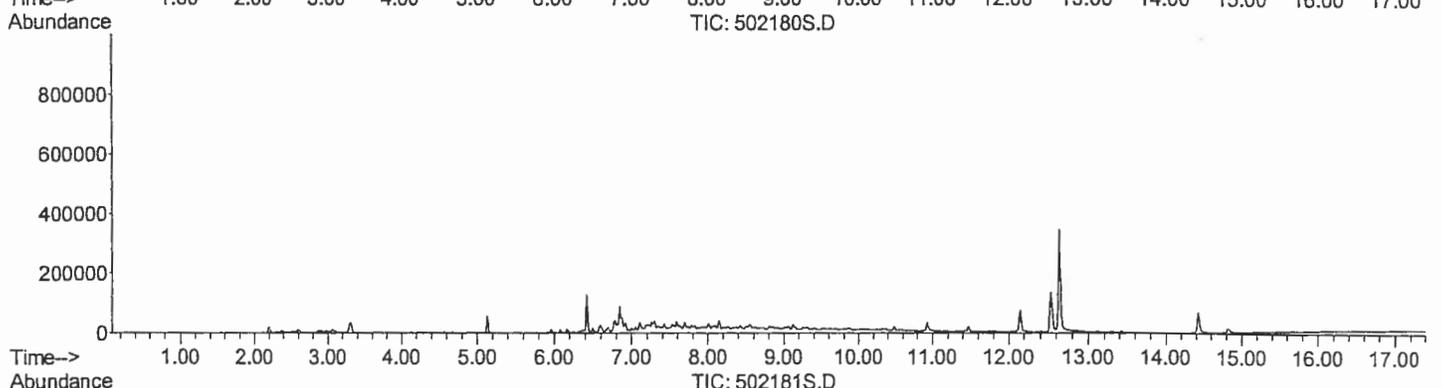
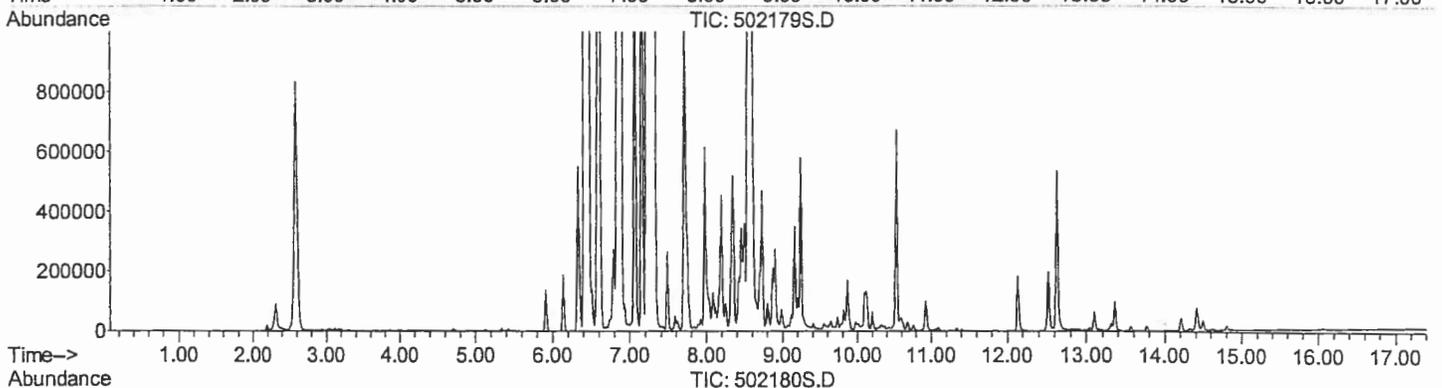
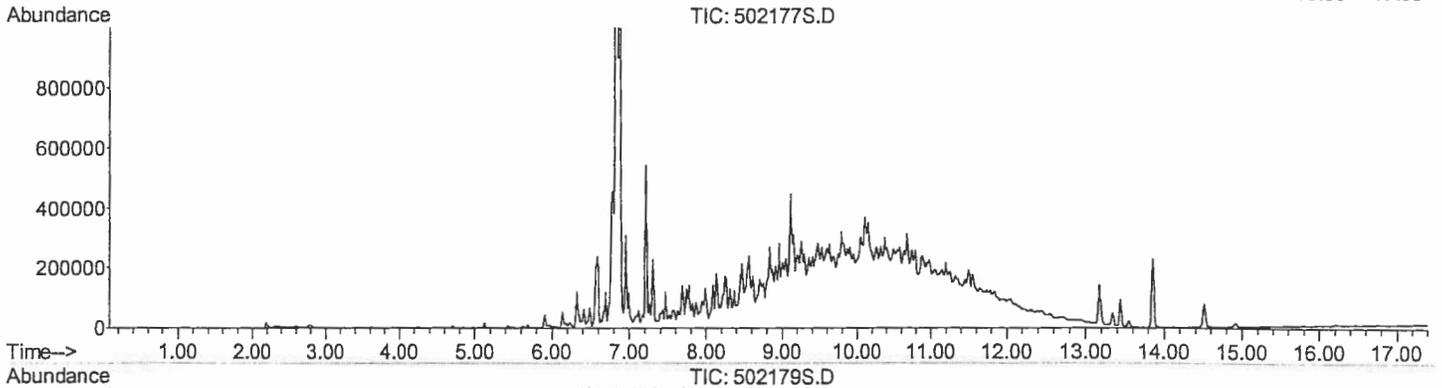
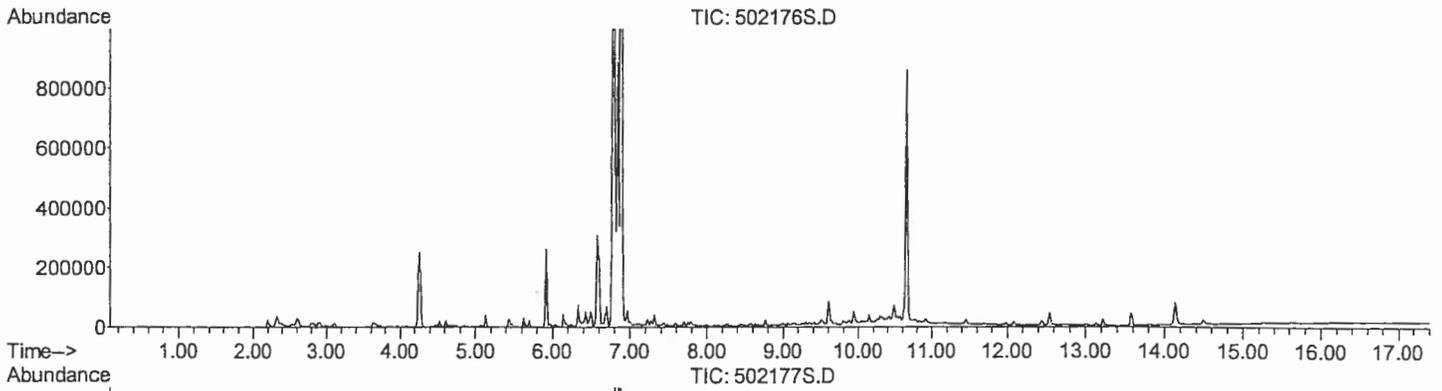
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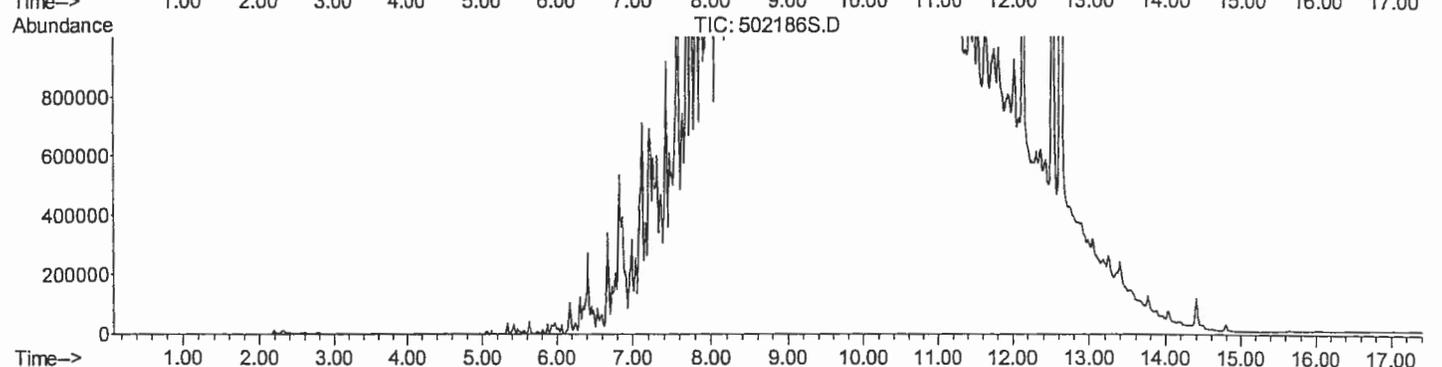
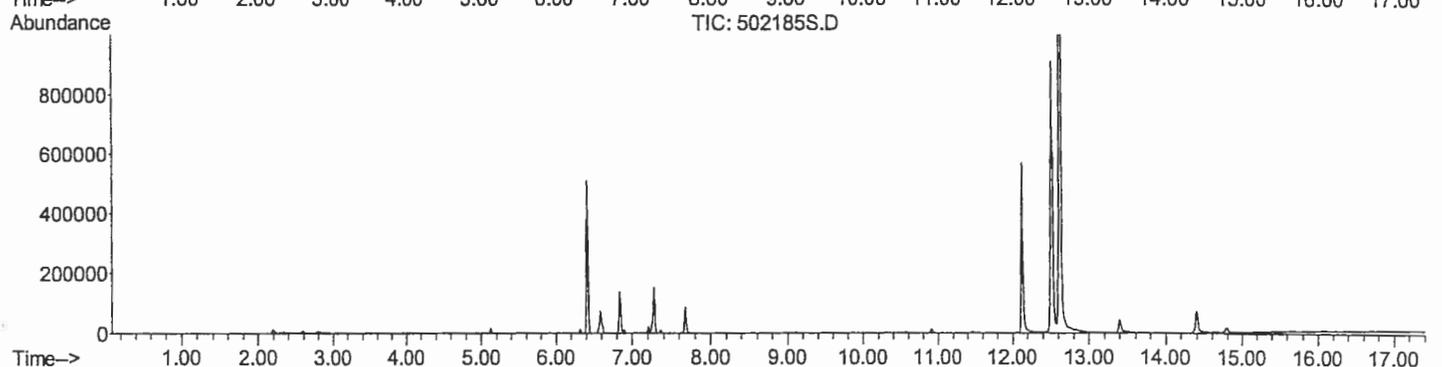
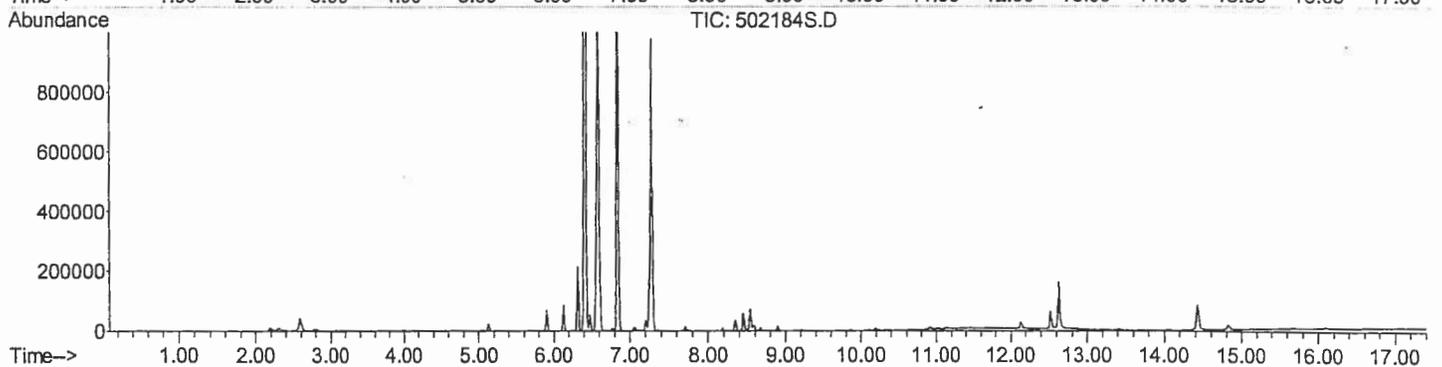
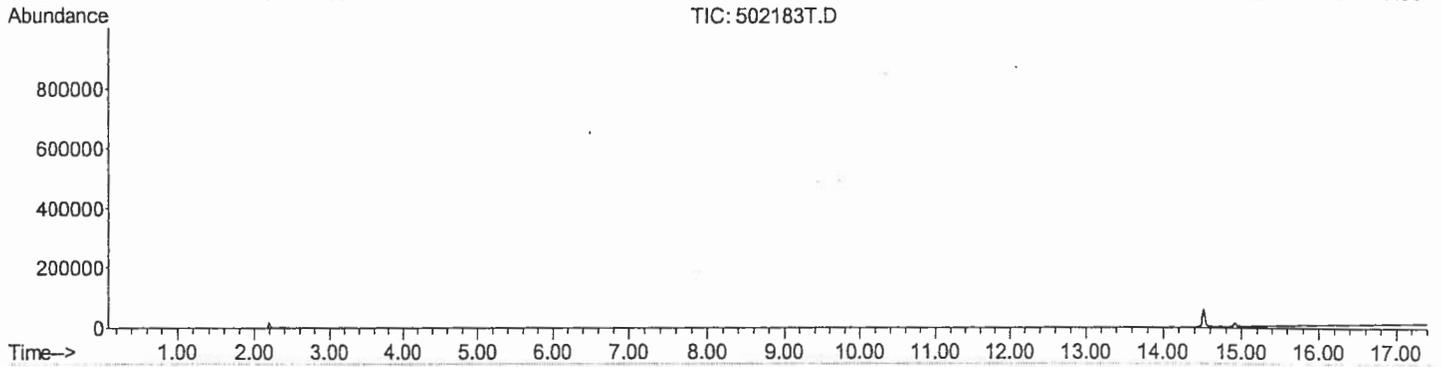
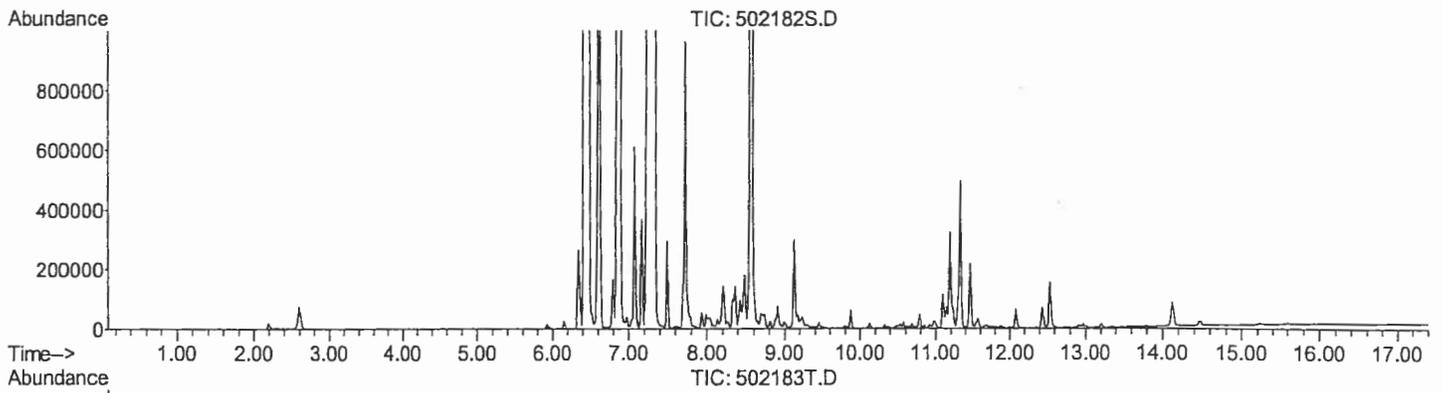
TIC - SITE DKG - PRODUCTION ORDER# 12792893
In Numerical Order



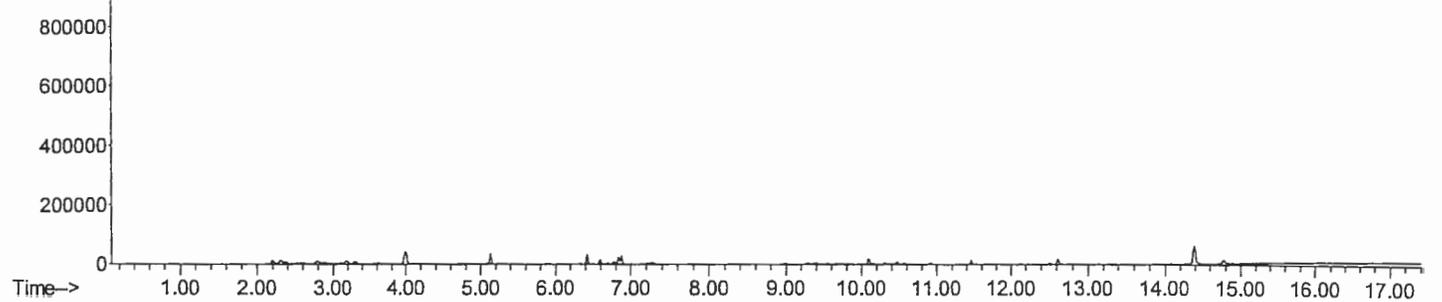
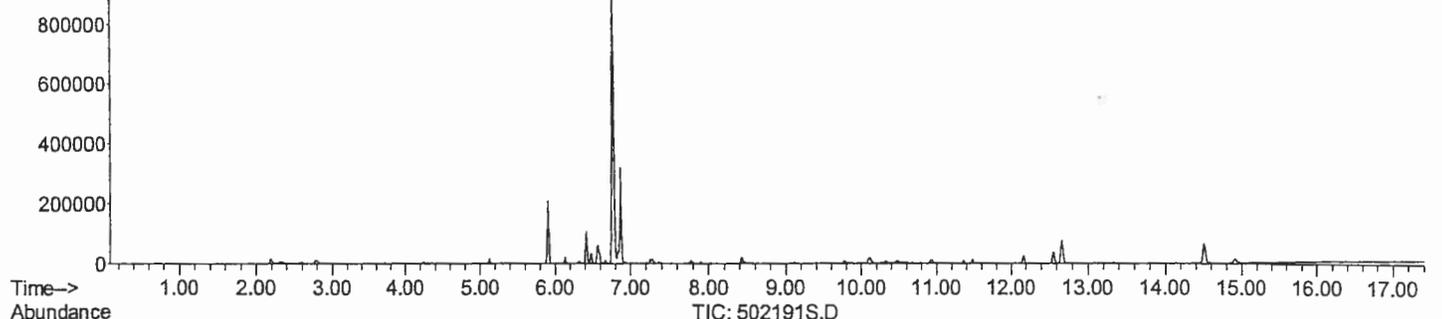
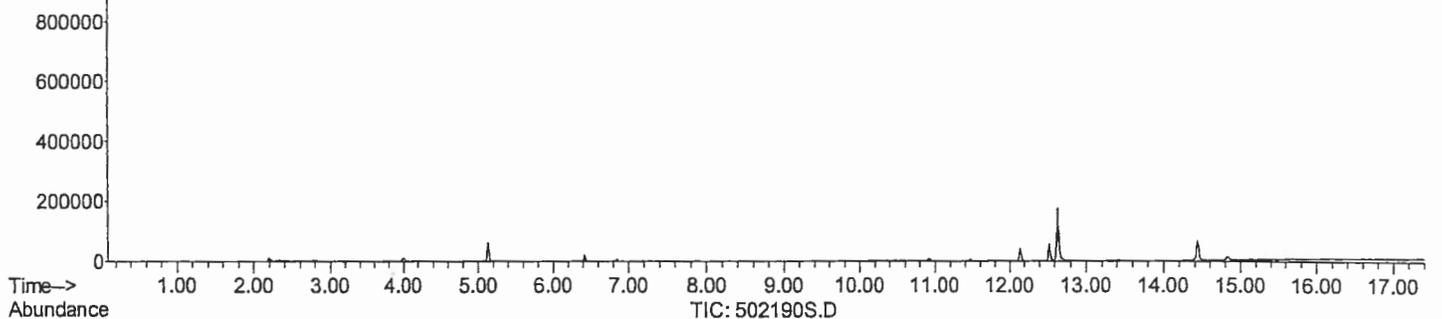
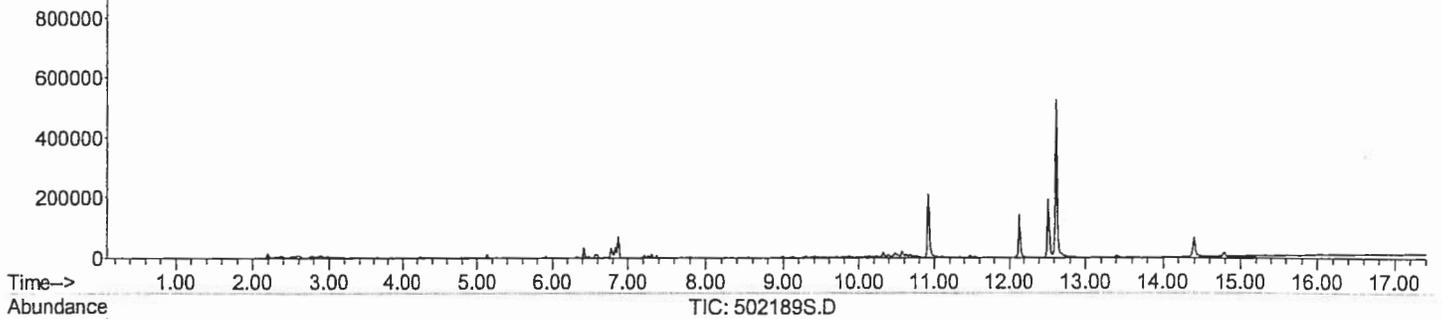
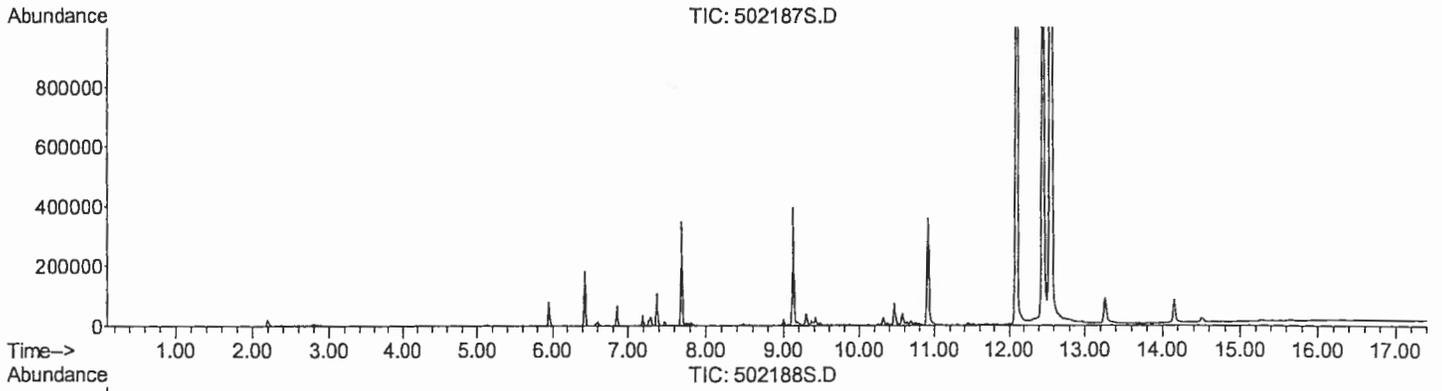
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In Numerical Order



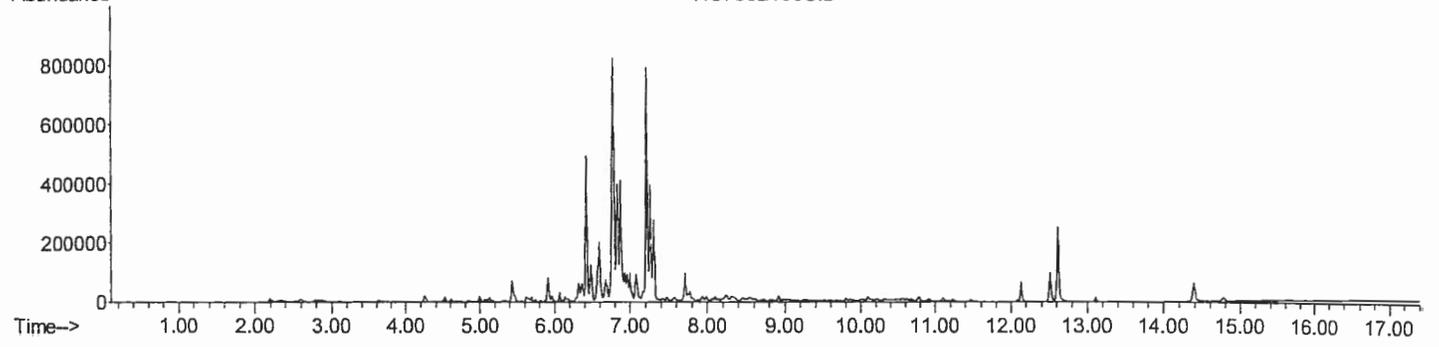
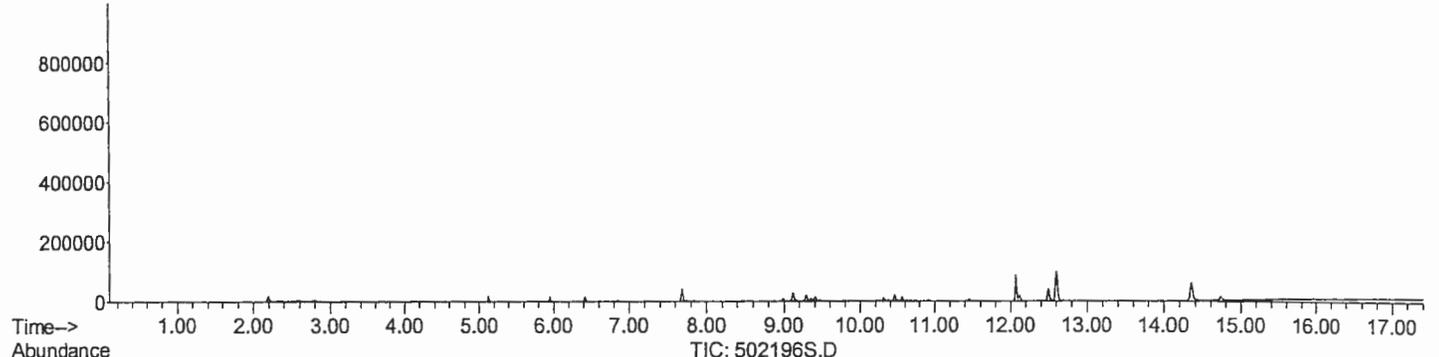
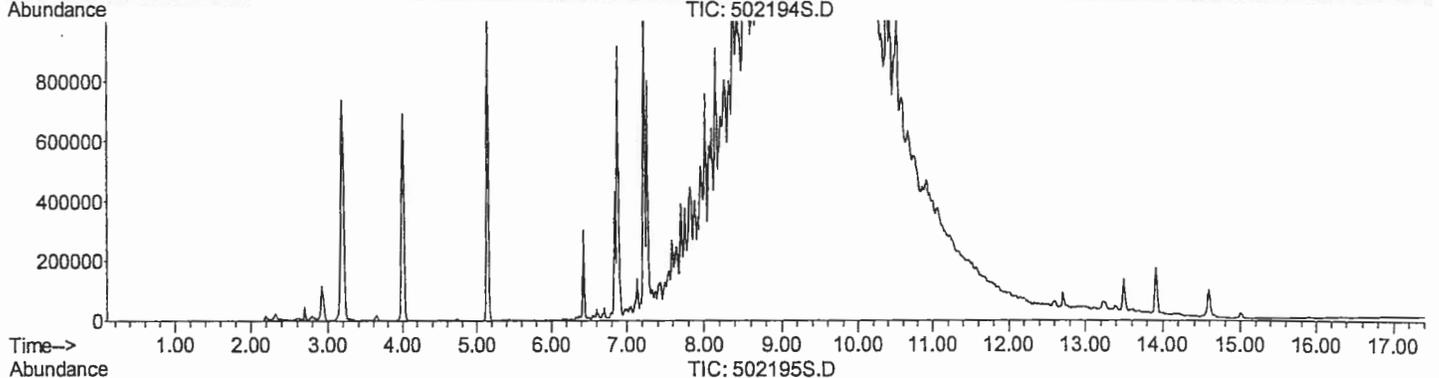
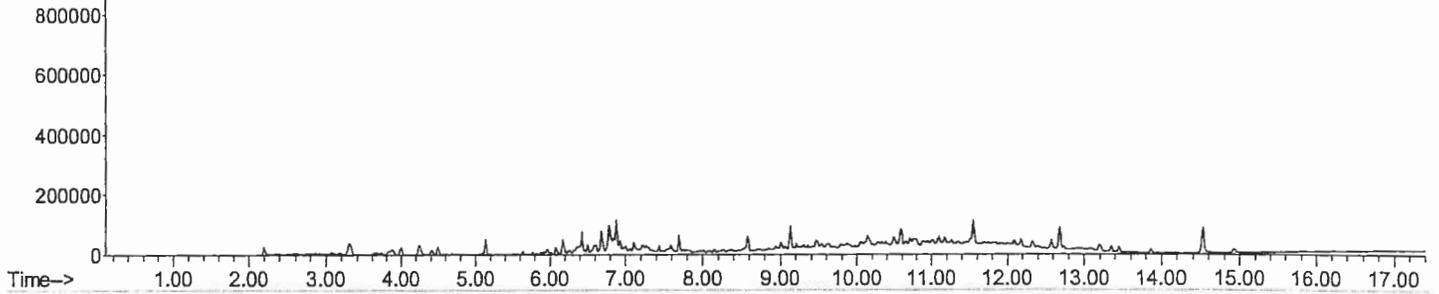
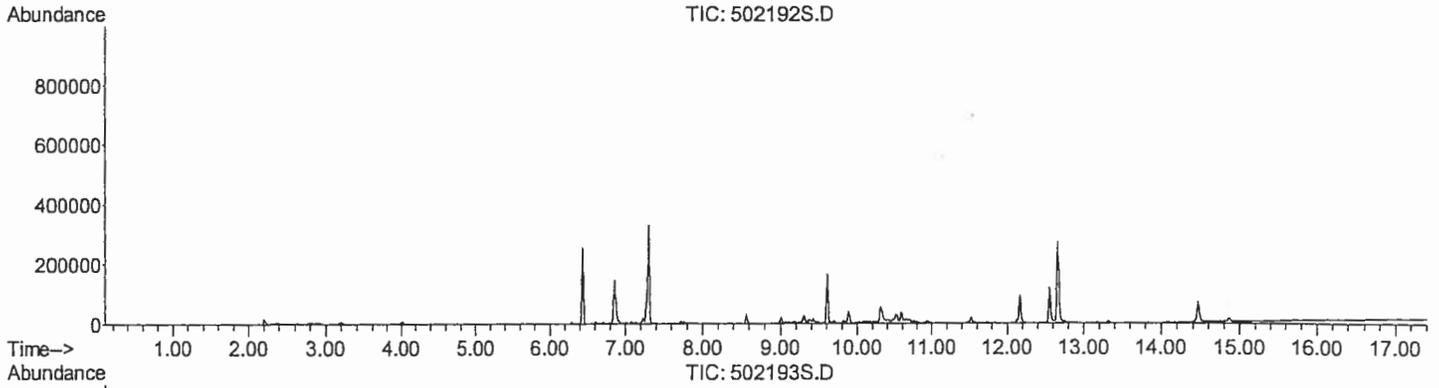
TIC - SITE DKG - PRODUCTION ORDER# 12792893
In Numerical Order



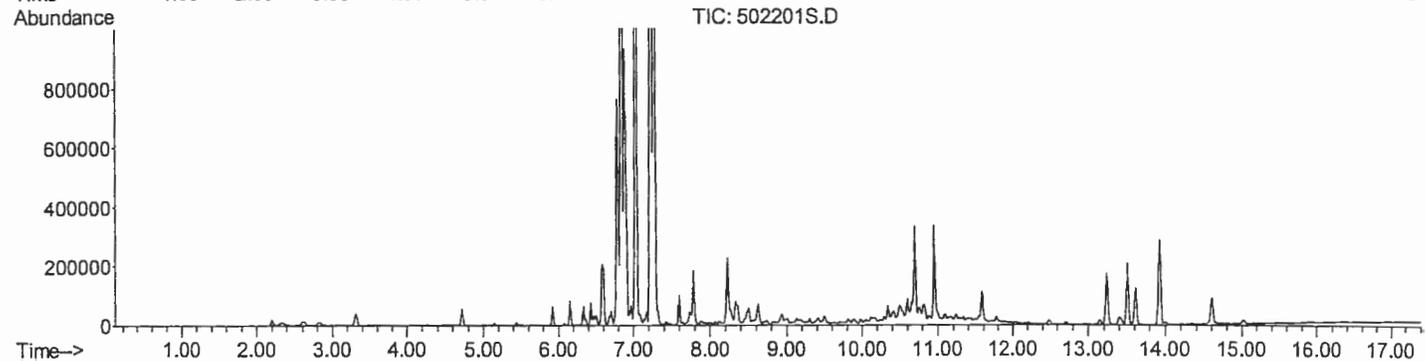
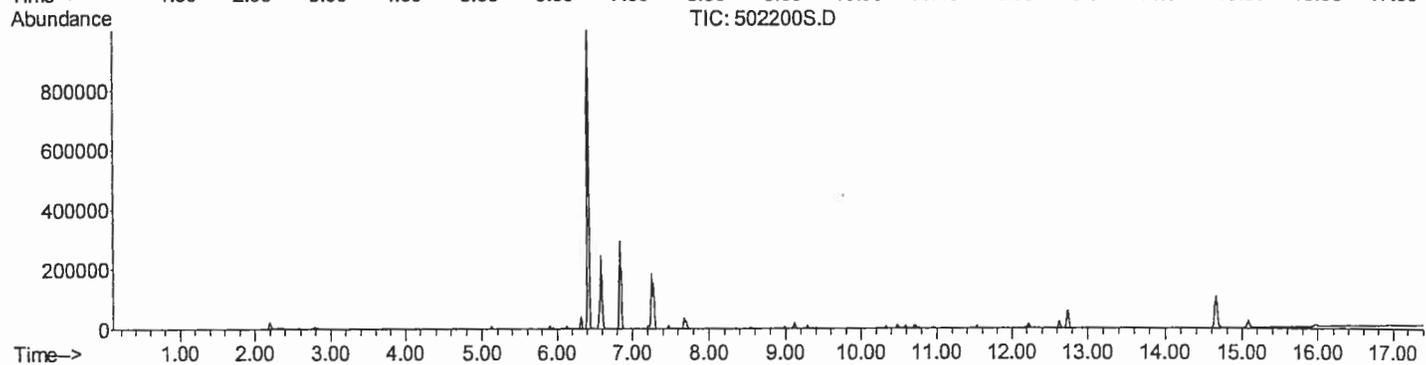
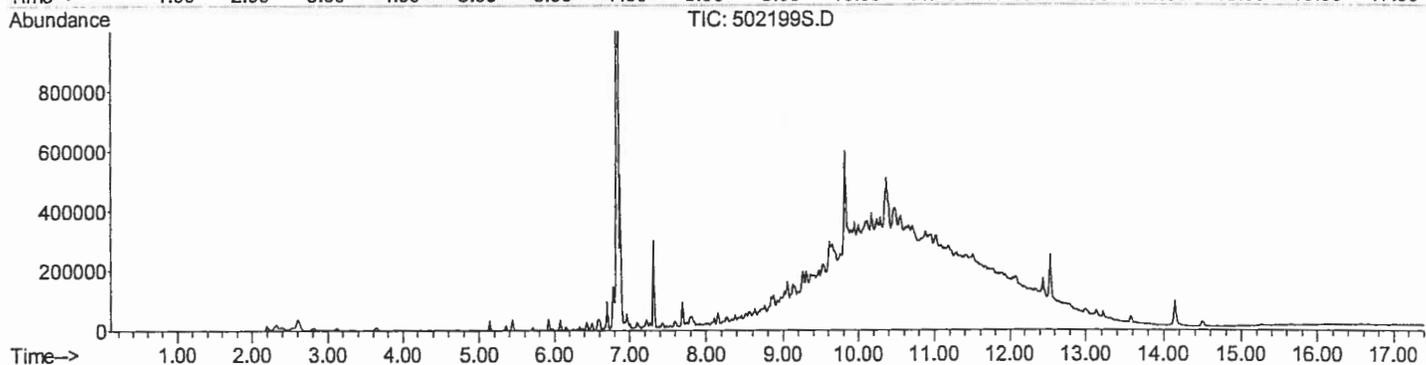
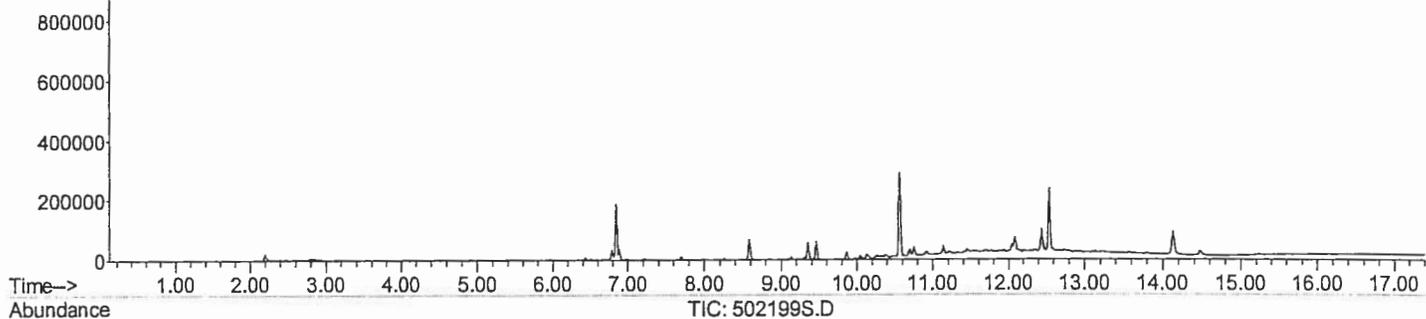
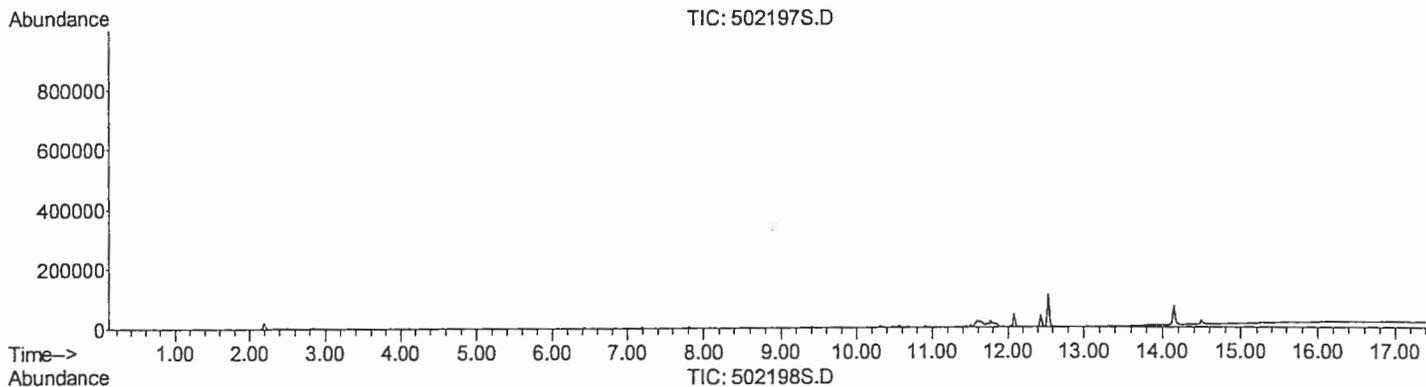
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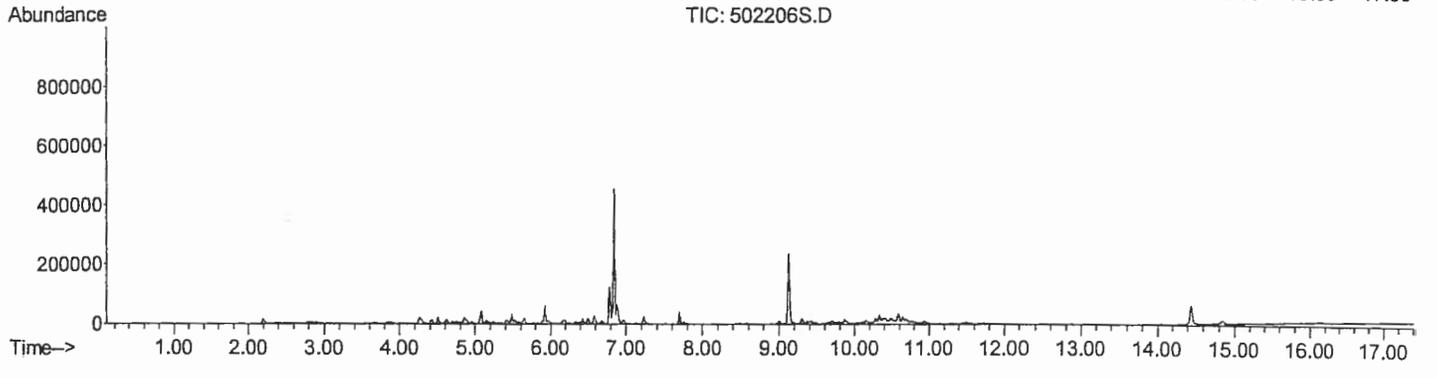
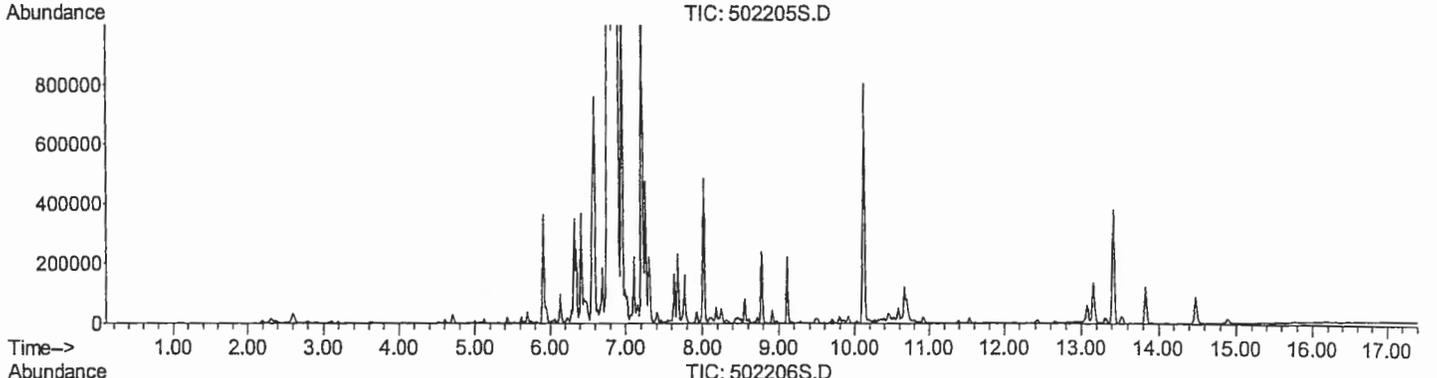
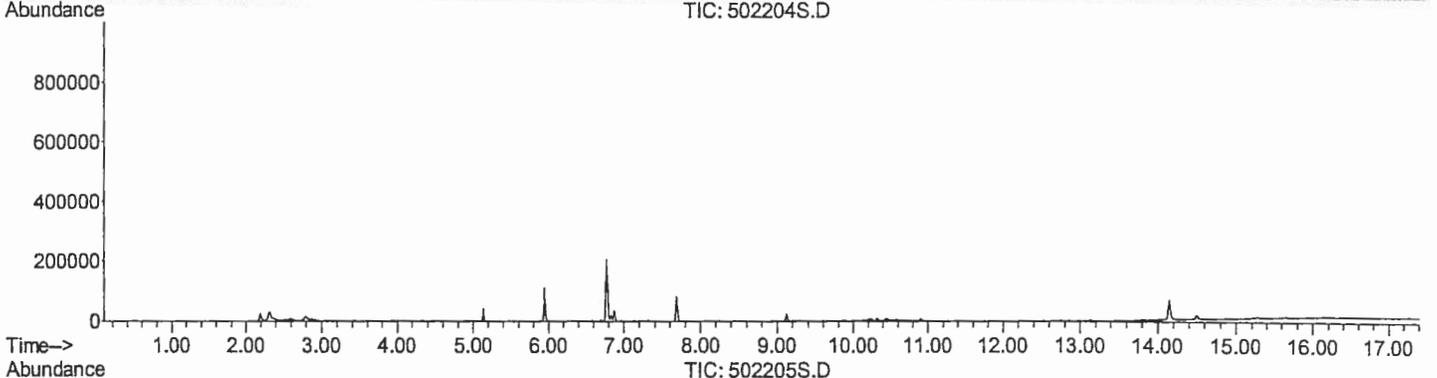
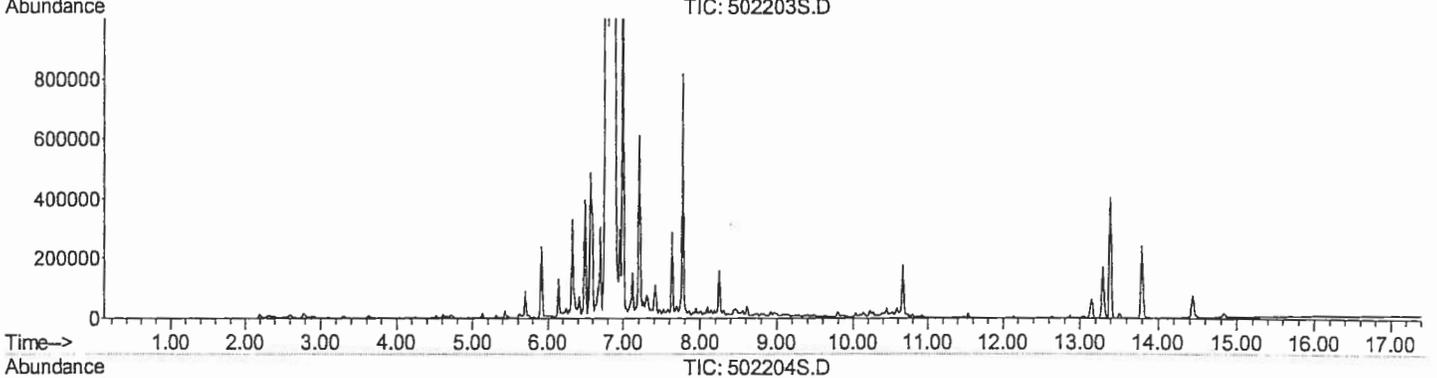
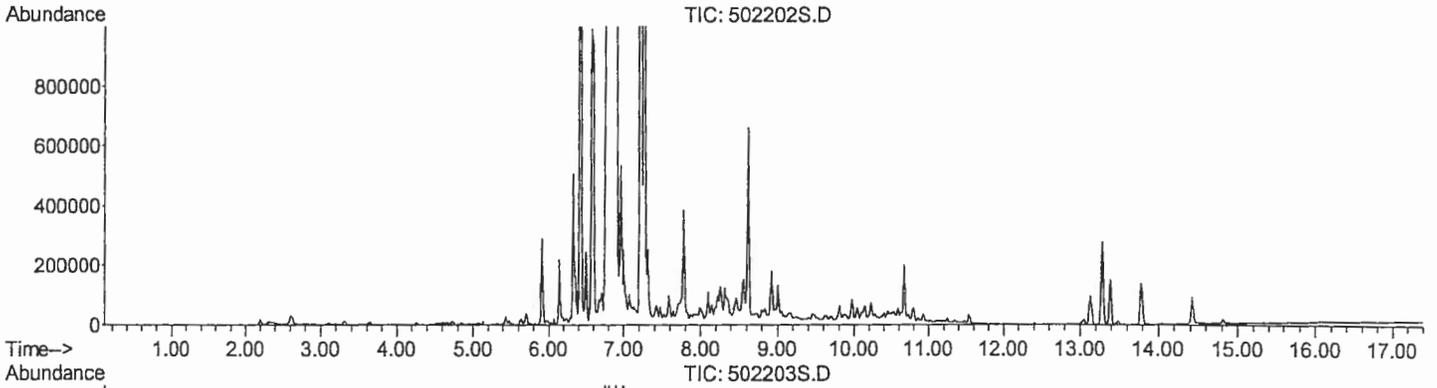
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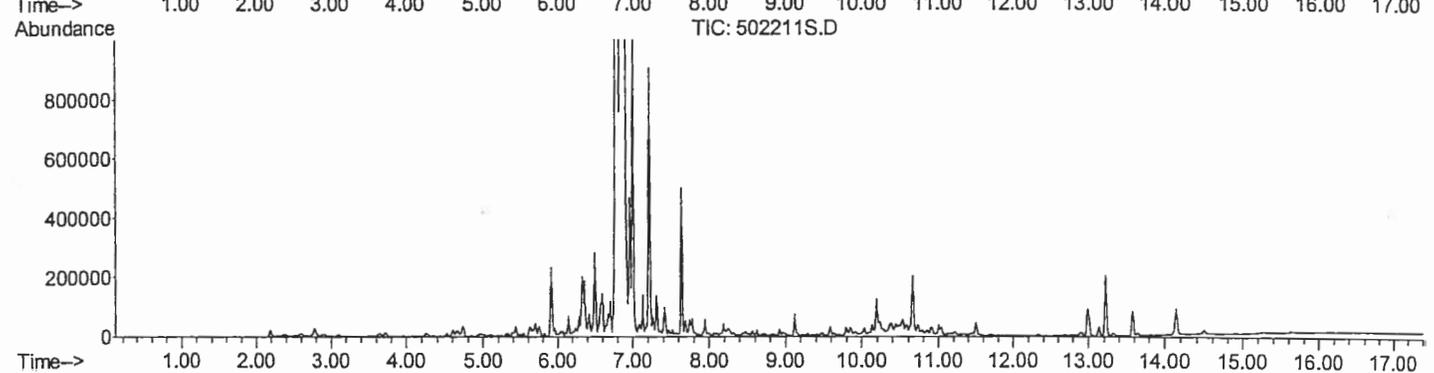
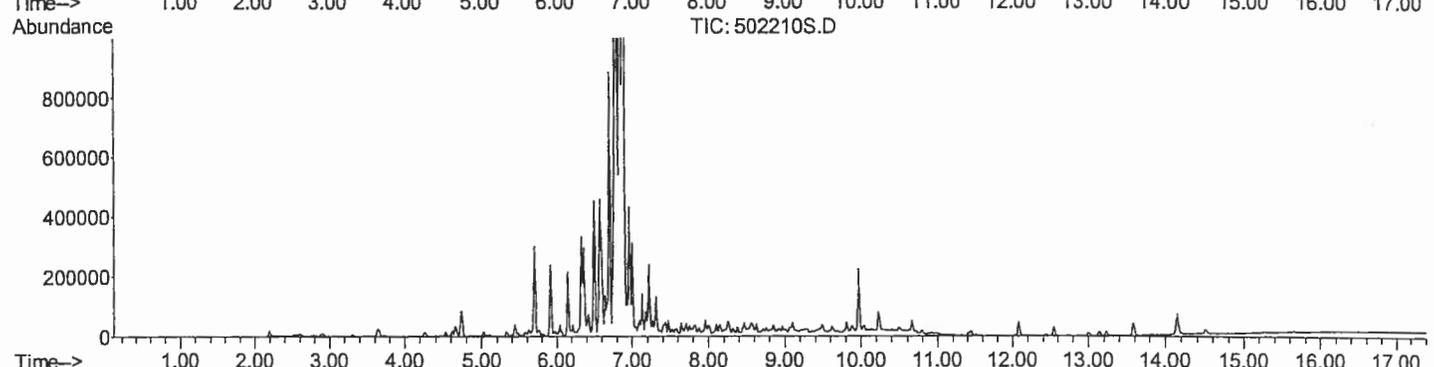
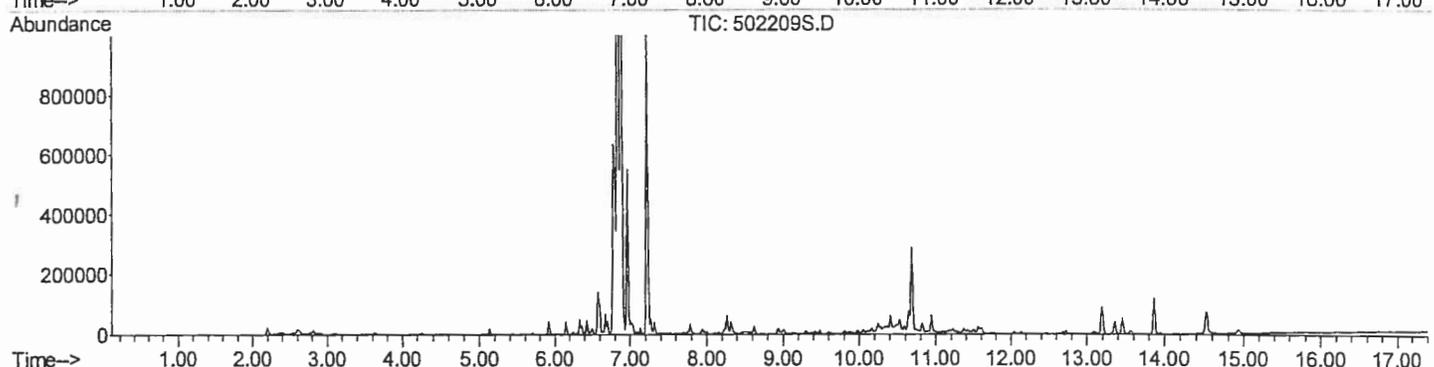
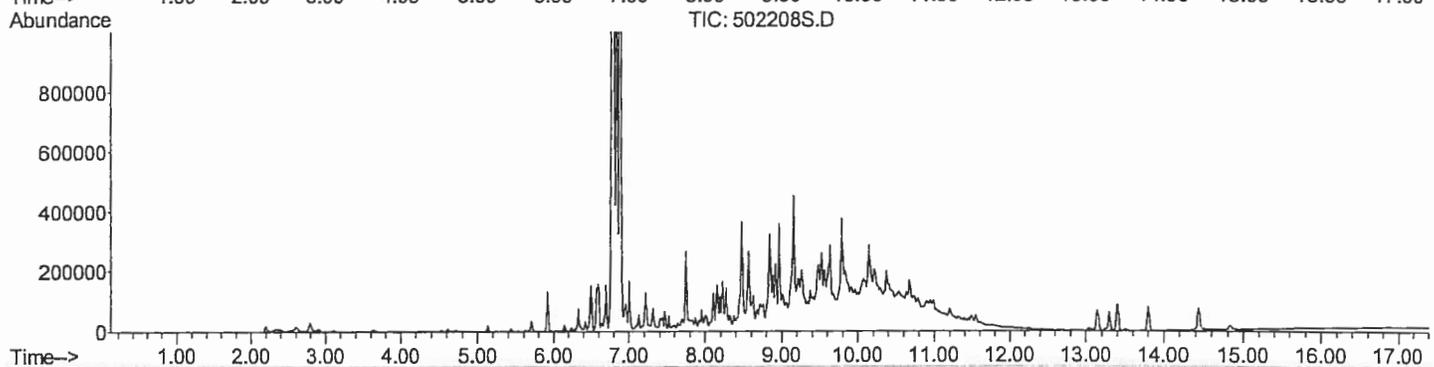
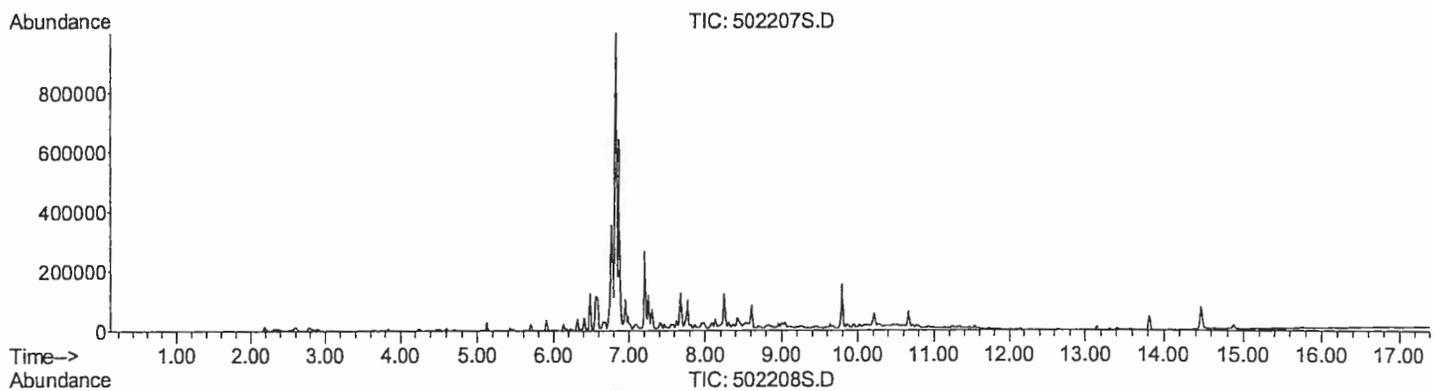
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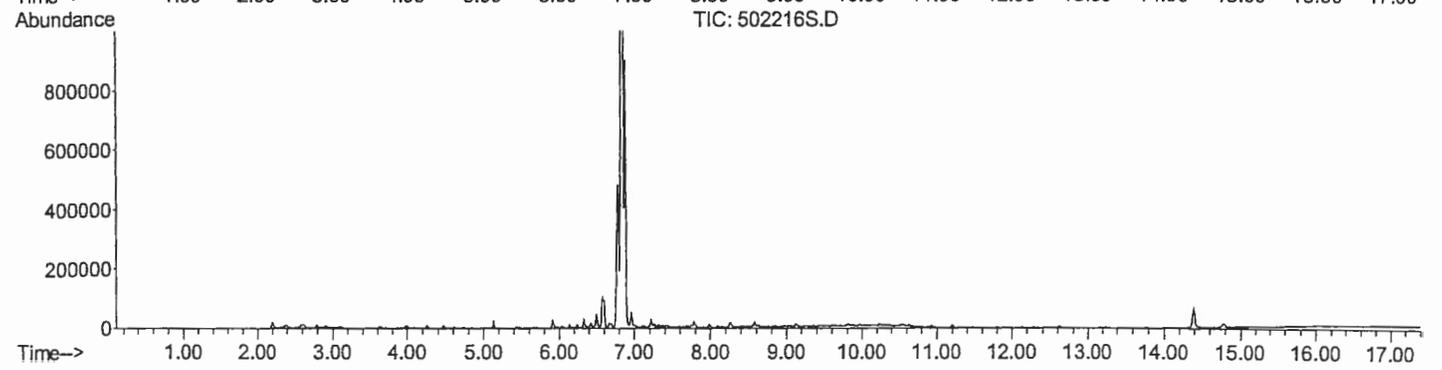
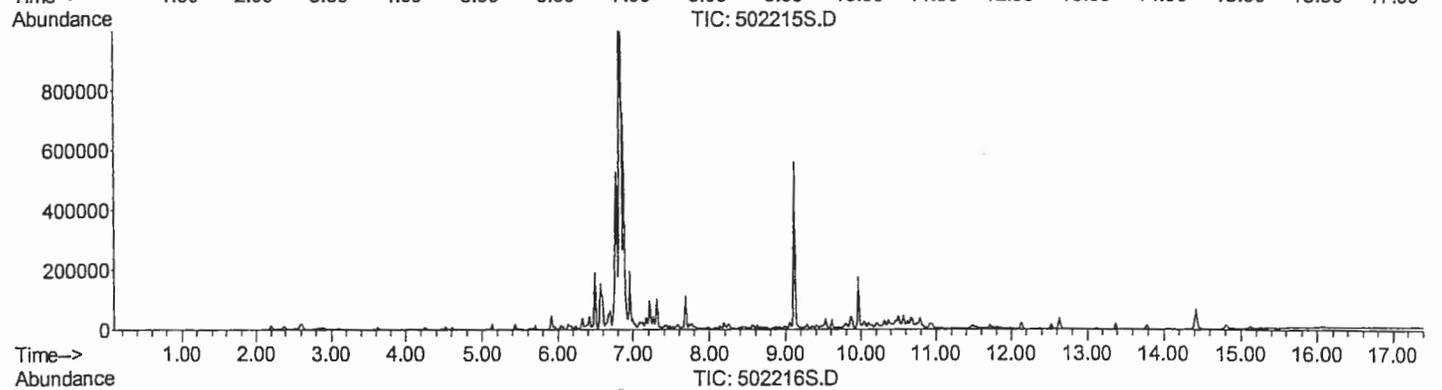
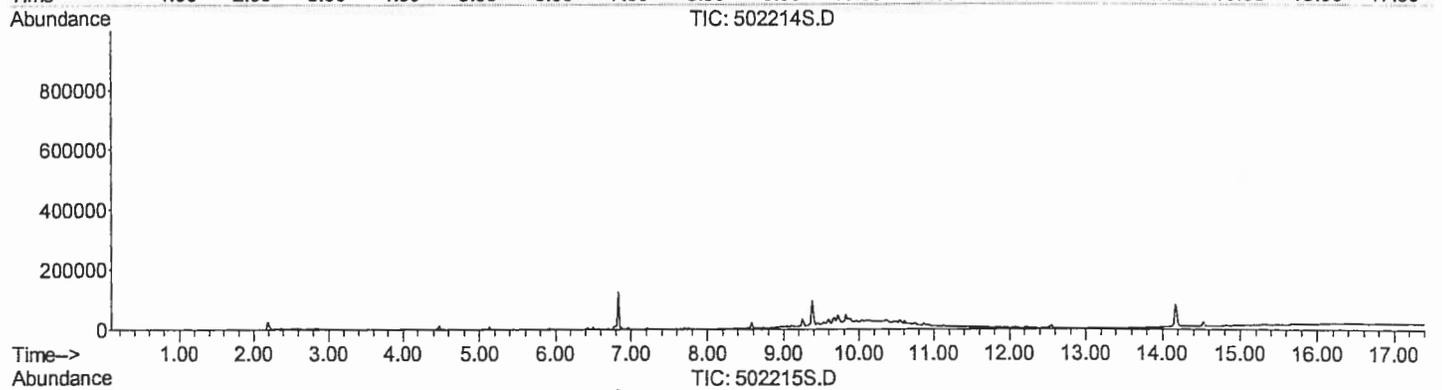
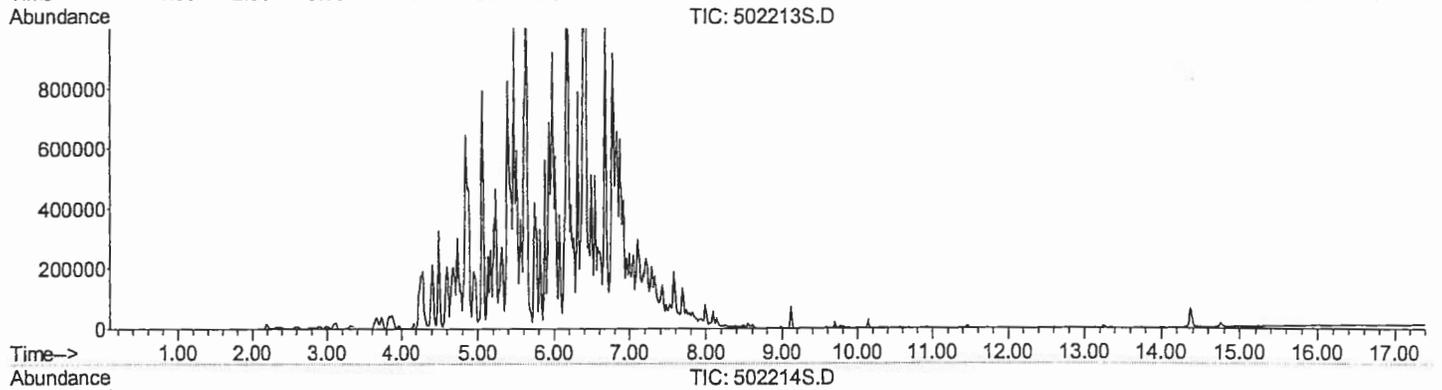
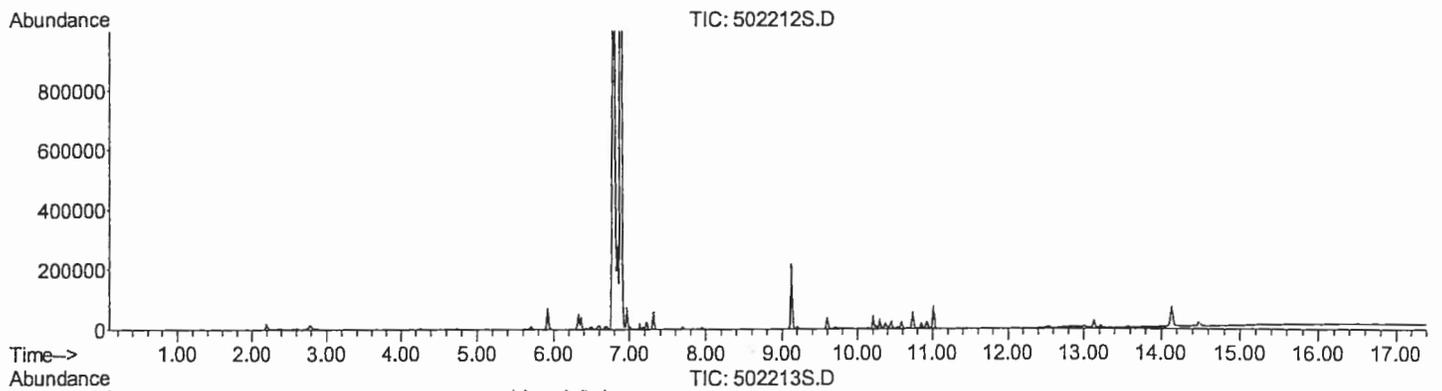
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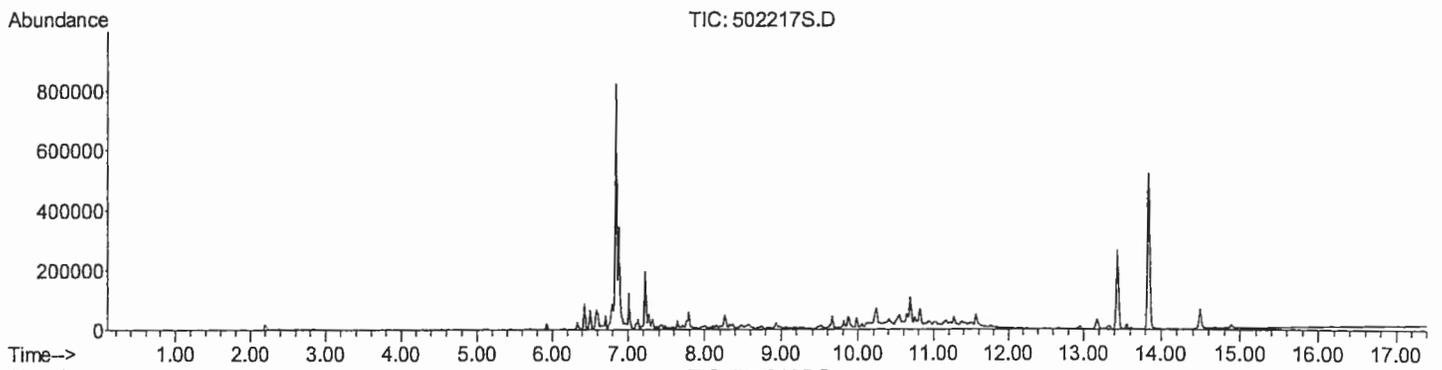


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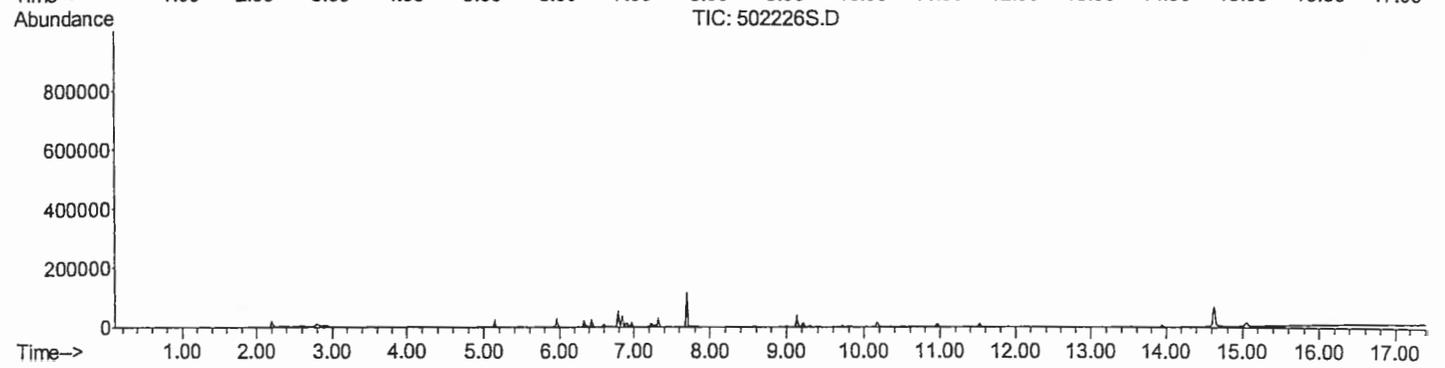
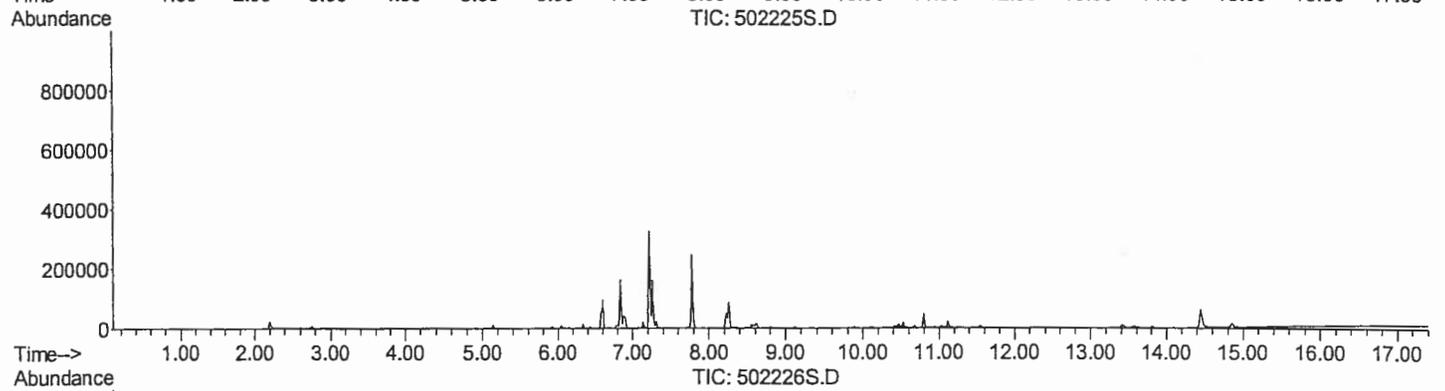
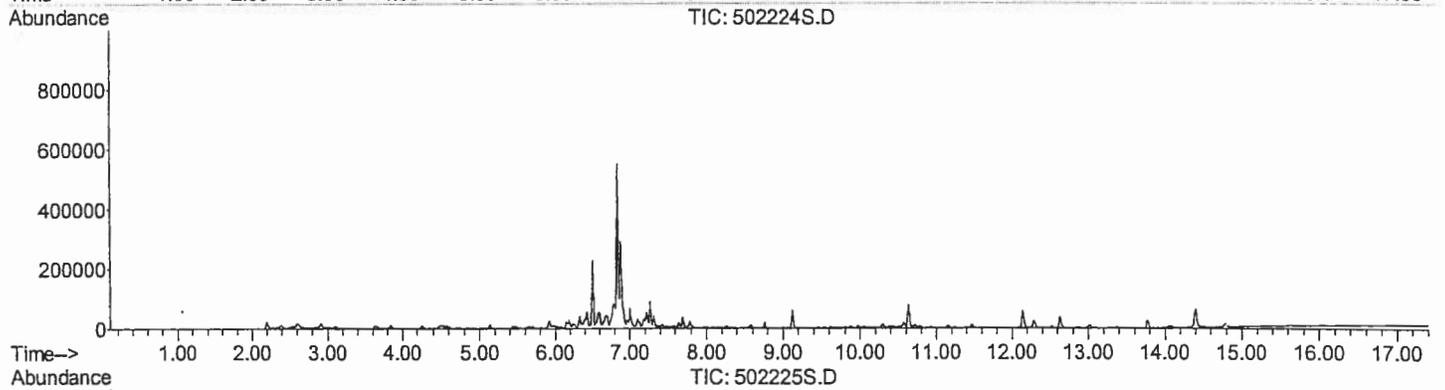
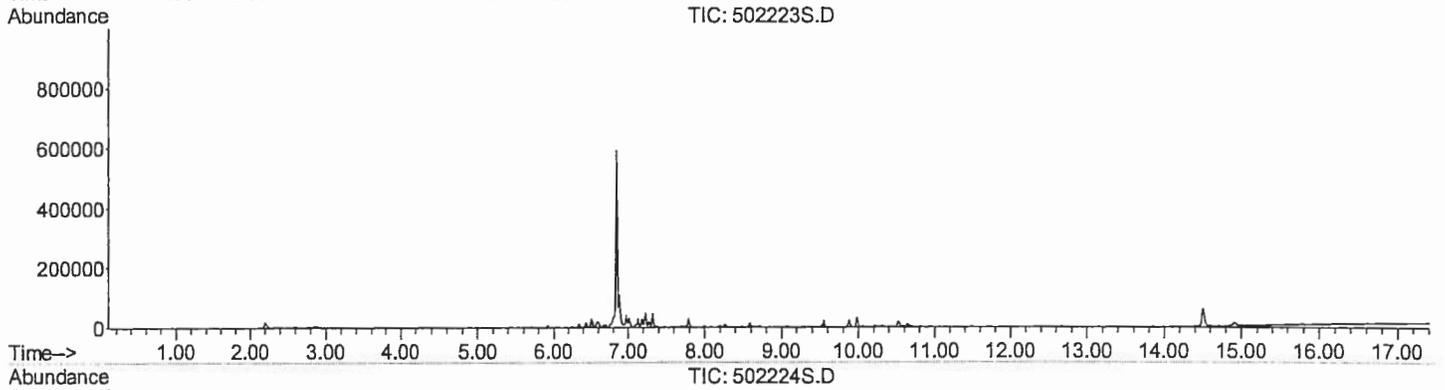
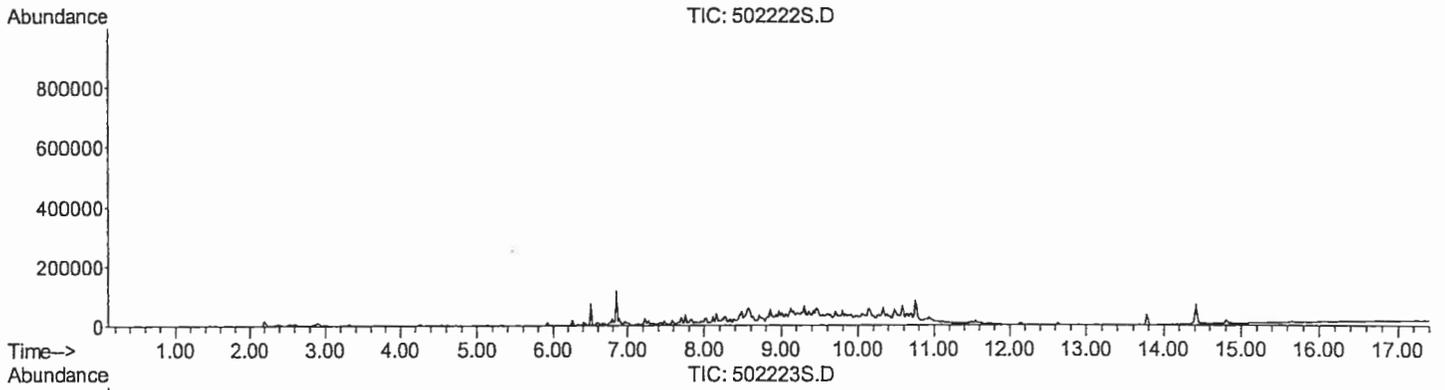
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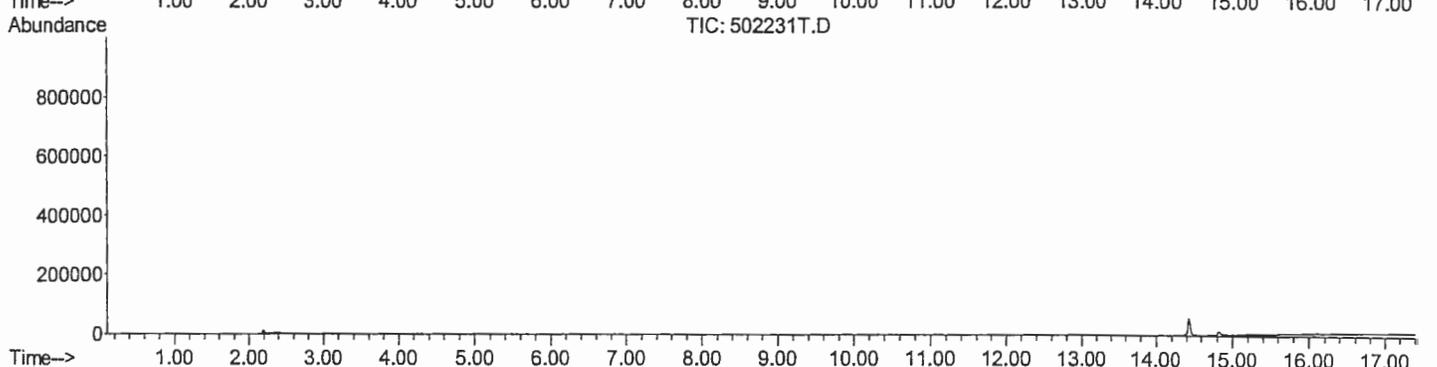
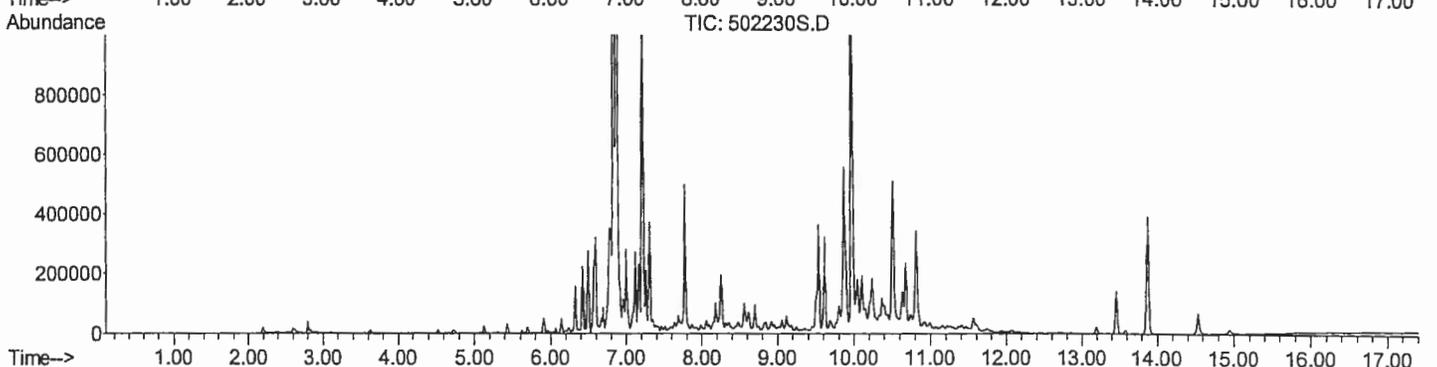
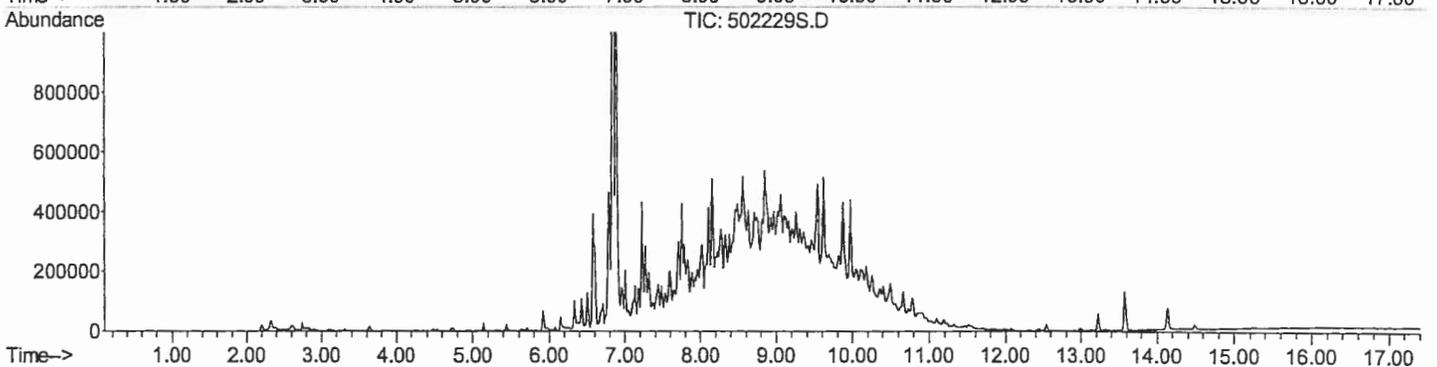
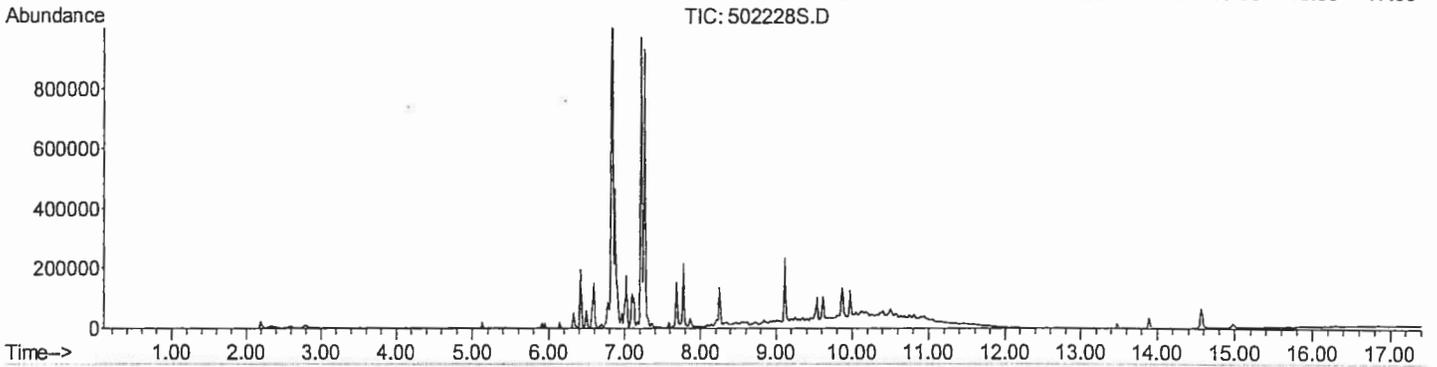
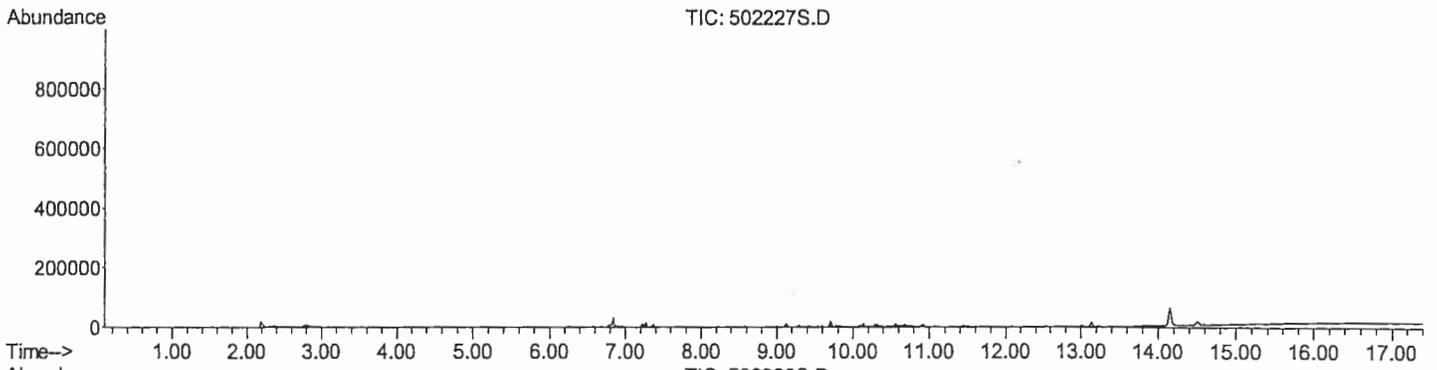


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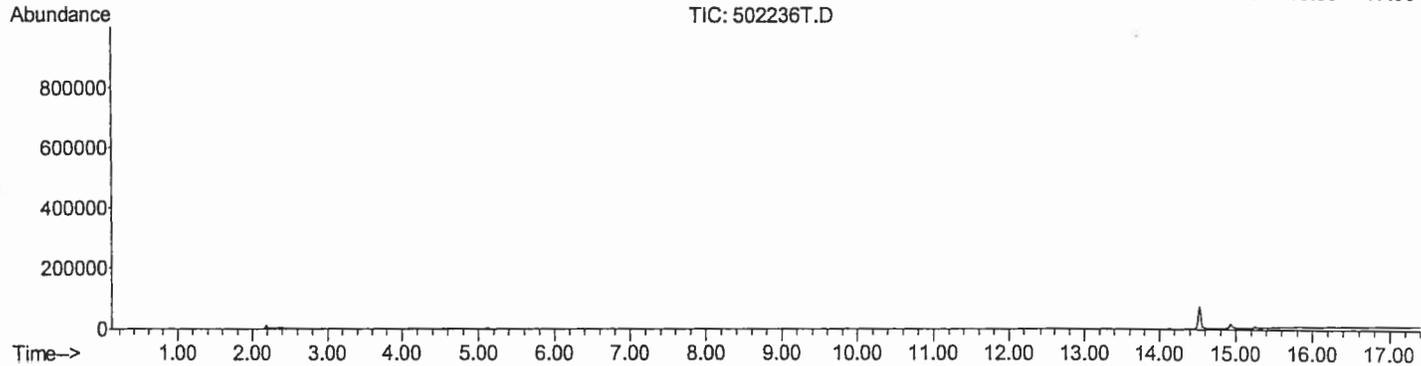
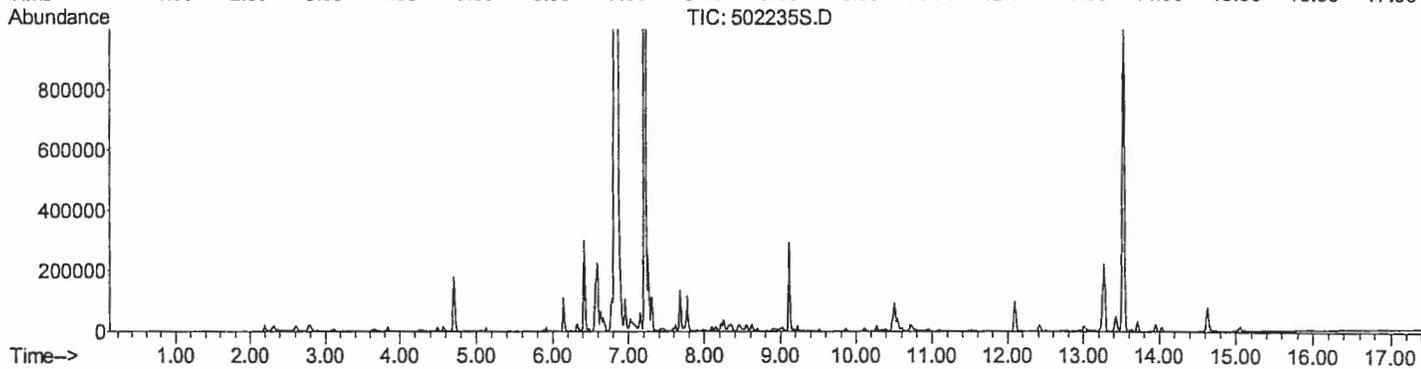
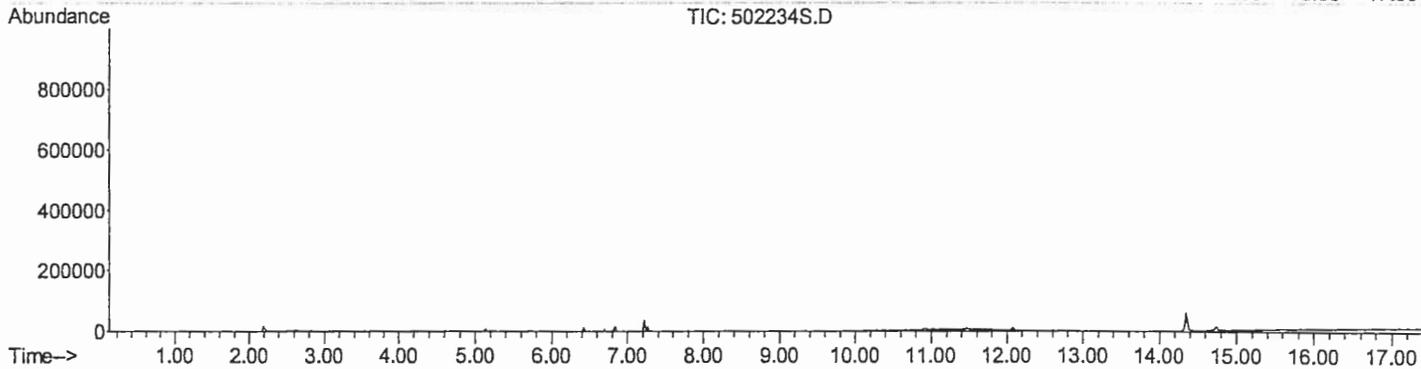
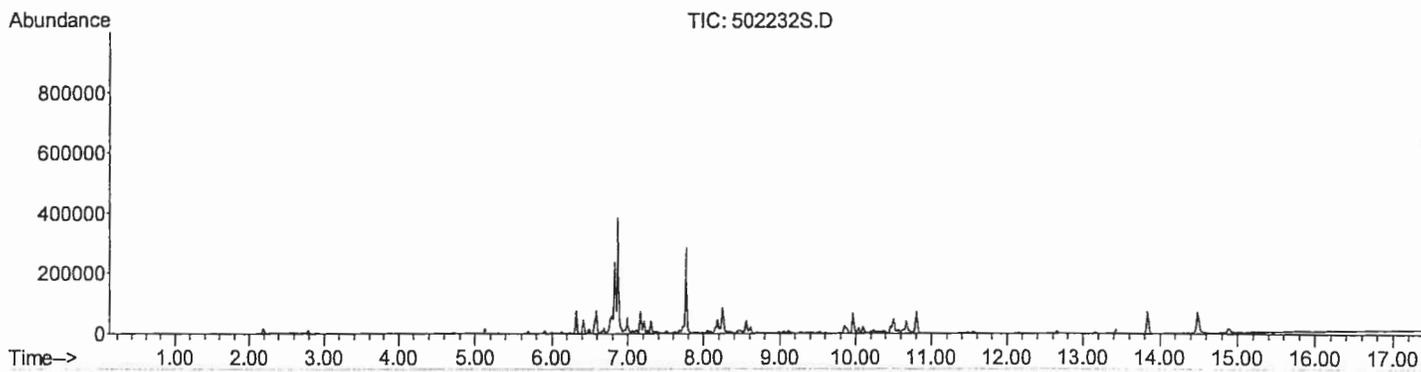
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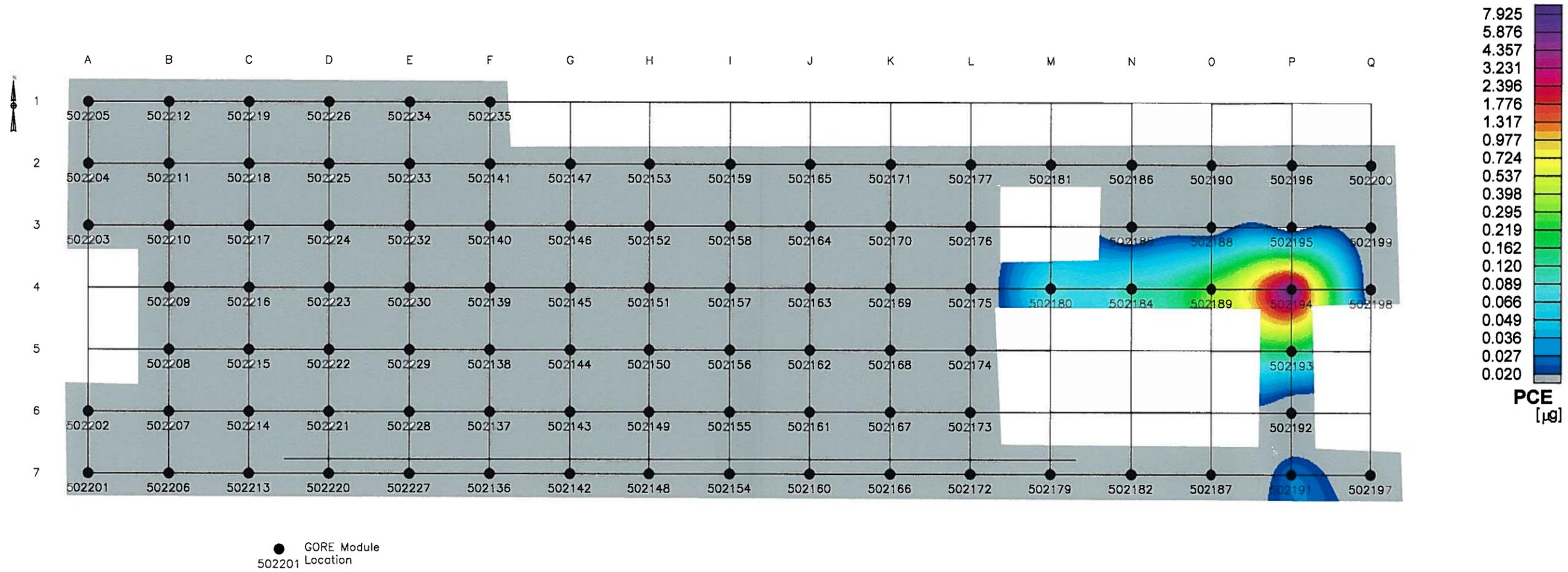


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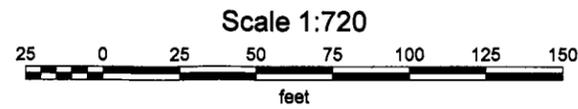


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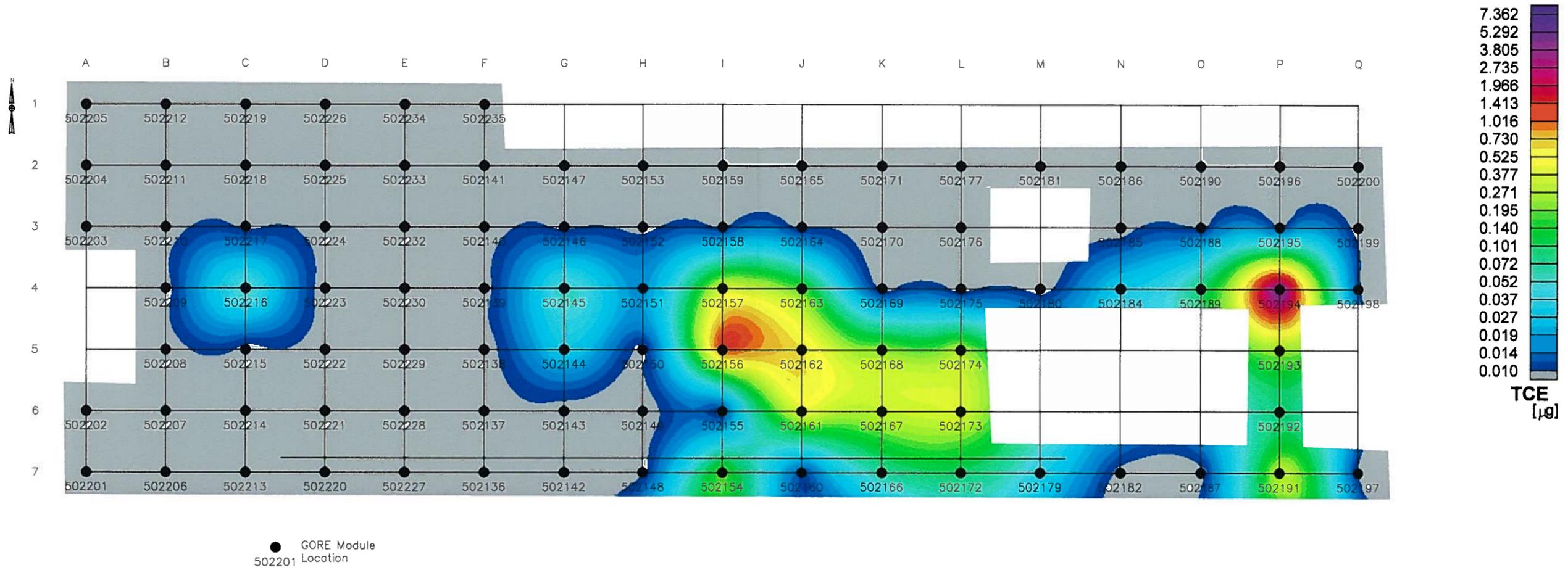


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 Tetrachloroethene

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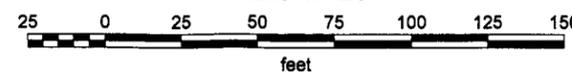


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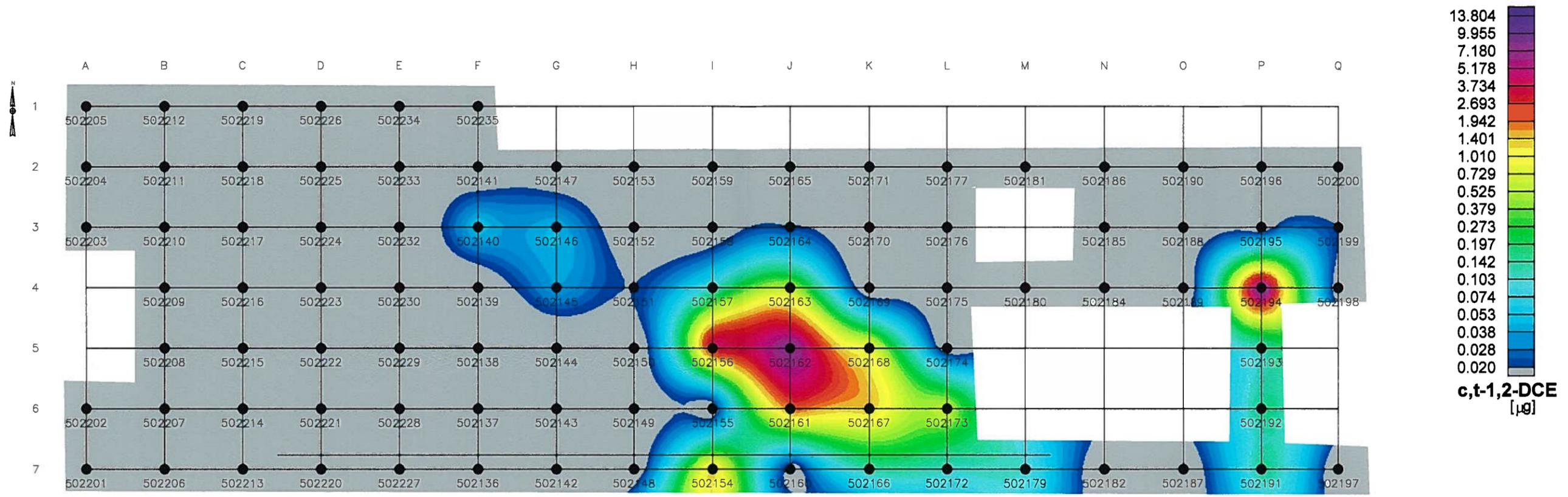
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Scale 1:720



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REV. DATE:	REV. #:	PROJECT NUMBER: 12792893	



● GORE Module Location
502201

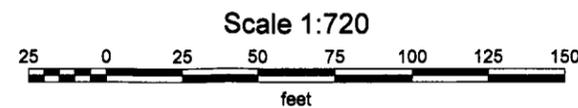
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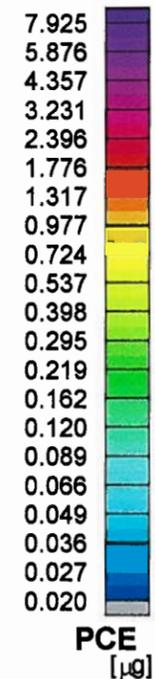
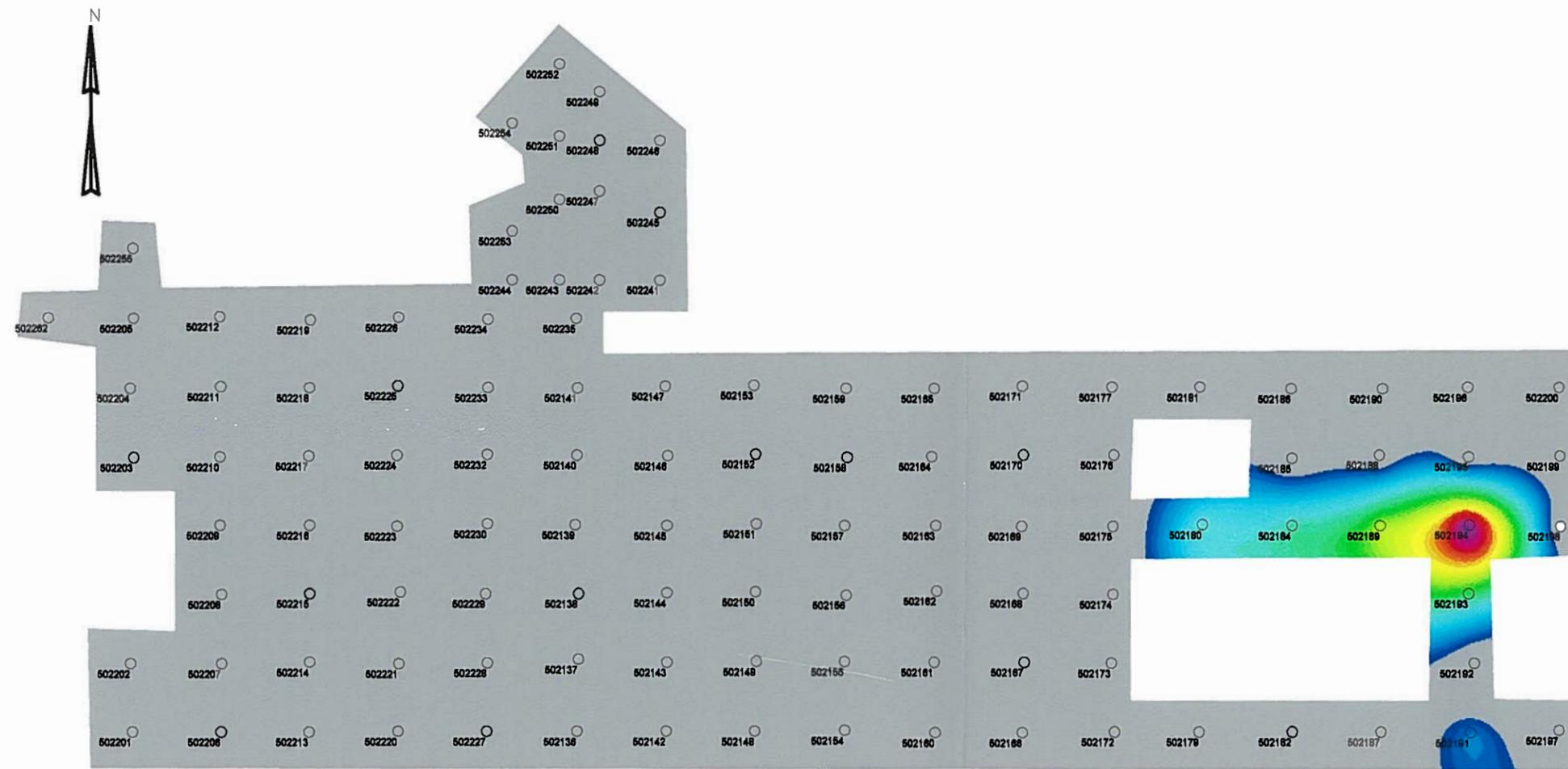
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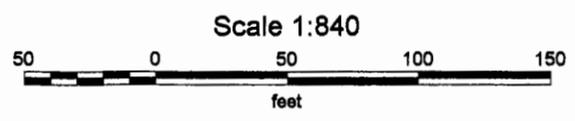
GORE(TM) Module Location
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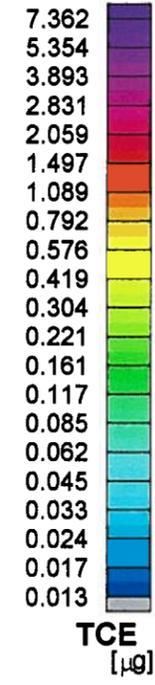
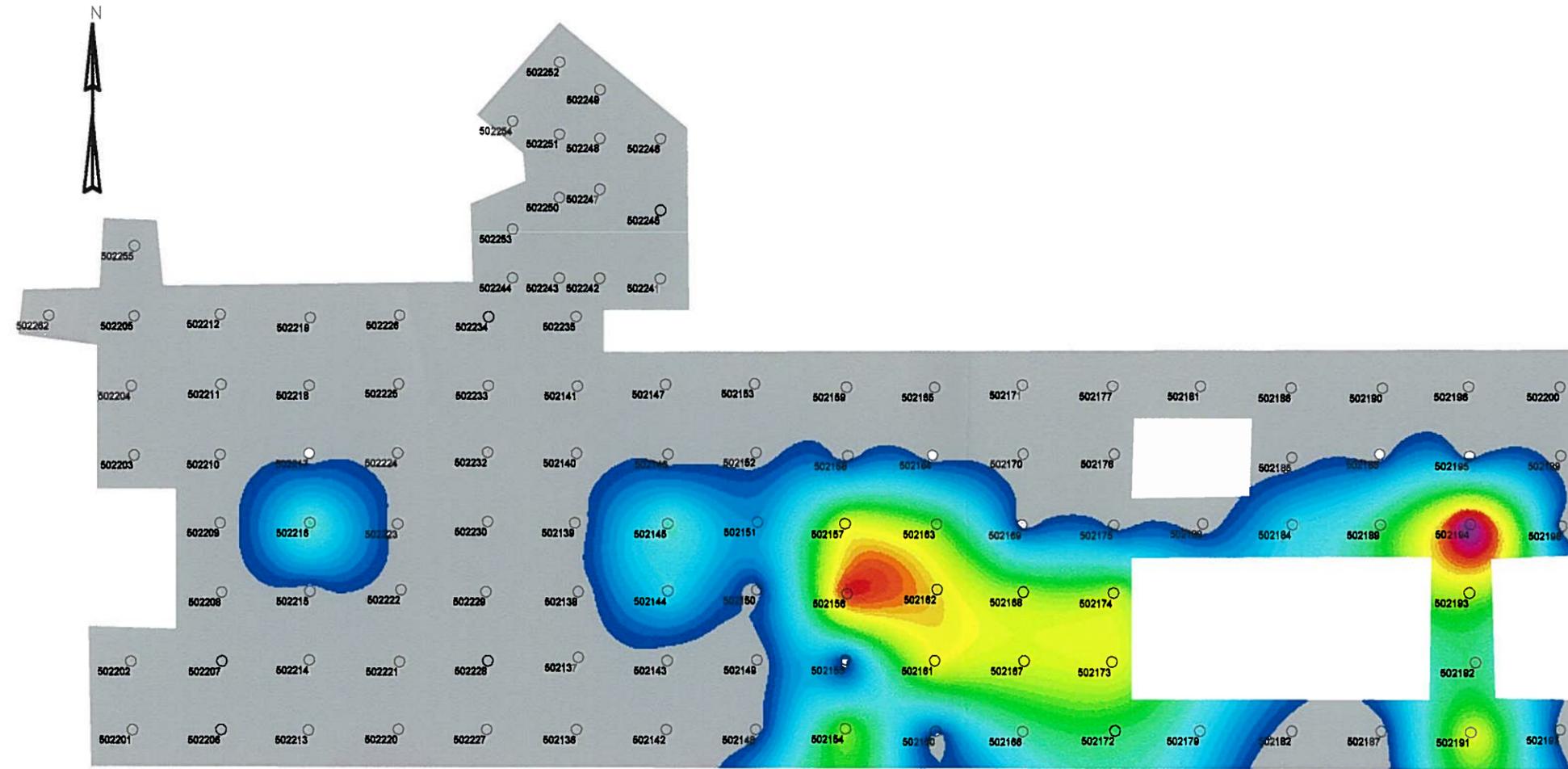
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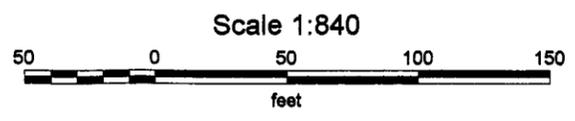
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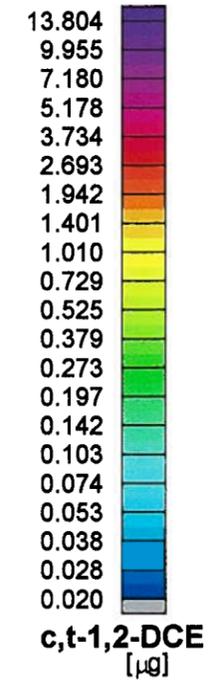
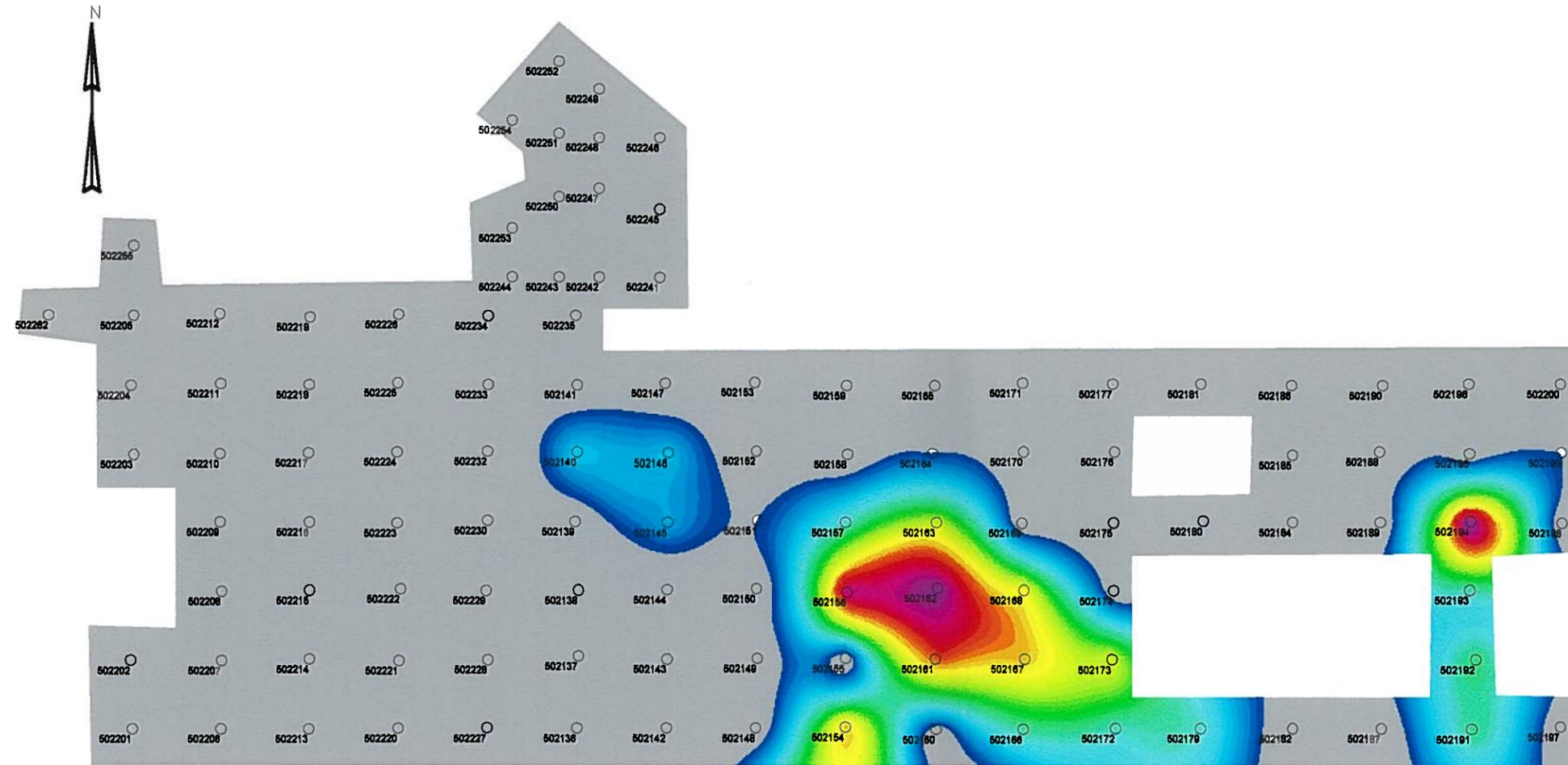
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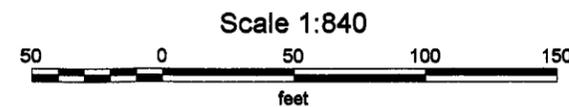
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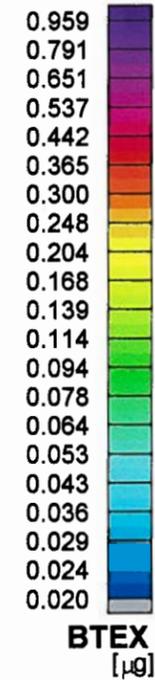
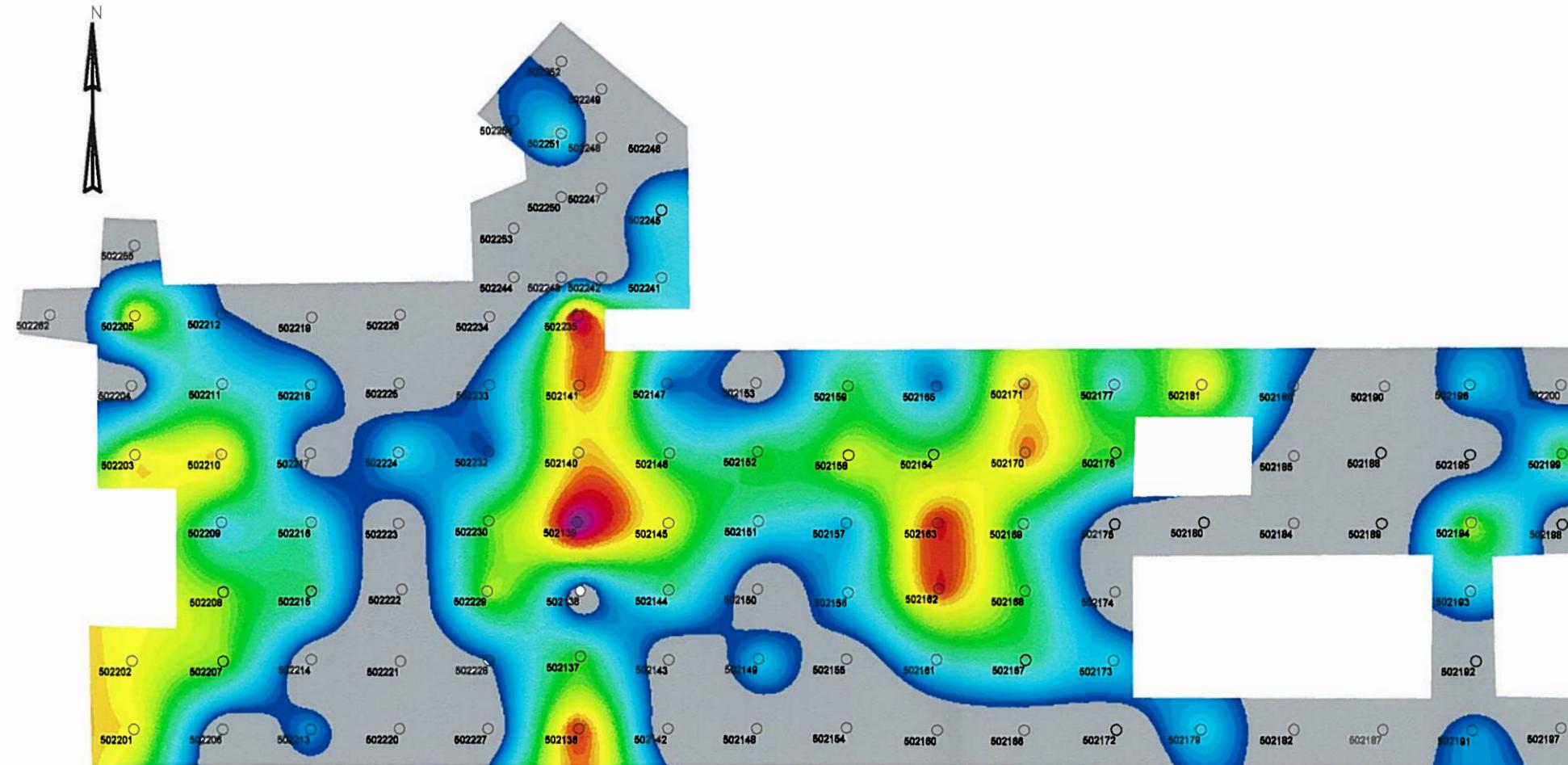
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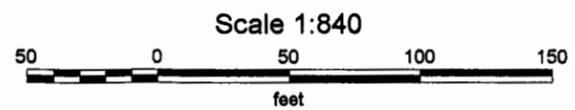
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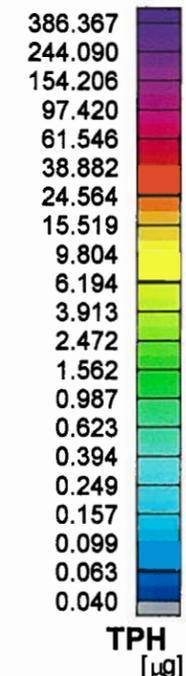
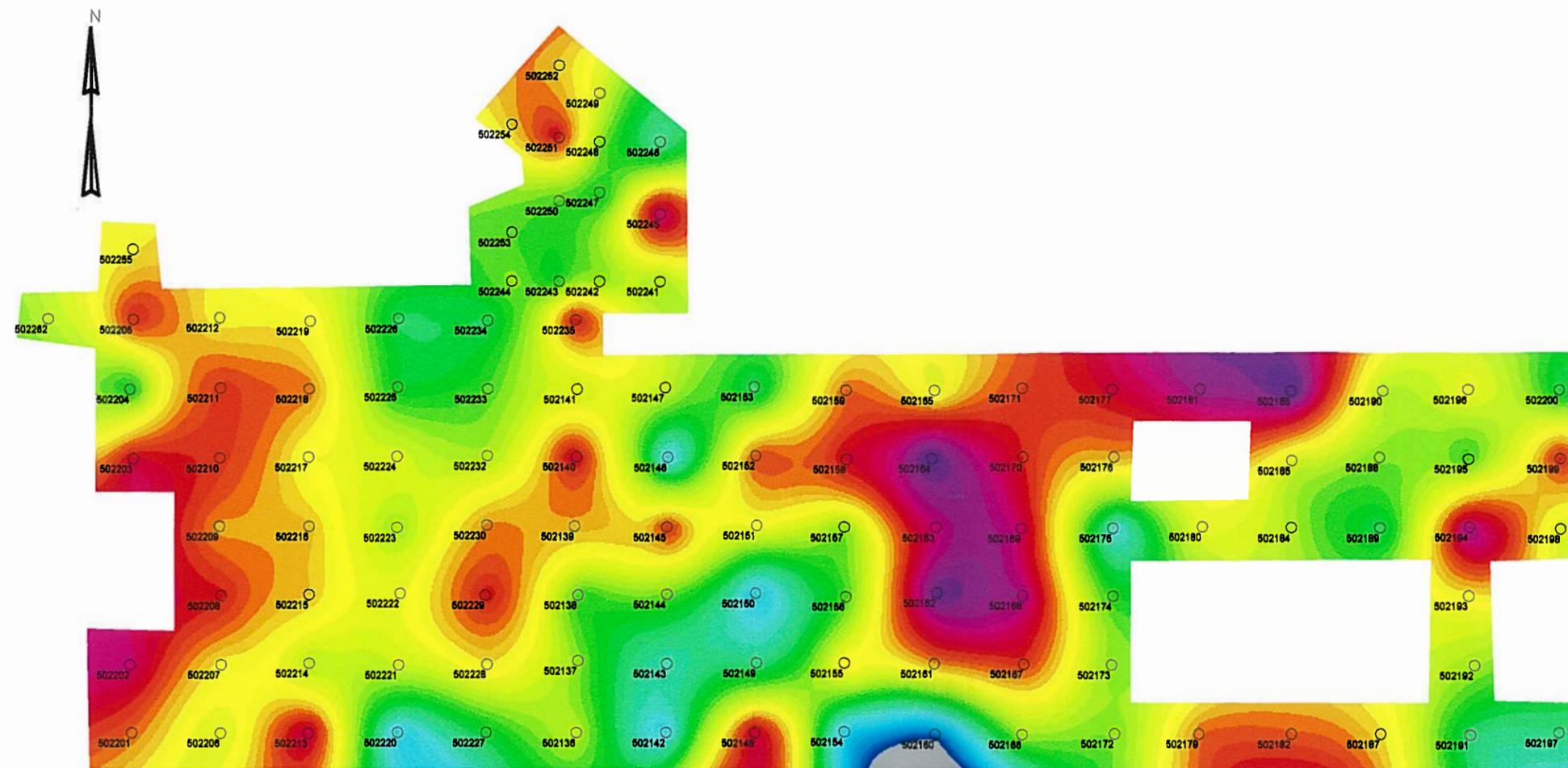
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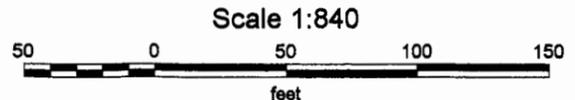
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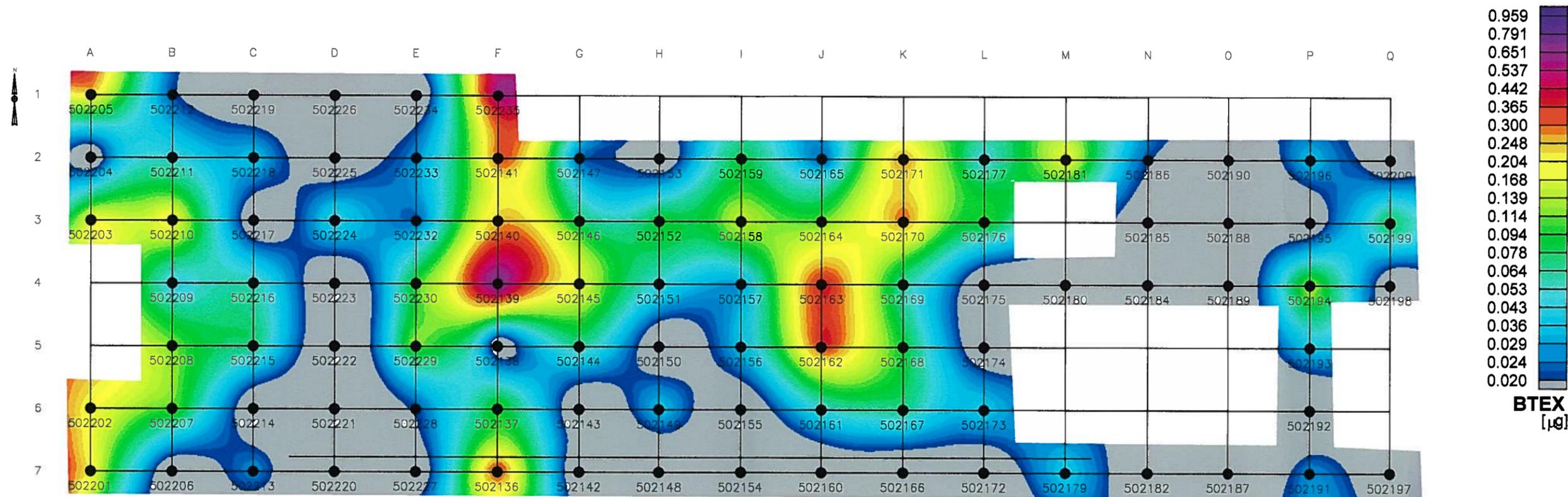
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REV. DATE:	REV. #:	PROJECT NUMBER: 12792893/ 12793188	



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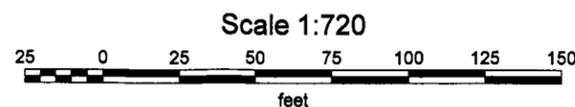


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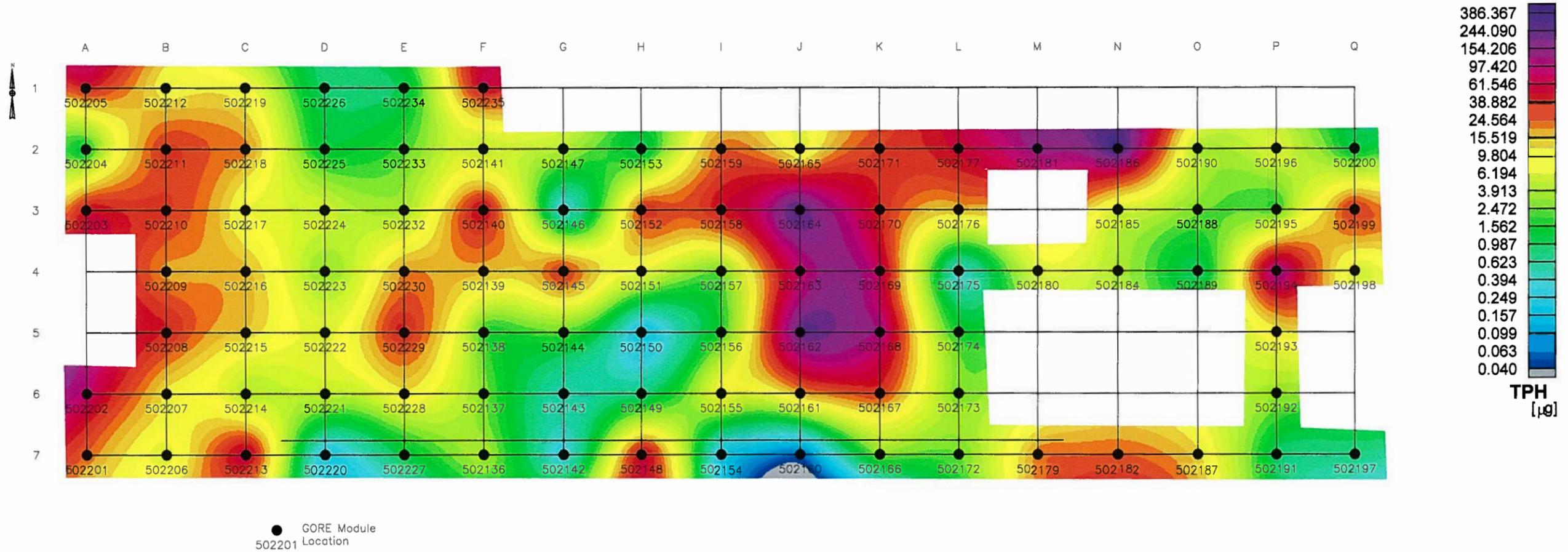
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BTEX

DATE DRAWN: 5 Sept 2006	DRAWN BY: JH	ORIG. CAD: 1831....dwg	SITE CODE: DKG
REV. DATE:	REV. #:	PROJECT NUMBER: 12792893	



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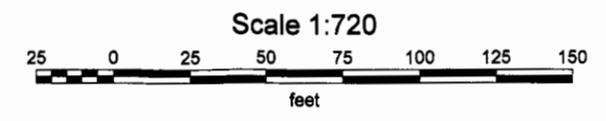
● GORE Module Location
502201

GORE™ Surveys for Environmental Site Assessment



W.L. GORE & ASSOCIATES, INC.
100 CHESAPEAKE BOULEVARD
ELKTON, MD, USA 21921
USA
(410) 382-7600

Tetra Tech NUS, Tallahassee, FL
Site 3/NCBC Gulfport
Total Petroleum Hydrocarbons



DATE DRAWN: 5 Sept 2006	DRAWN BY: JH	ORIG. CAD: 1831....dwg	SITE CODE: DKG
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W. L. GORE & ASSOCIATES, INC.

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GORE™ EXPLORATION SURVEY
GORE™ ENVIRONMENTAL SURVEY

GORE™ Surveys Final Report

Site 3/ NCBC
Gulfport, MS

November 10, 2006

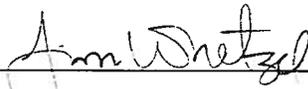
Prepared For:
Tetra Tech NUS
3360 Capital Circle NE
Suite B
Tallahassee, FL, 32308

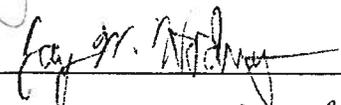
W.L. Gore & Associates, Inc.

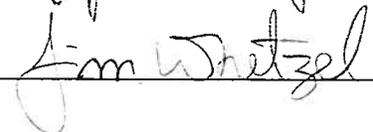
Written/Submitted by:
Jim E. Whetzel, Project Manager

Reviewed/Approved by:
Jay W. Hodny, Ph.D., Product Specialist

Analytical Data Reviewed by:
Jim E. Whetzel, Chemist







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GORE™ Surveys - Final Report

REPORT DATE: 11/10/2006

AUTHOR: JW

SITE INFORMATION

Site Reference: Site 3/ NCBC, Gulfport, MS

Gore Production Order Number: 12793188

Gore Site Code: DMI

FIELD PROCEDURES

Modules shipped: 22

Installation Date(s): 9/26/06

Modules Installed: 16

Field work performed by: Tetra Tech NUS

Retrieval date(s): 10/10/06

Exposure Time: 14 [days]

Modules Retrieved: 14

Trip Blanks Returned: 1

Modules Lost in Field: 2

Unused Modules Returned: 5

Date/Time Received by Gore: 10/11/2006 11:00 AM **By:** CW

Chain of Custody Form attached: Yes

Chain of Custody discrepancies: None

Comments:

Module 502268 was identified as a trip blank.

Modules 502252 and -253 were not retrieved and considered lost from the field.

Modules 502263 to 502267 were returned unused.

GORE™ Surveys - Final Report

ANALYTICAL PROCEDURES

W.L. Gore & Associates' Screening Module Laboratory operates under the guidelines of its Quality Assurance Manual, Operating Procedures and Methods. The quality assurance program is consistent with Good Laboratory Practices (GLP) and ISO Guide 25, "General Requirements for the Competence of Calibration and Testing Laboratories", third edition, 1990.

Instrumentation consists of state of the art gas chromatographs equipped with mass selective detectors, coupled with automated thermal desorption units. Sample preparation simply involves cutting the tip off the bottom of the sample module and transferring one or more exposed sorbent containers (sorbents, each containing engineered adsorbents) to a thermal desorption tube for analysis. Sorbents remain clean and protected from dirt, soil, and ground water by the insertion/retrieval cord, and require no further sample preparation.

Analytical Method Quality Assurance:

The analytical method employed is a modified EPA method 8260/8270. Before each run sequence, two instrument blanks, a sorber containing 5µg BFB (Bromofluorobenzene), and a method blank are analyzed. The BFB mass spectra must meet the criteria set forth in the method before samples can be analyzed. A method blank and a sorber containing BFB are also analyzed after every 30 samples and/or trip blanks. Standards containing the selected target compounds at five calibration levels are analyzed at the beginning of each run. The criterion for each target compound is less than 25% RSD (relative standard deviation). If this criterion is not met for any target compound, the analyst has the option of generating second- or third-order standard curves, as appropriate. A second-source reference standard, at a level of 10µg per target compound, is analyzed after every ten samples and/or trip blanks, and at the end of the run sequence. Positive identification of target compounds is determined by 1) the presence of the target ion and at least two secondary ions; 2) retention time versus reference standard; and, 3) the analyst's judgment.

NOTE: All data have been archived. Any replicate sorbents not used in the initial analysis will be discarded fifteen (15) days from the date of analysis.

Laboratory analysis: thermal desorption, gas chromatography, mass selective detection

Instrument ID: # 3 **Chemist:** DC/JW

Compounds/mixtures requested: A1

Deviations from Standard Method: None

Comments: Soil vapor analytes and abbreviations are tabulated in the Data Table Key (page 6). Significant levels of terpenes were observed on the following modules: 502248, -249, -252, and -255. Significant levels of terpenes, which are typically naturally occurring, can contribute to reported TPH levels.

GORE™ Surveys - Final Report

DATA TABULATION

CONTOUR MAPS ENCLOSED: Five (5) B-sized color contour maps

LIST OF MAPS ENCLOSED:

- Tetrachloroethene (PCE)
- Trichloroethene (TCE)
- cis- & trans-1,2-Dichloroethene (c-, t-1-2-DCE)
- Benzene, Toluene, Ethyl benzene, and total Xylenes (BTEX)
- Total Petroleum Hydrocarbons (TPH)

NOTE: All data values presented in Appendix A represent masses of compound(s) desorbed from the GORE™ Modules received and analyzed by W.L. Gore & Associates, Inc., as identified in the Chain of Custody (Appendix A). The measurement traceability and instrument performance are reproducible and accurate for the measurement process documented. Semi-quantitation of the compound mass is based on a five-level standard calibration.

General Comments:

- This survey reports soil gas mass levels present in the vapor phase. Vapors are subject to a variety of attenuation factors during migration away from the source concentration to the module. Thus, mass levels reported from the module will often be less than concentrations reported in soil and groundwater matrix data. In most instances, the soil gas masses reported on the modules compare favorably with concentrations reported in the soil or groundwater (e.g., where soil gas levels are reported at greater levels relative to other sampled locations on the site, matrix data should reveal the same pattern, and vice versa). However, due to a variety of factors, a perfect comparison between matrix data and soil gas levels can rarely be achieved.
- Soil gas signals reported by this method cannot be identified specifically to soil adsorbed, groundwater, and/or free-product contamination. The soil gas signal reported from each module can evolve from all of these sources. Differentiation between soil and groundwater contamination can only be achieved with prior knowledge of the site history (i.e., the site is known to have groundwater contamination only).
- QA/QC trip blank modules were provided to document potential exposures that were not part of the soil gas signal of interest (i.e., impact during module shipment, installation and retrieval, and storage). The trip blanks are identically manufactured and packaged soil gas modules to those modules placed in the subsurface. However, the trip blanks remain unopened during all phases of the soil gas survey. Levels reported on the trip blanks may indicate potential impact to modules other than the contaminant source of interest.

GORE™ Surveys - Final Report

- Unresolved peak envelopes (UPEs) are represented as a series of compound peaks clustered together around a central gas chromatograph elution time in the total ion chromatogram. Typically, UPEs are indicative of complex fluid mixtures that are present in the subsurface. UPEs observed early in the chromatogram are considered to indicate the presence of more volatile fluids, while UPEs observed later in the chromatogram may indicate the presence of less volatile fluids. Multiple UPEs may indicate the presence of multiple complex fluids.
- Stacked total ion chromatograms (TICs) are included in Appendix A. The six-digit serial number of each module is incorporated into the TIC identification (e.g.: 123456S.D represents module #123456).

Project Specific Comments:

- The minimum (gray) contour level, for each mapped analyte or group of analytes, was set at the maximum blank level observed or the method detection limit, whichever was greater. When target compounds are summed together (i.e., BTEX), the contour minimum is arbitrarily set at 0.02 µg or the maximum blank level, whichever is greater. The maximum contour level was set at the maximum value observed.
- Background levels of TPH were detected on the trip blanks and/or the method blanks. No other target compounds were observed on the quality control blanks. Thus, target analyte levels reported for the field-installed modules that exceed trip and method blank levels, and the analyte method detection limit, are more likely to have originated from on-site sources.
- For mapping purposes, data was combined with data from a previous survey at the site. Data for the first survey was reported to Tetra Tech on September 6, 2006.
- The relatively high levels of terpenes found in modules 502248, -249, -252, and -255 contributed to the TPH values reported. However, the mapped spatial pattern of TPH distribution was not significantly impacted. Elevated levels of TPH were observed throughout the survey area with highest levels observed in the region that included modules 502162 and -164, and also modules 502181 and -186.
- Several “hot spots” and partial plume delineation was observed in the BTEX, and chlorinated solvent contour maps.
- If the objective of the soil gas survey was to delineate the nature and extent of the contamination, then additional soil gas sampling is recommended in those areas where the color contours appear to extend into unsampled areas. Subsequent sampling events can be combined with the data from this event and mapped together to provide greater coverage.

GORE™ Surveys - Final Report

KEY TO DATA TABLE Site 3/ NCBC, Gulport, MS

UNITS

µg	micrograms (per sorber), reported for compounds
MDL	method detection limit
bdl	below detection limit
nd	non-detect

ANALYTES

TPH	total petroleum hydrocarbons
BTEX	combined masses of benzene, toluene, ethylbenzene and total xylenes (Gasoline Range Aromatics)
BENZ	benzene
TOL	toluene
EtBENZ	ethylbenzene
mpXYL	m-, p-xylene
oXYL	o-xylene
C11,C13&C15	combined masses of undecane, tridecane, and pentadecane (C11+C13+C15) (Diesel Range Alkanes)
UNDEC	undecane
TRIDEC	tridecane
PENTADEC	pentadecane
TMBs	combined masses of 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene
135TMB	1,3,5-trimethylbenzene
124TMB	1,2,4-trimethylbenzene
ct12DCE	cis- & trans-1,2-dichloroethene
t12DCE	trans-1,2-dichloroethene
c12DCE	cis-1,2-dichloroethene
NAPH&2-MN	combined masses of naphthalene and 2-methyl naphthalene
NAPH	naphthalene
2MeNAPH	2-methyl naphthalene
MTBE	methyl t-butyl ether
11DCA	1,1-dichloroethane
CHCl ₃	chloroform
111TCA	1,1,1-trichloroethane
12DCA	1,2-dichloroethane
CCl ₄	carbon tetrachloride
TCE	trichloroethene
OCT	octane
PCE	tetrachloroethene
CIBENZ	chlorobenzene
14DCB	1,4-dichlorobenzene
112TCA	1,1,2-trichloroethane
1112TetCA	1,1,1,2-tetrachloroethane
1122TetCA	1,1,2,2-tetrachloroethane
13DCB	1,3-dichlorobenzene
12DCB	1,2-dichlorobenzene

BLANKS

TBn	unexposed trip blanks, travels with the exposed modules
method blank	QA/QC module, documents analytical conditions during analysis

APPENDIX A:

1. CHAIN OF CUSTODY
2. DATA TABLE
3. STACKED TOTAL ION CHROMATOGRAMS
4. COLOR CONTOUR MAPS

GORE-SORBER® Screening Survey Chain of Custody

For W.L. Gore & Associates use only
Production Order # 12793188



W. L. Gore & Associates, Inc., Survey Products Group

100 Chesapeake Boulevard • Elkton, Maryland 21921 • Tel: (410) 392-7600 • Fax (410) 506-4780

-210

Instructions: Customer must complete ALL shaded cells

Customer Name: <u>TETRA TECH NUS</u>		Site Name: <u>NCBC NAVY</u>			
Address: <u>FOSTER PLAZA VII 661 ANDERSON DR</u> <u>PITTSBURGH PA</u> <u>USA</u>		Site Address: <u>GULFPORT MS</u>			
Phone: <u>850 559 1692</u>		Project Manager: <u>ROBERT FISHER</u>			
FAX: _____		Customer Project No.: _____			
		Customer P.O. #: <u>1009777</u> Quote #: _____			
Serial # of Modules Shipped		# of Modules for Installation <u>20</u> # of Trip Blanks <u>2</u>			
# 502241 - # 502255	# - #	Total Modules Shipped: <u>22</u> Pieces			
# 502262 - # 502268	# - #	Total Modules Received: <u>22</u> Pieces			
# - #	# - #	Total Modules Installed: <u>16</u> Pieces			
# - #	# - #	Serial # of Trip Blanks (Client Decides) # <u>502268</u>			
# - #	# - #	#	#		
# - #	# - #	#	#		
# - #	# - #	#	#		
# - #	# - #	#	#		
# - #	# - #	#	#		
# - #	# - #	#	#		
# - #	# - #	#	#		
Prepared By: <u>W. L. Gore yellowcl</u>	#	#	#		
Verified By: <u>Clarence W. H.</u>	#	#	#		
Installation Performed By:		Installation Method(s) (circle those that apply):			
Name (please print): <u>Jason Bourgeois</u>		Slide Hammer Hammer Drill <u>Auger</u>			
Company/Affiliation: <u>T+NUS</u>		Other: _____			
Installation Start Date and Time: <u>09/26/06</u> <u>15:30</u> AM <u>PM</u>					
Installation Complete Date and Time: <u>09/26/06</u> <u>16:00</u> AM <u>PM</u>					
Retrieval Performed By:		Total Modules Retrieved: <u>14</u> Pieces			
Name (please print): <u>Jason Bourgeois</u>		Total Modules Lost in Field: <u>2</u> Pieces			
Company/Affiliation: <u>1</u>		Total Unused Modules Returned: <u>5</u> Pieces			
Retrieval Start Date and Time: <u>10/10/06</u> <u>14:45</u> AM <u>PM</u>					
Retrieval Complete Date and Time: <u>10/10/06</u> <u>15:28</u> AM <u>PM</u>					
Relinquished By: <u>W. L. Gore yellowcl</u>	Date	Time	Received By: _____	Date	Time
Affiliation: <u>W.L. Gore & Associates, Inc.</u>	<u>7/6/06</u>	<u>9:30</u>	Affiliation: <u>T+NUS</u>		
Relinquished By: _____	Date	Time	Received By: _____	Date	Time
Affiliation: <u>T+NUS</u>	<u>10/10/06</u>	<u>19:00</u>	Affiliation: _____		
Relinquished By: _____	Date	Time	Received By: <u>Clarence W. H.</u>	Date	Time
Affiliation: _____			Affiliation: <u>W.L. Gore & Associates, Inc.</u>	<u>10/11/06</u>	<u>11:00</u>

GORE-SORBER® Screening Survey
Installation and Retrieval Log

SITE NAME & LOCATION

Site 3, NCBC Gulfport
Gulfport, MS

Page 1 of 1

LINE #	MODULE #	INSTALLATION DATE/TIME	RETRIEVAL DATE/TIME	EVIDENCE OF LIQUID HYDROCARBONS (LPH) or HYDROCARBON ODOR (Check as appropriate)			MODULE IN WATER (check one)		COMMENTS
				LPH	ODOR	NONE	YES	NO	
1.	502241	9/26/06 1530	10/10/06 1445			X		X	
2.	502242	9/26/06 1532	10/10/06 1448			X		X	
3.	502243	9/26/06 1534	10/10/06 1453			X		X	
4.	502244	9/26/06 1536	10/10/06 1458			X		X	
5.	502245	9/26/06 1538	10/10/06 1459			X		X	
6.	502246	9/26/06 1541	10/10/06 1503			X		X	
7.	502247	9/26/06 1542	10/10/06 1505			X		X	
8.	502248	9/26/06 1544	10/10/06 1509			X		X	
9.	502249	9/26/06 1546	10/10/06 1511			X		X	
10.	502250	9/26/06 1548	10/10/06 1513			X		X	
11.	502251	9/26/06 1550	10/10/06 1515			X		X	
12.	502252	9/26/06 1552	10/10/06			X			destroyed (missing)
13.	502253	9/26/06 1554	10/10/06			X			destroyed (missing)
14.	502254	9/26/06 1556	10/10/06 1520			X		X	
15.	502255	9/26/06 1558	10/10/06 1524			X		X	
16.	502262	9/26/06 1600	10/10/06 1528			X	X		
17.	502263								not used
18.	502264								"
19.	502265								"
20.	502266								"
21.	502267								"
22.	502268								Trip Blanks
23.									
24.									
25.									
26.									
27.									
28.									
29.									
30.									
31.									
32.									
33.									
34.									
35.									
36.									
37.									
38.									
39.									
40.									
41.									
42.									

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRA TECH NUS, PITTSBURGH, PA
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE 3, NCBC GULFPORT, GULFPORT, MS
SITE DMI - PRODUCTION ORDER #12793188

DATE ANALYZED	SAMPLE NAME	TPH, ug	BTEX, ug	BENZ, ug	TOL, ug	EtBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug
	MDL=			0.01	0.01	0.01	0.01	0.01		0.01
10-12-06	502241	2.95	0.04	0.02	0.01	nd	0.01	nd	0.05	0.03
10-12-06	502242	2.48	nd	nd	nd	nd	nd	nd	0.04	0.03
10-11-06	502243	1.43	nd	nd	nd	nd	nd	nd	0.04	0.03
10-12-06	502244	2.97	nd	nd	nd	nd	nd	nd	0.07	0.04
10-11-06	502245	100.50	0.05	0.02	0.02	nd	0.01	nd	0.05	0.03
10-11-06	502246	0.57	nd	nd	nd	nd	nd	nd	0.03	0.02
10-11-06	502247	1.15	nd	nd	nd	nd	nd	nd	0.07	0.04
10-11-06	502248	2.34	nd	nd	nd	nd	nd	nd	0.06	0.05
10-12-06	502249	5.23	nd	nd	nd	nd	nd	nd	0.04	0.03
10-12-06	502250	1.83	nd	nd	nd	nd	nd	nd	0.05	0.04
10-11-06	502251	55.78	0.06	nd	0.05	nd	0.02	bdl	0.09	0.04
10-11-06	502252	14.48	0.02	nd	0.02	nd	nd	nd	0.08	0.07
10-11-06	502255	11.74	nd	nd	nd	nd	nd	nd	0.07	0.06
10-11-06	502262	3.81	0.00	bdl	nd	nd	bdl	nd	0.09	0.05
10-12-06	502268	0.02	nd	nd	nd	nd	nd	nd	nd	nd
10-11-06	method blank	0.01	nd	nd	nd	nd	nd	nd	nd	nd
	Maximum	100.50	0.06	0.02	0.05	0.00	0.02	0.01	0.09	0.07
	Standard Dev.	28.51	0.02	0.01	0.01	0.00	0.01	0.00	0.02	0.01
	Mean	14.80	0.01	0.00	0.01	0.00	0.00	0.00	0.06	0.04

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRA TECH NUS, PITTSBURGH, PA
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE 3, NCBC GULFPORT, GULFPORT, MS
SITE DMI - PRODUCTION ORDER #12793188

SAMPLE NAME	TRIDEC, ug	PENTADEC, ug	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug
MDL=	0.01	0.01		0.01	0.01		0.02	0.02	
502241	0.01	0.01	nd	nd	nd	nd	nd	nd	nd
502242	0.01	bdl	nd	nd	nd	nd	nd	nd	nd
502243	0.01	bdl	nd	nd	nd	nd	nd	nd	nd
502244	0.03	0.01	0.00	bdl	nd	nd	nd	nd	nd
502245	0.02	nd	nd	nd	nd	nd	nd	nd	nd
502246	0.01	bdl	nd	nd	nd	nd	nd	nd	nd
502247	0.03	bdl	nd	nd	nd	nd	nd	nd	nd
502248	0.01	bdl	0.00	bdl	nd	nd	nd	nd	nd
502249	0.01	nd	nd	nd	nd	nd	nd	nd	nd
502250	0.02	bdl	nd	nd	nd	nd	nd	nd	nd
502251	0.03	0.02	0.04	0.02	0.01	nd	nd	nd	0.00
502252	0.02	bdl	nd	nd	nd	nd	nd	nd	nd
502255	0.02	bdl	nd	nd	nd	nd	nd	nd	0.00
502262	0.02	0.01	0.01	0.01	bdl	nd	nd	nd	0.01
502268	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd
Maximum	0.03	0.02	0.04	0.02	0.01	0.00	0.00	0.00	0.01
Standard Dev.	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
Mean	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRA TECH NUS, PITTSBURGH, PA
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE 3, NCBC GULFPORT, GULFPORT, MS
SITE DMI - PRODUCTION ORDER #12793188

SAMPLE NAME	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCE, ug	11DCA, ug	111TCA, ug	12DCA, ug	TCE, ug	OCT, ug	PCE, ug	14DCB, ug
MDL=	0.02	0.01	0.02	0.02	0.05	0.02	0.01	0.01	0.01	0.02	0.01
502241	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502242	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502243	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502244	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502245	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502246	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502247	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502248	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502249	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd
502250	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502251	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl
502252	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502255	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
502262	bdl	0.01	nd	nd	nd	nd	nd	nd	bdl	nd	bdl
502268	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Maximum	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
Standard Dev.	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

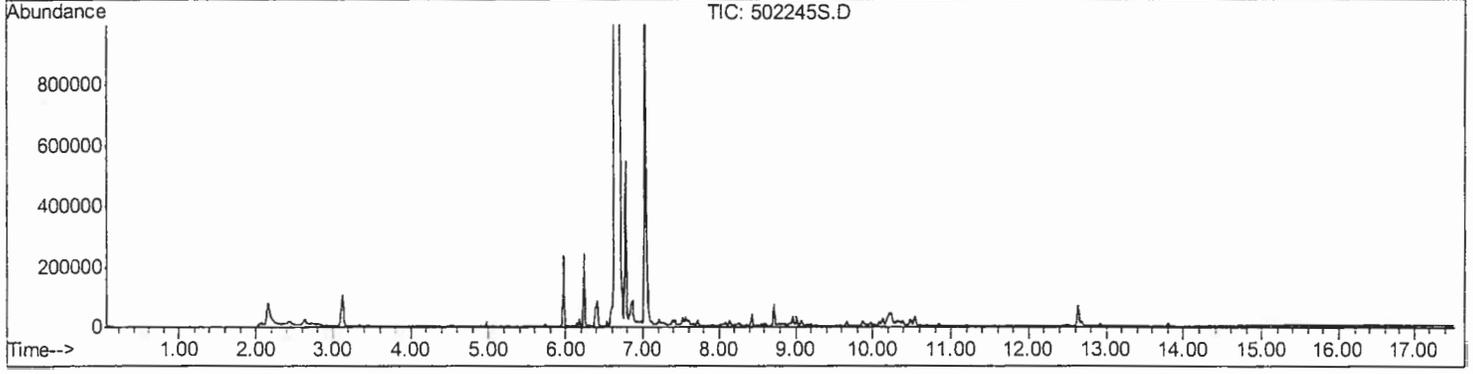
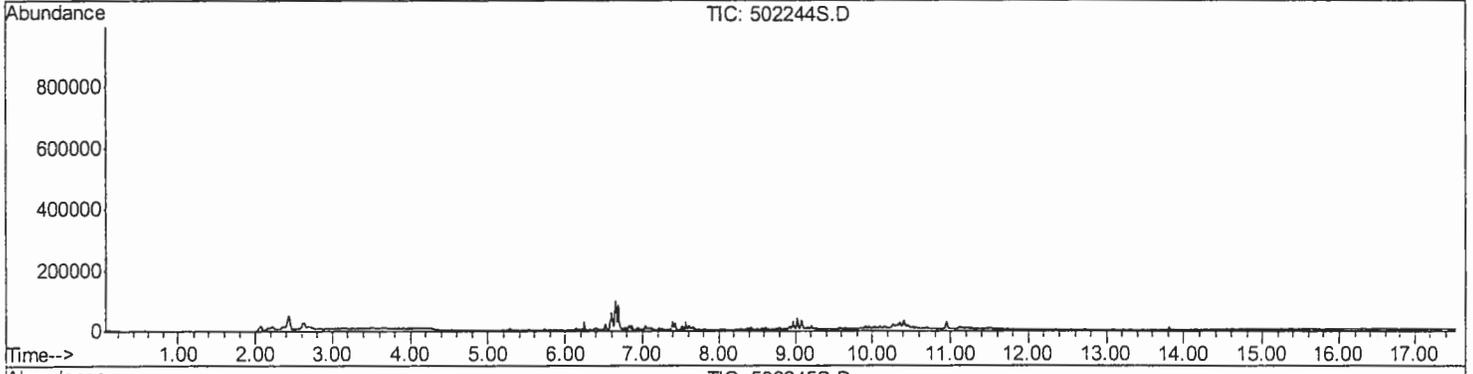
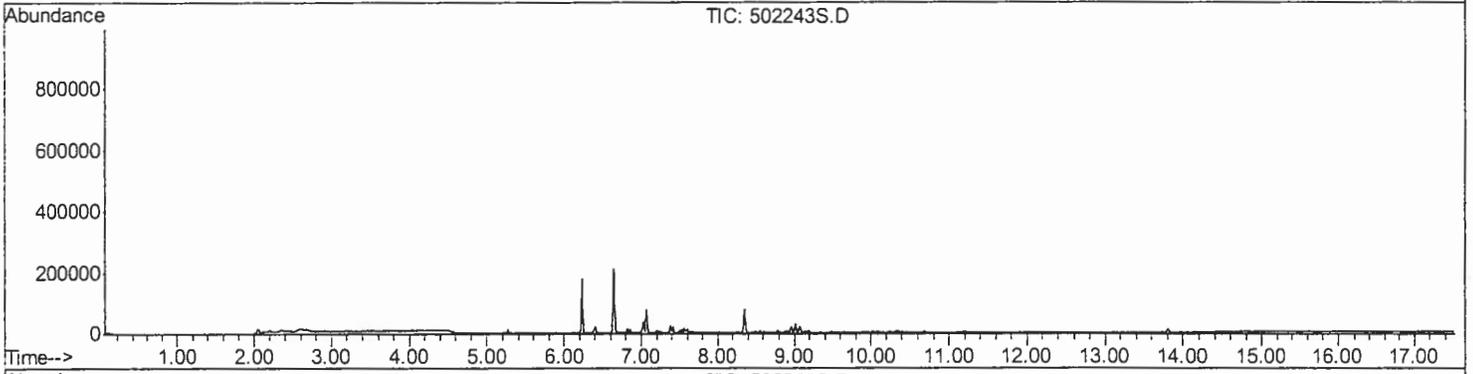
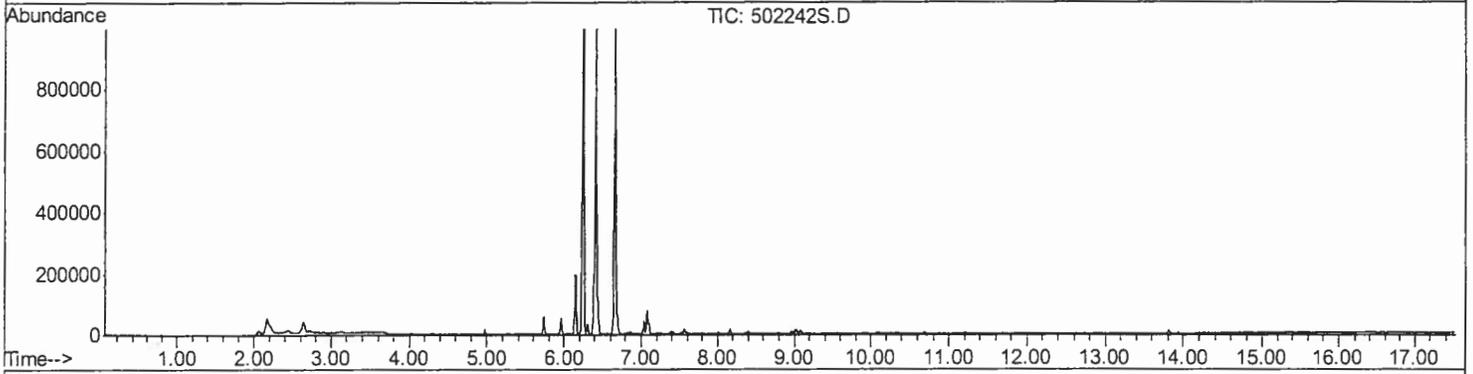
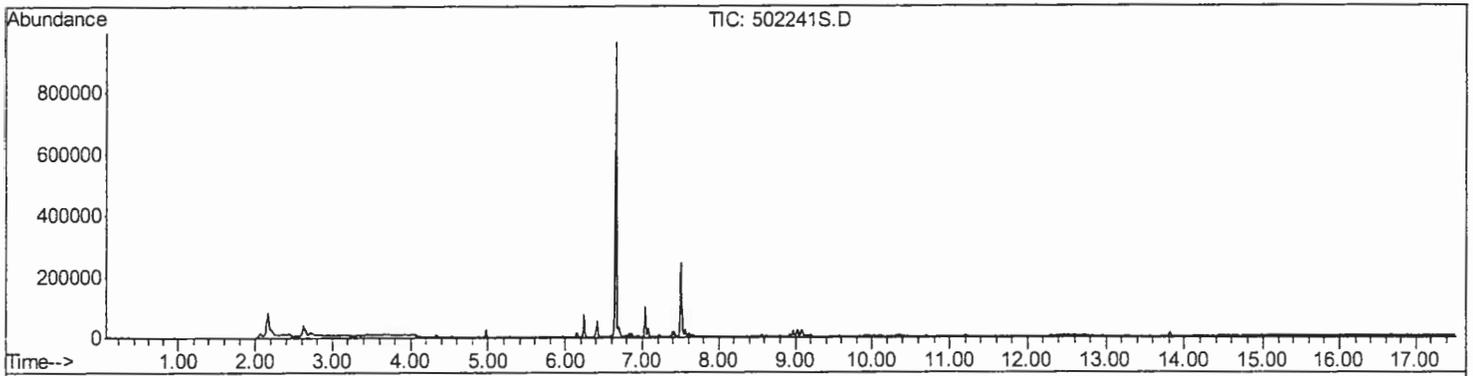
No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
TETRA TECH NUS, PITTSBURGH, PA
GORE STANDARD TARGET VOCs/SVOCs (A1)
SITE 3, NCBC GULFPORT, GULFPORT, MS
SITE DMI - PRODUCTION ORDER #12793188

SAMPLE NAME	CHCl3, ug	CCl4, ug	112TCA, ug	CIBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
MDL=	0.05	0.05	0.05	0.01	0.01	0.05	0.01	0.05
502241	nd	nd	nd	nd	nd	nd	nd	nd
502242	bdl	nd	nd	nd	nd	nd	nd	nd
502243	nd	nd	nd	nd	nd	nd	nd	nd
502244	nd	nd	nd	nd	nd	nd	nd	nd
502245	1.01	nd	nd	nd	nd	nd	nd	nd
502246	nd	nd	nd	nd	nd	nd	nd	nd
502247	nd	nd	nd	nd	nd	nd	nd	nd
502248	nd	nd	nd	nd	nd	nd	nd	nd
502249	nd	nd	nd	nd	nd	nd	nd	nd
502250	nd	nd	nd	nd	nd	nd	nd	nd
502251	nd	nd	nd	nd	nd	nd	nd	nd
502252	nd	nd	nd	nd	nd	nd	nd	nd
502255	nd	nd	nd	nd	nd	nd	nd	nd
502262	nd	nd	nd	nd	nd	nd	nd	nd
502268	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd
Maximum	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Standard Dev.	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00

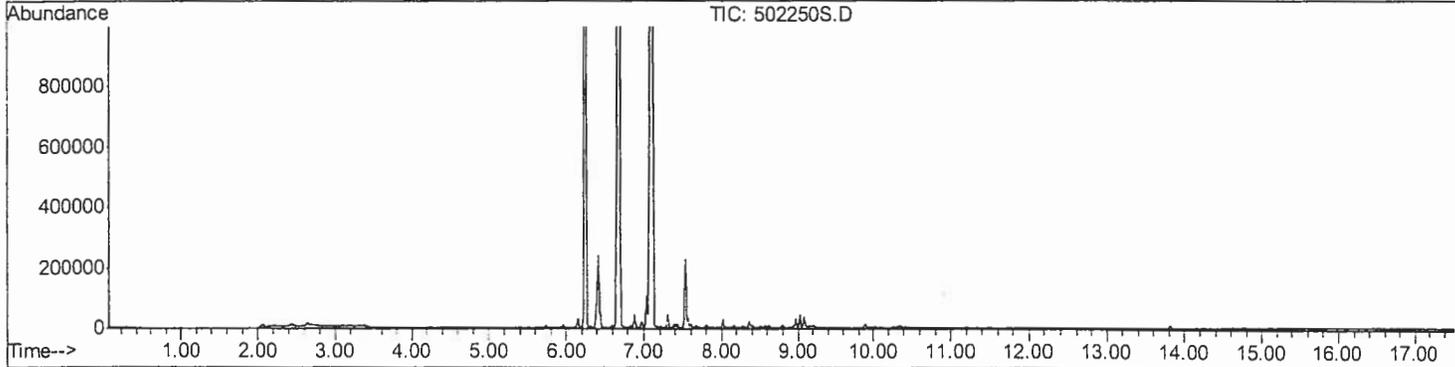
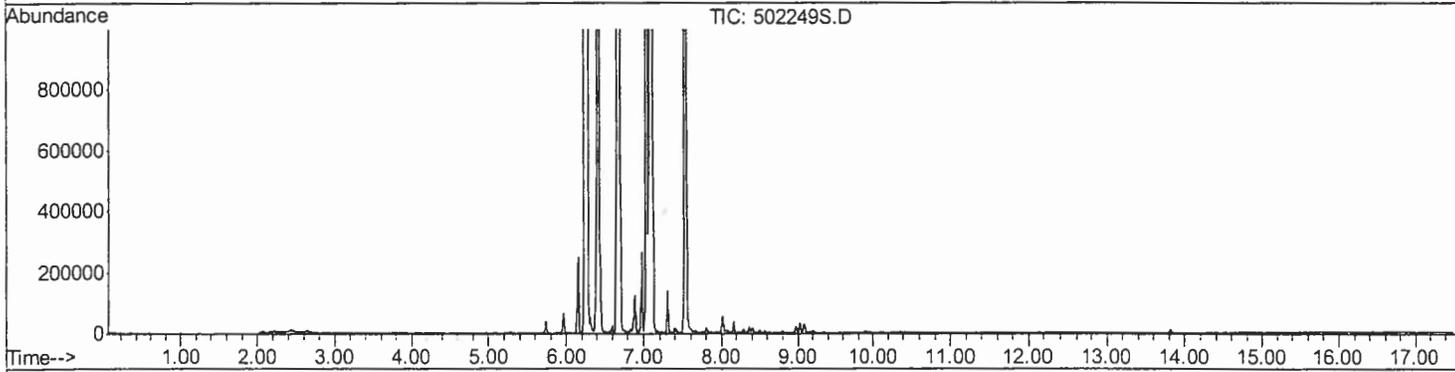
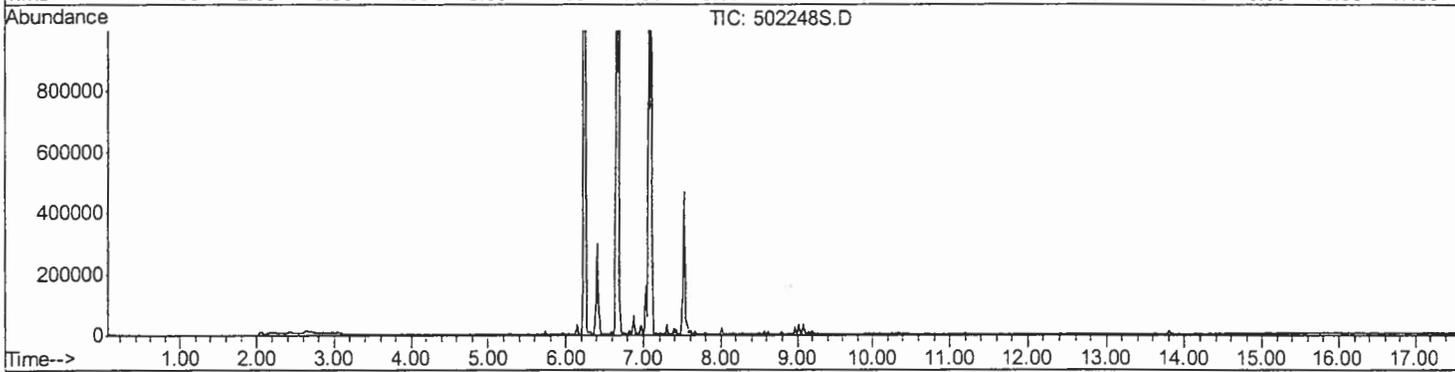
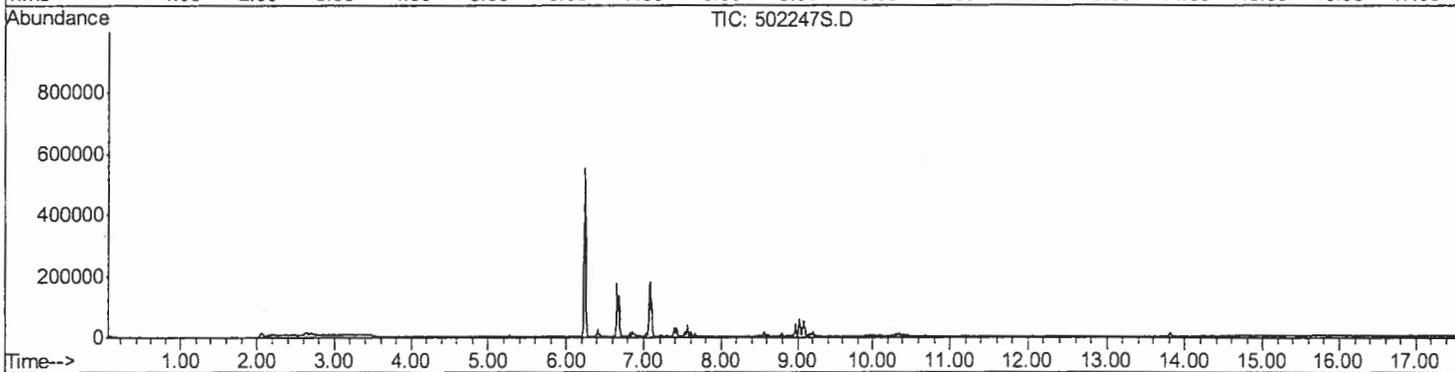
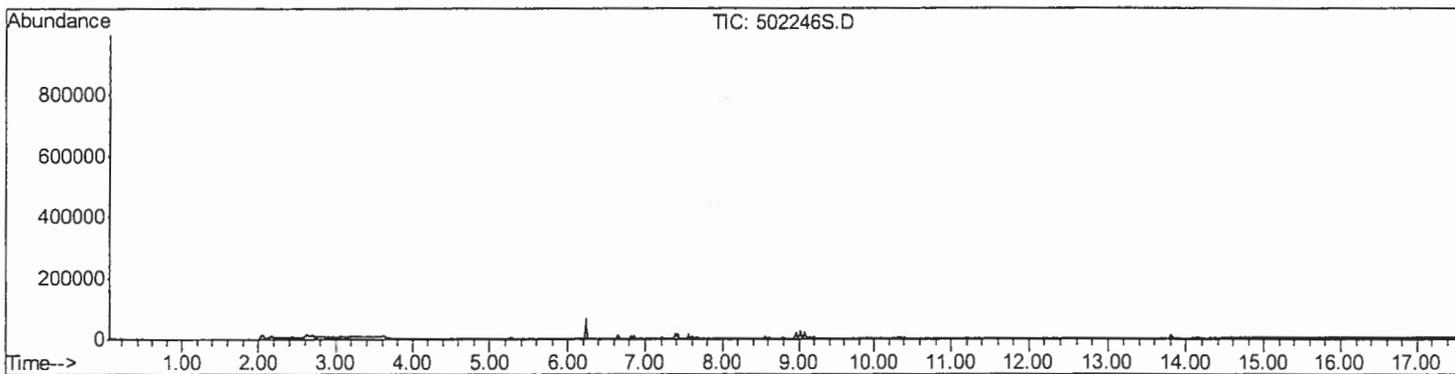
No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

TIC - SITE DMI - PRODUCTION ORDER #12793188
In Numerical Order

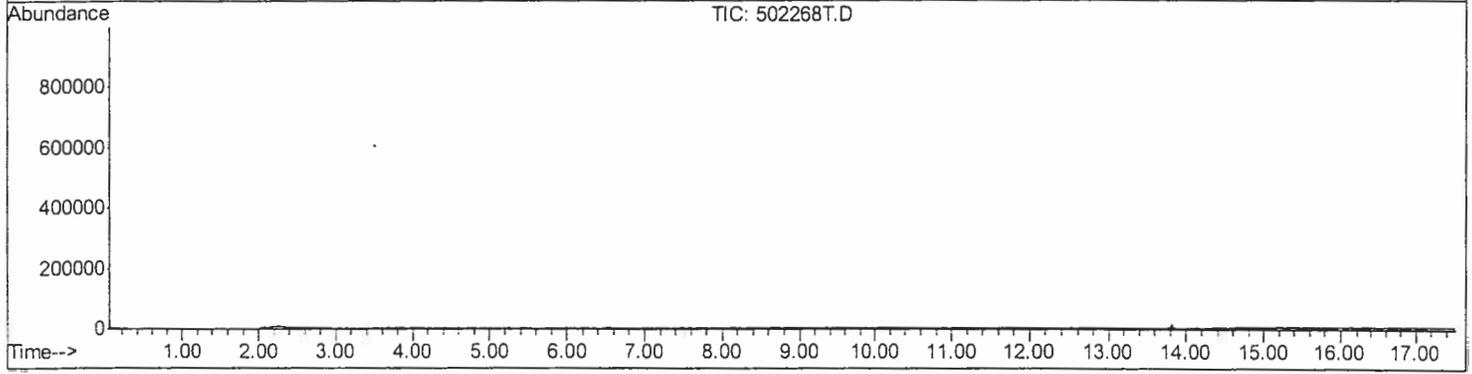
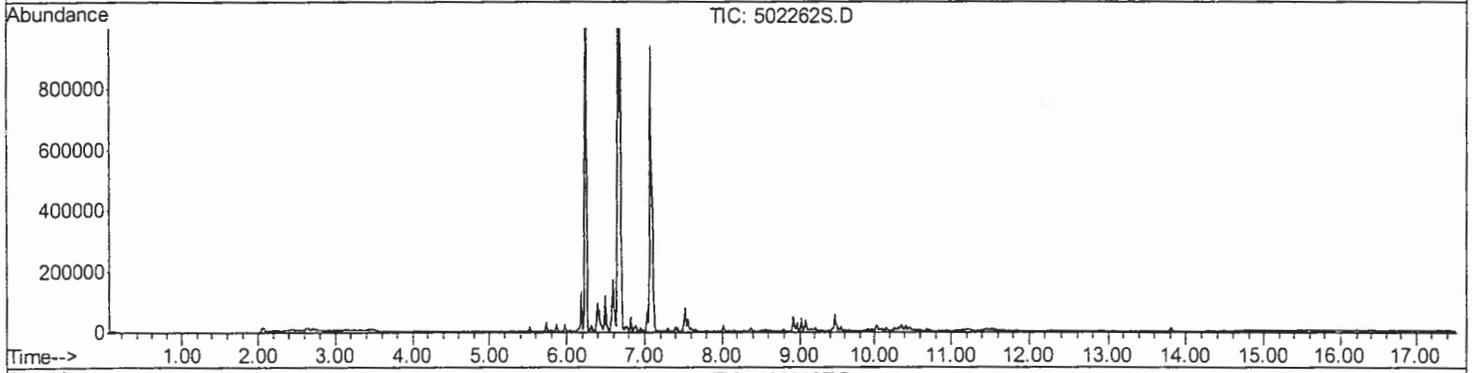
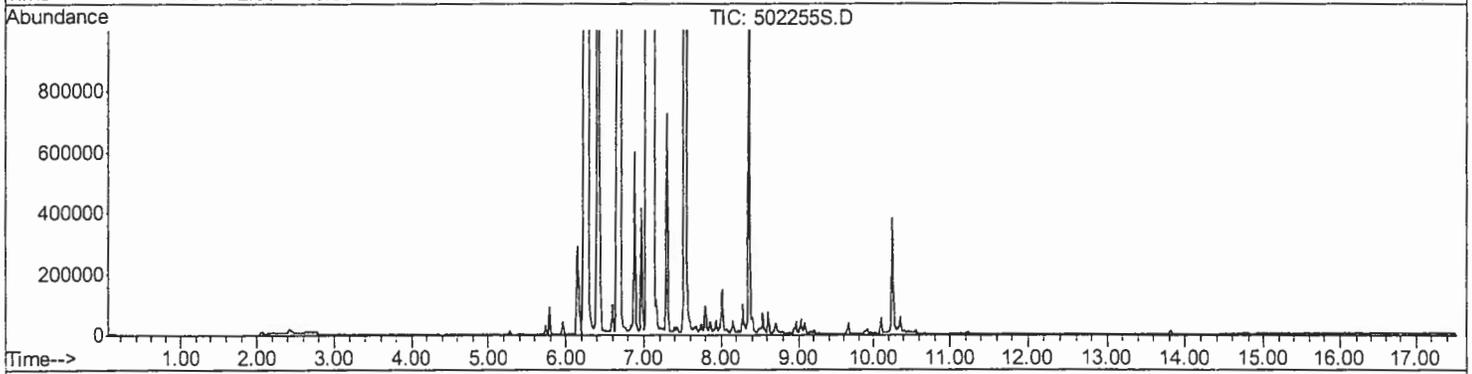
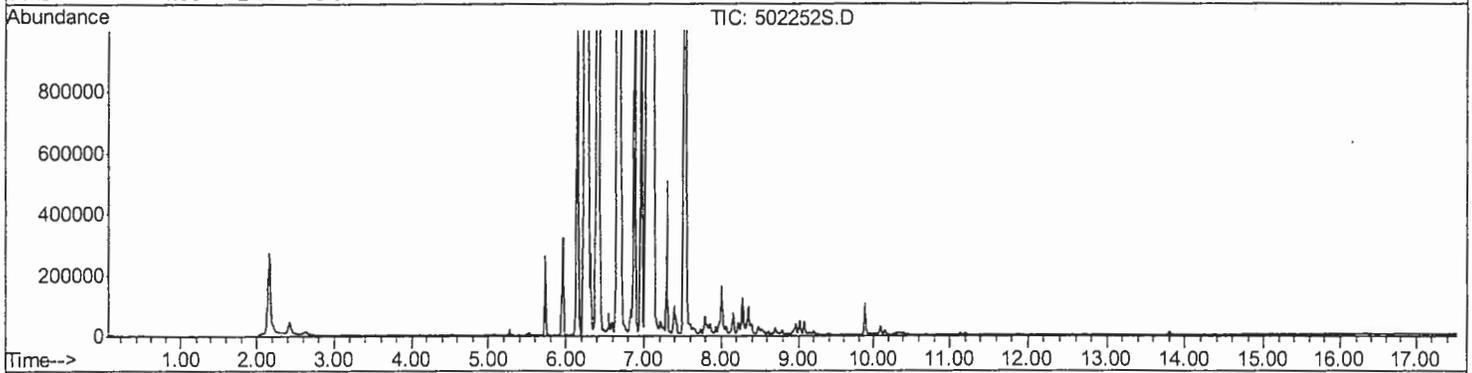
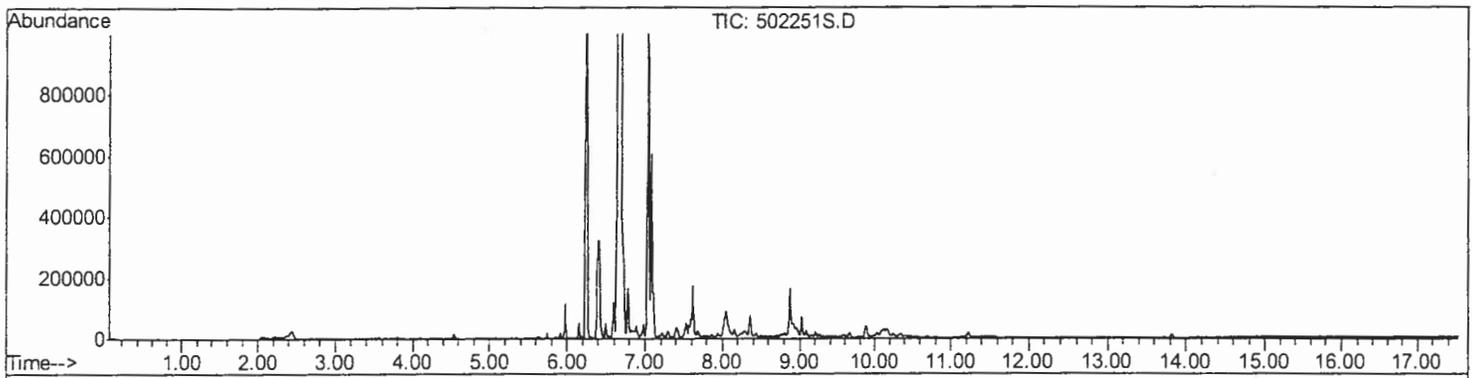


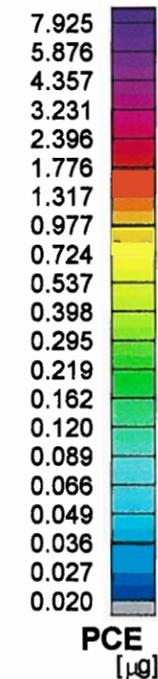
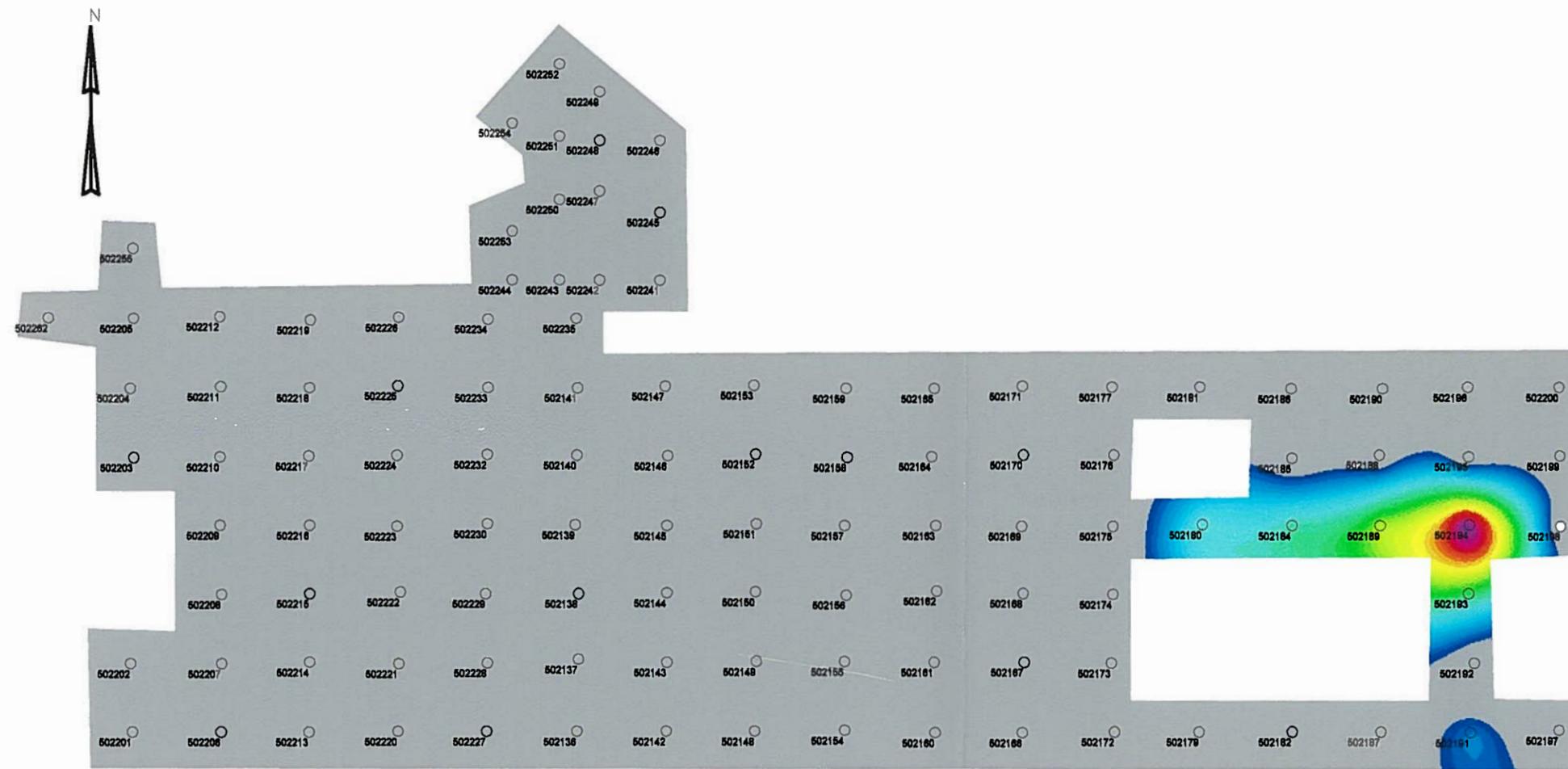
TIC - SITE DMI - PRODUCTION ORDER #12793188

In Numerical Order



In Numerical Order





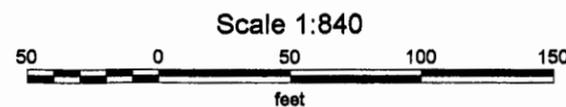
GORE(TM) Module Location
502197

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USA
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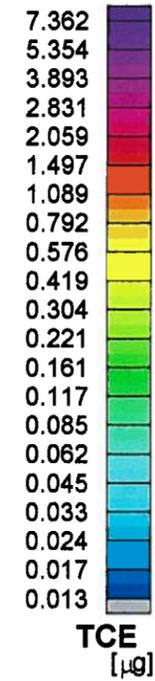
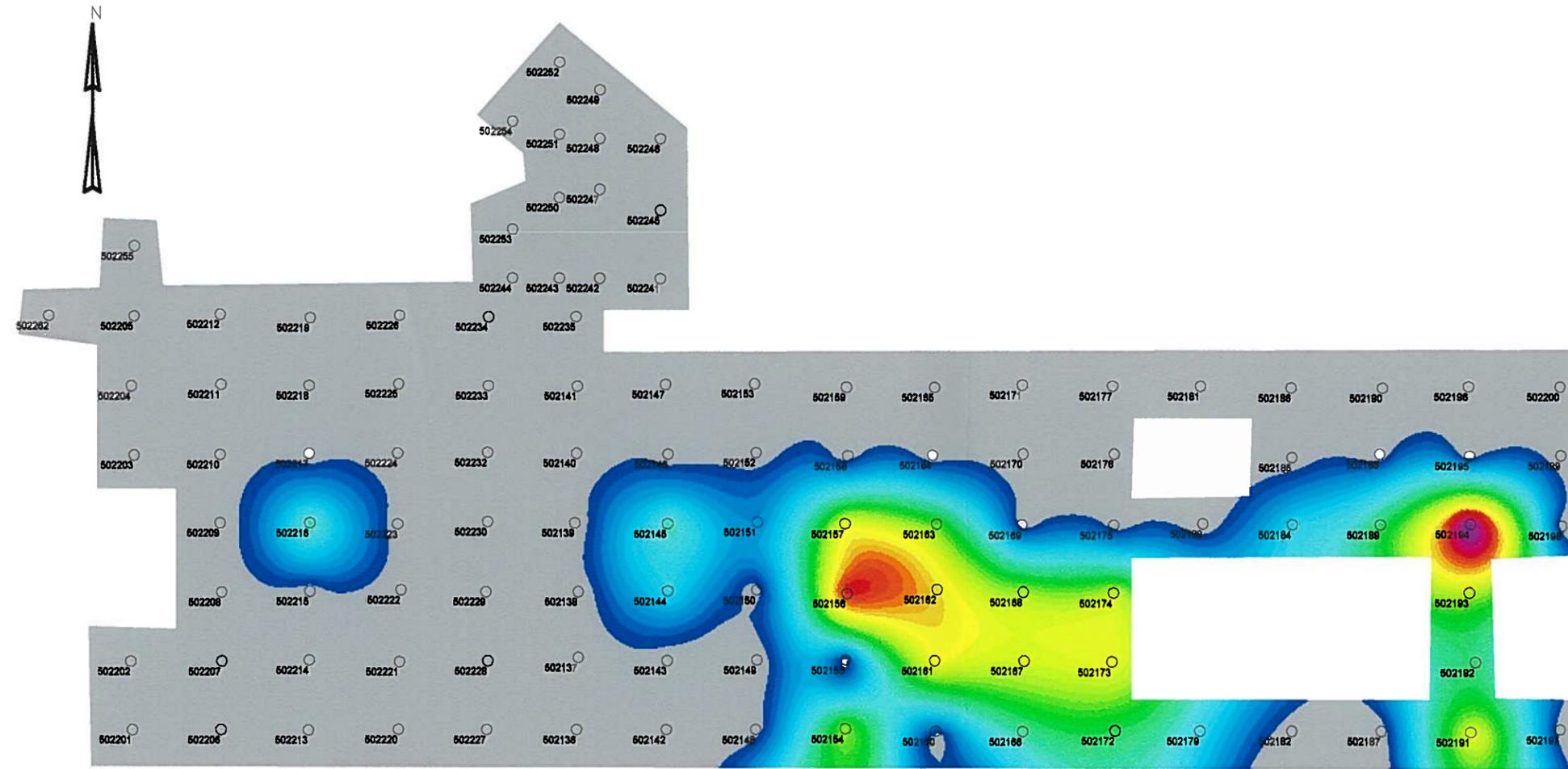
Tetra Tech NUS, Tallahassee, FL
Site 3/ NCBC Gulfport Phase 1 & 2
Tetrachloroethene



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DATE DRAWN: 07 Nov 2006	DRAWN BY: JW	ORIG. CAD: 1831...dwg	SITE CODE: DKG/ DMI
REV. DATE:	REV. #:	PROJECT NUMBER: 12792893/ 12793188	



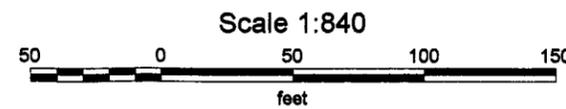
GORE(TM) Module Location
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(410) 392-7600

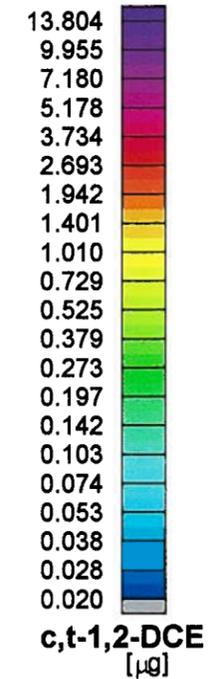
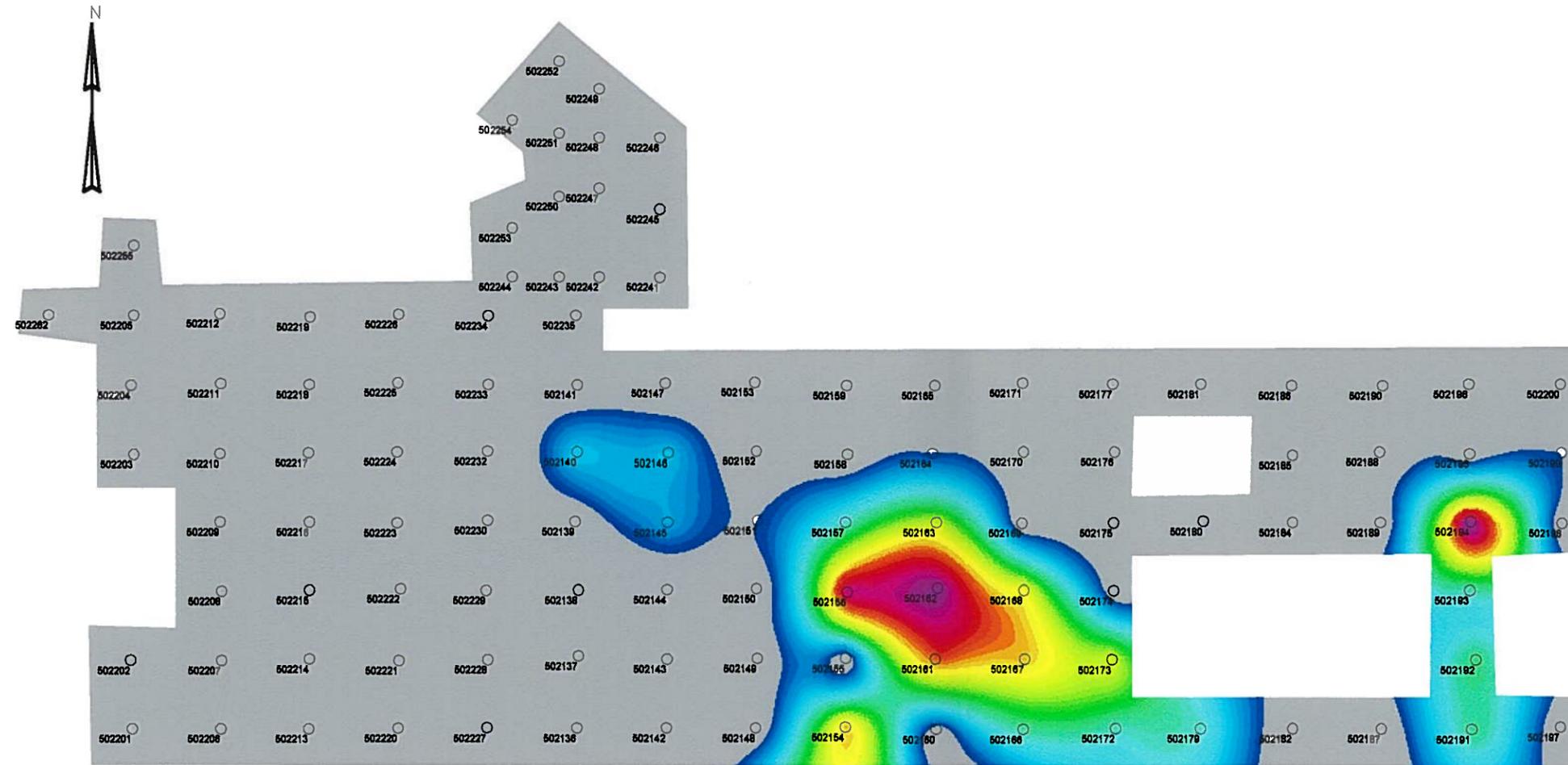
Tetra Tech NUS, Tallahassee, FL
Site 3/ NCBC Gulfport Phase 1 & 2
Trichloroethene



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DATE DRAWN: 07 Nov 2006	DRAWN BY: JW	ORIG. CAD: 1831...dwg	SITE CODE: DKG/ DMI
REV. DATE:	REV. #:	PROJECT NUMBER: 12792893/ 12793188	



GORE(TM) Module Location

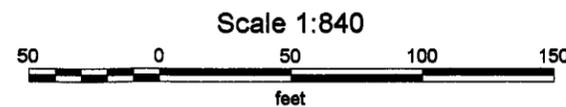
502197

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100 CHESAPEAKE BOULEVARD
ELKTON, MD, USA 21921
USA
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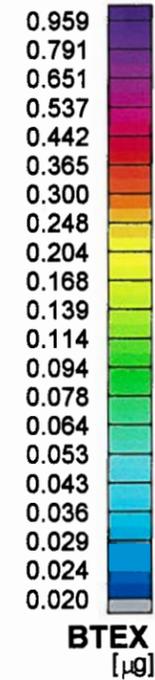
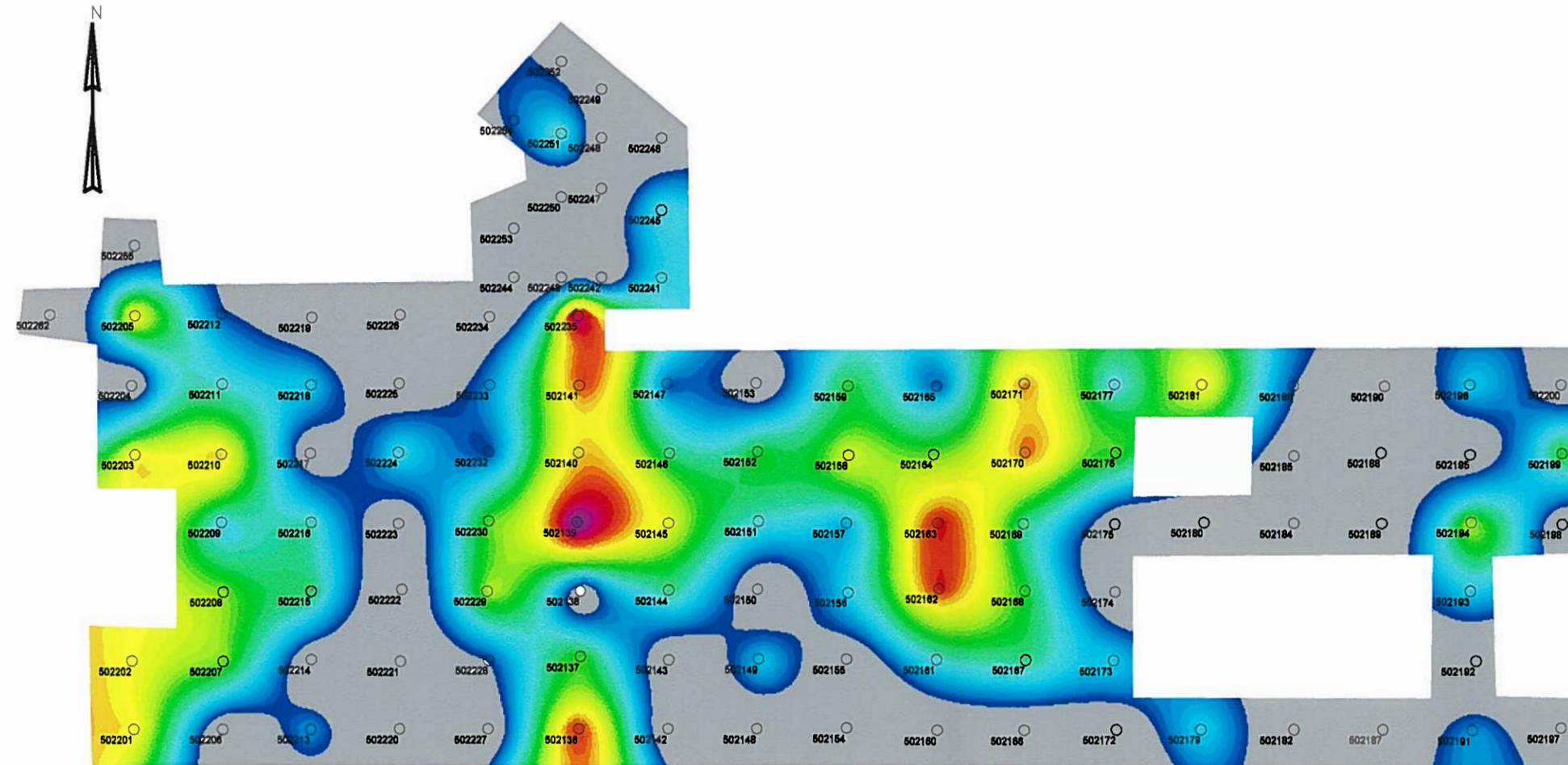
Tetra Tech NUS, Tallahassee, FL
Site 3/ NCBC Gulfport Phase 1 & 2
cis- & trans-1,2-Dichloroethene



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DATE DRAWN: 07 Nov 2006	DRAWN BY: JW	ORIG. CAD: 1831...dwg	SITE CODE: DKG/ DMI
REV. DATE:	REV. #	PROJECT NUMBER: 12792893/ 12793188	



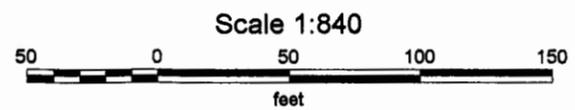
GORE(TM) Module Location
502197

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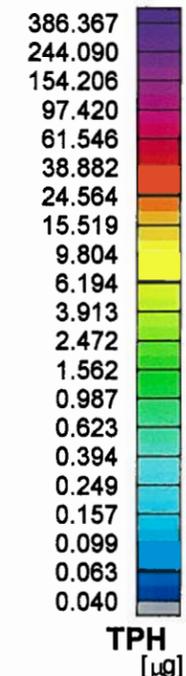
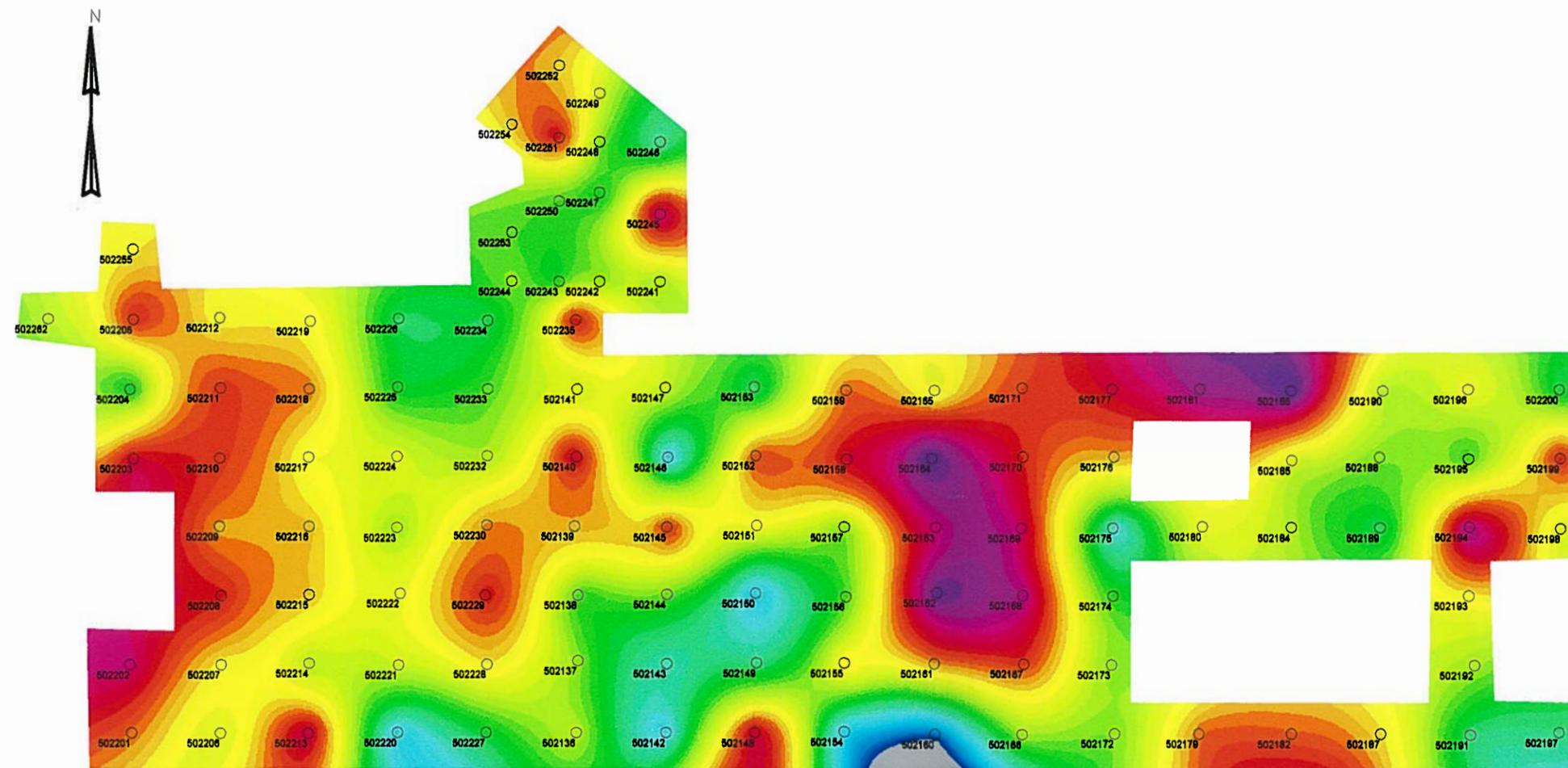
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ELKTON, MD, USA 21921
USA
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**Tetra Tech NUS, Tallahassee, FL
Site 3/ NCBC Gulfport Phase 1 & 2
BTEX**



DATE DRAWN: 07 Nov 2006	DRAWN BY: JW	ORIG. CAD: 1831...dwg	SITE CODE: DKG/ DMI
REV. DATE:	REV. #:	PROJECT NUMBER: 12792893/ 12793188	

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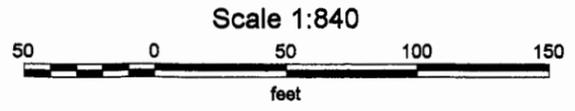
GORE(TM) Module Location
502197

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Tetra Tech NUS, Tallahassee, FL
Site 3/ NCBC Gulfport Phase 1 & 2
Total Petroleum Hydrocarbons



DATE DRAWN: 07 Nov 2006	DRAWN BY: JW	ORIG. CAD: 1831...dwg	SITE CODE: DKG/ DMI
REV. DATE:	REV. #:	PROJECT NUMBER: 12792893/ 12793188	

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APPENDIX B

FIELD DATA



Project Site Name: NCBC GULFPORT
 Project No.: CTO 041

Surface Soil
 Subsurface Soil
 Sediment
 Other: _____
 QA Sample Type: _____

Sample ID No.: 03SB0101
 Sample Location: GPT-03-MW20
 Sampled By: Bill Olson
 C.O.C. No.: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
08/14/07	6-11'	White	Sand
Time: 1515			
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	Encore	3	
SVOC/Pest/PCB/Herb	8oz Glass	1	
Metals/CN	4oz Glass	1	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB0201
Sample Location: GPT-03-MW18
Sampled By: Jason Bourgeois
C.O.C. No.:

- Surface Soil
Subsurface Soil
Sediment
Other:
QA Sample Type:

Type of Sample:
Low Concentration
High Concentration

GRAB SAMPLE DATA:

Table with 4 columns: Date, Depth Interval, Color, Description. Includes data for Date: 08/14/07, Depth: 2-7', Color: 2-6' reddish white, 6-7' dark brown, Description: silty sand, sandy silt.

COMPOSITE SAMPLE DATA:

Table with 5 columns: Date, Time, Depth Interval, Color, Description. Includes rows for Date, Method, and Monitor Readings.

SAMPLE COLLECTION INFORMATION:

Table with 4 columns: Analysis, Container Requirements, Collected, Other. Includes rows for VOC, SVOC/Pest/PCB/Herb, and Metals/CN.

OBSERVATIONS / NOTES:

MAP:

Large empty rectangular area for observations, notes, and map.

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB0301
Sample Location: GPT-03-MW21
Sampled By: Jason Bourgeois
C.O.C. No.:

- Surface Soil
Subsurface Soil
Sediment
Other:
QA Sample Type:

Type of Sample:
Low Concentration
High Concentration

GRAB SAMPLE DATA:

Table with 4 columns: Date, Depth Interval, Color, Description. Row 1: 08/15/07, 3-7', whitish gray, silty sand.

COMPOSITE SAMPLE DATA:

Table with 5 columns: Date, Time, Depth Interval, Color, Description. Multiple rows for data entry.

SAMPLE COLLECTION INFORMATION:

Table with 4 columns: Analysis, Container Requirements, Collected, Other. Rows for VOC, SVOC/Pest/PCB/Herb, Metals/CN.

OBSERVATIONS / NOTES:

MAP:

Large empty box for observations and notes.

Large empty box for map.

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:

Signature line.



SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: NCBC GULFPORT
 Project No.: CTO 041

Surface Soil
 Subsurface Soil
 Sediment
 Other: _____
 QA Sample Type: _____

Sample ID No.: 03SB0501
 Sample Location: GPT-03-MW23
 Sampled By: Jason Bourgeois
 C.O.C. No.: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: 08/15/07	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1330	3-8'	whitish/gray	silty clayey sand
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	Encore	3	
SVOC/Pest/PCB/Herb	8oz Glass	1	
Metals/CN	4oz Glass	1	

OBSERVATIONS / NOTES:**MAP:****Circle if Applicable:****Signature(s):**

MS/MSD

Duplicate ID No.:



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB0601
Sample Location: GPT-03-MW26
Sampled By: Jason Bourgeois
C.O.C. No.:

- Surface Soil
Subsurface Soil
Sediment
Other:
QA Sample Type:

Type of Sample:
Low Concentration
High Concentration

GRAB SAMPLE DATA:

Table with 4 columns: Date, Depth Interval, Color, Description. Data: 08/16/07, 3-8', redish-gray, clayey sand.

COMPOSITE SAMPLE DATA:

Table with 5 columns: Date, Time, Depth Interval, Color, Description. Includes rows for Method and Monitor Readings.

SAMPLE COLLECTION INFORMATION:

Table with 4 columns: Analysis, Container Requirements, Collected, Other. Rows for VOC, SVOC/Pest/PCB/Herb, Metals/CN.

OBSERVATIONS / NOTES:

MAP:

Large empty box for observations and notes.

Large empty box for map.

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB0701
Sample Location: GPT-03-MW28
Sampled By: Jason Bourgeois
C.O.C. No.:

- Surface Soil
Subsurface Soil
Sediment
Other:
QA Sample Type:

Type of Sample:
Low Concentration
High Concentration

GRAB SAMPLE DATA:

Table with columns: Date, Time, Method, Monitor Reading, Depth Interval, Color, Description. Includes data for 08/16/07, 1100, DPT, 0.0 ppm, 3-8' depth, and color descriptions (tan, white, gray).

COMPOSITE SAMPLE DATA:

Table with columns: Date, Time, Depth Interval, Color, Description. Includes rows for Date, Method, and Monitor Readings.

SAMPLE COLLECTION INFORMATION:

Table with columns: Analysis, Container Requirements, Collected, Other. Includes rows for VOC, SVOC/Pest/PCB/Herb, and Metals/CN.

OBSERVATIONS / NOTES:

sample collected at 3-6' bls

MAP:

Blank area for map or additional notes.

Circle if Applicable:

MS/MSD Duplicate ID No.:

Signature(s):

Blank area for signature.



Project Site Name: NCBC GULFPORT
 Project No.: CTO 041

Surface Soil
 Subsurface Soil
 Sediment
 Other: _____
 QA Sample Type: _____

Sample ID No.: 03SB0801
 Sample Location: GPT-03-MW29
 Sampled By: Jason Bourgeois
 C.O.C. No.: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: 08/16/07	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1550	3-8'	whitish gray	silty sand
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	Encore	3	
SVOC/Pest/PCB/Herb	8oz Glass	1	
Metals/CN	4oz Glass	1	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB0901
Sample Location: See Notes
Sampled By: Jason Bourgeois
C.O.C. No.:

- Surface Soil
- Subsurface Soil
- Sediment
- Other:
- QA Sample Type:

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: 08/17/07	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 0820	3-8'	whitish gray	silty sand
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	Encore	3	
SVOC/Pest/PCB/Herb	8oz Glass	1	
Metals/CN	4oz Glass	1	

OBSERVATIONS / NOTES:

collected 20' North of GPT-03-16

MAP:

Circle if Applicable:

MS/MSD Duplicate ID No.: 03SB0901D

Signature(s):



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB1001
Sample Location: See Notes
Sampled By: Jason Bourgeois
C.O.C. No.:

- Surface Soil
- Subsurface Soil
- Sediment
- Other:
- QA Sample Type:

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:08/17/07	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:0900	3-8'	whitish gray	silty sand
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	Encore	3	
SVOC/Pest/PCB/Herb	8oz Glass	1	
Metals/CN	4oz Glass	1	

OBSERVATIONS / NOTES:

collected 20' North of 03SB0901

MAP:

Circle if Applicable:

MS/MSD
03SB1001MS/MSD Duplicate ID No.:

Signature(s):



BORING LOG

PROJECT NAME: G-PT 3 R1 BORING NUMBER: 035B 11
 PROJECT NUMBER: 112 G 00464 DATE: 10-14-10
 DRILLING COMPANY: Mtw GEOLOGIST: W.A. OLSON
 DRILLING RIG: 12PT DRILLER: D. Duncan

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION		U S C S *	Remarks	PID/FID Reading (ppm)				
					Soil Density/Consistency or Rock Hardness	Color			Material Classification	Sample	Sampler BZ	Borehole**	Driller BZ**
								PID/APM					
						TAW FS no Hled		4.8					
						w/ brown							
						Brown silty sand		5.8					
						white FS		5.6					
						TAW FS w/ory no Hled		5.5					5-7
								3.7					
						orange FS							
						white FS		5.2					10-12
								4.0					
								4.1					
						orange + gray FS		7.2					035B 11 15-17 10/10
						gray sandy clay		8.8					
								5.5					
								5.5					
								4.7					

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #: _____



BORING LOG

PROJECT NAME: _____
 PROJECT NUMBER: _____
 DRILLING COMPANY: _____
 DRILLING RIG: _____

BORING NUMBER: 03SB11
 DATE: _____
 GEOLOGIST: _____
 DRILLER: _____

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
	25								PID/PPm				
							grey sandy clay and clays, sand			4.9			
										5.2			
	30						grey sandy clay 1" sand stringer			4.9			
							grey FS			4.7			
	35						grey clays sand			7.2			
							sand						
	40						green clay, stiff						

026-1104
 38-40
 0955

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____
 Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____



BORING LOG

PROJECT NAME: _____
 PROJECT NUMBER: _____
 DRILLING COMPANY: _____
 DRILLING RIG: _____

BORING NUMBER: 03SB12
 DATE: _____
 GEOLOGIST: _____
 DRILLER: _____

Sample No. and Type or RQD	Depth (Ft) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)									
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**						
	2.5																		
									grey-Dk grey S&C1 -CISA	4.5 ↑ 5.4 * 6.4 * 4.7 * 6.3 ↓									
	30								Same as above										
	35								34'+ Med S&C Grey Sand Push through To Bridge flowing Sand Layer	-734-35=6.6 Flowing Sand r/tp Casing								34-36 -ws 03GP1203	
	40								Sand filled 2 nd Attempted Pushed through -45ft									-39-41 -ws 03GP1204	
	45								green clay										
	50																		

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm):

Converted to Well: Yes No Well I.D. #: _____



BORING LOG

PROJECT NAME: _____
 PROJECT NUMBER: _____
 DRILLING COMPANY: _____
 DRILLING RIG: _____

BORING NUMBER: 035B13
 DATE: 10-15-06
 GEOLOGIST: W.D. OLSON
 DRILLER: D. DUNCAN

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION		U S C S *	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color			Material Classification	Sample	Sampler BZ	Borehole**
						gray/black silty FS		2.7				
						Brown silty sand		5.1				
						gray FS		5.8				
						omnipresent clayey sand		6.3				
						gray clayey sand		6.1				
						w/ to 1 gray FS		6.2				
								5.1				
						gray sandy clay		4.9				
								11.0				
								5.1				
								9.7				
								10.0				
						1" sand lens		9.0				

5
10
15
20
25

8-10
12-14
1036-P1302
1145

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole... Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____



BORING LOG

PROJECT NAME: CPT 3R1 BORING NUMBER: 035B01
 PROJECT NUMBER: 1126-00464 DATE: 10-10-16
 DRILLING COMPANY: mtw GEOLOGIST: W.D. Olson
 DRILLING RIG: DPY DRILLER: D. Decker

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
									PID/APP				
							Brn silty sand				0.2		
							gray FS				1.2		
							w FS		wet @ 4'		0.9		
											1.0		
							w FS				0.3		
							orange mottles				1.1		
											1.6		
											1.1		
											0.9		
							w FS				2.4		
											3.0		
											3.5		
							gray sandy clay				2.6		

046P0101
1225
6-8

046P010
1246
12-16

046P063
20-24
1312

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____ Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

4-9
12-16
19-23
4-23
19



BORING LOG

PROJECT NAME: _____ BORING NUMBER: 035B0-L
 PROJECT NUMBER: _____ DATE: _____
 DRILLING COMPANY: _____ GEOLOGIST: _____
 DRILLING RIG: _____ DRILLER: _____

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)				
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**	
	25						gray clay sand clay w/sand			4.4				
										3.5				
	30						gray sandy clay			4.6				
										4.7				
	35						gray clayey sand							
	40						gray clay trace sand							
	45													

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #: _____



BORING LOG

PROJECT NAME: GRT 3 RI
 PROJECT NUMBER: 112-G-00464
 DRILLING COMPANY: MPL
 DRILLING RIG: DPT

BORING NUMBER: 03SB02
 DATE: 10/10/06
 GEOLOGIST: W.D. Olson
 DRILLER: D. Dunlop

Sample No. and Type or RQD	Depth (Ft) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft) or Screened Interval	MATERIAL DESCRIPTION		USCS*	Remarks	PID/FID Reading (ppm)				
					Soil Density/Consistency or Rock Hardness	Color			Material Classification	Sample	Sampler BZ	Borehole**	Driller BZ**
						BRN silty clay		PI/FAH					
						black asphalt / ^{blue} plastic clay							
						wht FS							
						w/clay strings/glass							
						w FS		water @ 4'					
						trace silt							
						± TW FS							
						wht FS							
						TW FS, some clay strings							
						orange FS							
						gray clayey sand							
						gray clayey sand and clay							
						gray sandy clay							

5

10

15

20

25

03GP020
6-10

CO=50

CO=51
03GP020
CO=83

CO=22
14-11
09/06

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm): 0.0

Converted to Well: Yes _____ No _____ Well I.D. #: _____

42

38

6-8
10-12

14-18



BORING LOG

PROJECT NAME: _____
 PROJECT NUMBER: _____
 DRILLING COMPANY: _____
 DRILLING RIG: _____

BORING NUMBER: 03SR02
 DATE: _____
 GEOLOGIST: _____
 DRILLER: _____

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			USCS*	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
	25						Sand		PID/PPM	0.0			
										0.0			
							Sandier			0.0			
	30						gray sandy clay			0.0			
										0.0			
										0.0			
	35						gray med sand qtz, subrounded			0.0			
										0.0			
										0.0			
	40									0.0			
										0.0			
										0.0			
	45						green/gray plastic clay						
	50												

036-P0205
 38 0045
 42
 43

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #: _____



BORING LOG

PROJECT NAME: GAT 3 RI BORING NUMBER: 035B03
 PROJECT NUMBER: 112600464 DATE: 10/11/06
 DRILLING COMPANY: MPW GEOLOGIST: W.A. Olsen
 DRILLING RIG: DPT DRILLER: D. Dunen

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
	25								1.1				
									1.1				
									1.0				
	30								1.0				
									1.2				
									1.0				
	35								1.2				
									1.1				
	40												
	45												
	50												

grey sandy clay
 grey tan clayey sand
 1" Fine sand lens @ 33 1/2
 grey fine to med sand

035B03
 40-42
 1515

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.
 Remarks: _____ Drilling Area Background (ppm): _____

Converted to Well: Yes No Well I.D. #: _____



BORING LOG

PROJECT NAME: GAT 3 RI BORING NUMBER: 035R04
 PROJECT NUMBER: 112G-00464 DATE: 10-11-06
 DRILLING COMPANY: MPW GEOLOGIST: W.A. Olson
 DRILLING RIG: DPT DRILLER: D. Dunca

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION		U S C S *	Remarks	PID/FID Reading (ppm)								
					Soil Density/Consistency or Rock Hardness	Color			Material Classification	Sample	Sampler BZ	Borehole**	Driller BZ**				
						BRN silty clay											
						blk silty FS w/ wood debris		0.9									
						white silty FS		5.9									
						BRN silty FS		5.7									
						white FS w/ clay		1.2		water 7/							
								0.6									
						Lt gray FS		0.8									
								0.8									
								0.5									
						increased clay		1.0									
						gray clay		1.0									
						gray sandy clay		0.9									
								0.8									
								1.0									

5

10

15

20

04G-P0401
9-11
NO SAND

03G-P04102
12-16
1735

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.
 Remarks: _____ Drilling Area Background (ppm):

Converted to Well: Yes No Well I.D. #: _____

6-10
12-16
21-43



BORING LOG

PROJECT NAME: _____ BORING NUMBER: 035B04
 PROJECT NUMBER: _____ DATE: _____
 DRILLING COMPANY: _____ GEOLOGIST: _____
 DRILLING RIG: _____ DRILLER: _____

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)										
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**							
	25						Gray Sandy Clay													
									1.0											
							gray clayey sand													
				X			Brown wood debris													
				X			gray sandy clay													
									0.7											
							Brown wood debris ^{frass} contact													
							Light/whit sandy clay													
									0.5											
									0.9											
							White FS													
									0.7											
							shale clay 6"													
									0.5											
									0.7											

036-P400:
42-44
1715

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #: _____



BORING LOG

PROJECT NAME: C-PT 3 RI BORING NUMBER: 03GB05
 PROJECT NUMBER: 112600464 DATE: 10-12-06
 DRILLING COMPANY: MTW GEOLOGIST: W.D. Olson
 DRILLING RIG: DPT DRILLER: D. Dunca

Sample No. and Type or RQD	Depth (Ft) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft) or Screened Interval	MATERIAL DESCRIPTION		U S C S *	Remarks	PID/FID Reading (ppm)					
					Soil Density/Consistency or Rock Hardness	Color			Material Classification	Sample	Sampler BZ	Borehole**	Driller BZ**	
								PID/APP						
						Brown silty sand		0.9						
						Orange clay								
						brown @ contact		1.4						
						gray silty FS		1.1						
5						Brown clayey silt		1.1						
						white FS		2.4						
10								1.9						03G-P0501 10-12 1328
								2.5						
15								1.2						
						grades to lt. gray		0.8						03G-P0502 16-18' 1320
						BRN FS		0.9						
20						gray sandy clay		0.9						
								0.9						
25								0.8						

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Converted to Well: Yes _____ No Well I.D. #: _____

Drilling Area Background (ppm):



BORING LOG

PROJECT NAME: _____
 PROJECT NUMBER: _____
 DRILLING COMPANY: _____
 DRILLING RIG: _____

BORING NUMBER: 033B05
 DATE: _____
 GEOLOGIST: _____
 DRILLER: _____

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION		USCS*	Remarks	PID/FID Reading (ppm)				
					Soil Density/Consistency or Rock Hardness	Color			Material Classification	Sample	Sampler BZ	Borehole**	Driller BZ**
	25							PIA PPM					
						gray sandy clay		0.8					
						some int. sandier & some clayier		1.1					
	30					gray sandy clay		0.8					
						wood frags @ 34'		0.7					
								1.0					
	35					gray sandy clay		0.6					
								0.5					
								0.6					
	40					clayey gray FS @ 39.5'							
						grades to fine to med g + 2 sand, gray							
	45												
	50					green Plastic clay							

036-P050
43-45
1300

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____
 Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #: _____

50-55 - green plastic clay



BORING LOG

PROJECT NAME: GPT 3 RI BORING NUMBER: 035806
 PROJECT NUMBER: 112G00464 DATE: 10-12-06
 DRILLING COMPANY: M+W GEOLOGIST: W.D. Olson
 DRILLING RIG: DPI DRILLER: A. Duncan

Sample No. and Type or BGD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
									DID/APM				
									0.7				
									1.2				
									wet 0.4				
									0.5				
									0.5				
									0.4				
									0.5				
									0.4				
									0.5				
									0.4				
									0.5				
									0.4				
									0.4				
									0.4				

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.
 Remarks: _____
 Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well ID #: _____



BORING LOG

PROJECT NAME: _____ BORING NUMBER: 03 SB06
 PROJECT NUMBER: _____ DATE: _____
 DRILLING COMPANY: _____ GEOLOGIST: _____
 DRILLING RIG: _____ DRILLER: _____

Sample No. and Type or RQD	Depth (FT.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FT.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)							
					Soil Density/ Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole*	Driller BZ*				
	25						gray silty clay sandier close to 30'										
										0.3							
										0.4							
	30									0.6							
										0.9							
										0.9							
	35									0.4							
										0.4							
										0.5							
	40																
	45																

03G-P0801
 40-44
 1637

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.
 Remarks: _____ Drilling Area Background (ppm): _____
 Converted to Well: Yes _____ No _____ Well I.D. #: _____



BORING LOG

PROJECT NAME: GPT 3 RI
 PROJECT NUMBER: 112600464
 DRILLING COMPANY: MFW
 DRILLING RIG: DDT

BORING NUMBER: 035B07
 DATE: 10-13-06
 GEOLOGIST: W.D. O'Son
 DRILLER: D. Duncu

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)			
					Soil Density/ Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
									PID/PPM				
									6.1				
									1.1				
									moist LV				
									4.0				
									wet @ 6'				
									5.9				
									6.5				
									6.7				
									4.6				
									6.1				
									5.8				
									4.7				

5
10
15
20
25

036P070
11207-9
6-12-06
11-13
036P070
14-16
16-18
18-21
15-17
036P070
1056

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm):

Converted to Well: Yes No Well I.D.#: _____



BORING LOG

PROJECT NAME: GPT 3 R1
 PROJECT NUMBER: 112600464
 DRILLING COMPANY: m+w
 DRILLING RIG: DPT

BORING NUMBER: 035B08
 DATE: 10-13-06
 GEOLOGIST: W.D. Olson
 DRILLER: D. Duncan

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			USCS*	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
							Brown Silty FS		5.3				
							gray silty FS						
							some black sand rock frags		6.8				
							tan FS + silt		5.4				
							grades to ↓						
							white FS		6.5				
							↓		5.4				
							↓		3.9				
							↓		5.5				
							↓		5.6				
							grades to tan/ and orange FS		3.8				
							gray FS		6.7				
							gray sandy clay		7.3				
							↓		6.8				
							↓		6.5				

8-10
 13-15
 14-12
 035B08
 18-20
 1400

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole... Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm):

Converted to Well: Yes No Well I.D. #: _____



Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: GPT Project No.: 1126
 Location: Site 3 R1 Personnel: W.D. Olson
 Weather Conditions: Cloudy, occ. rain Measuring Device: WLI
 Tidally Influenced: Yes No Remarks: _____

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
2143	10-30-07	0922		29.30	3.64	~		2"
SG-1	10-30	0927		—	2.38	—		Staff gauge in casing
2154	10-30	0931		34.55	1.43	—		1"
2155	10-30	0935		19.36	1.97	—		1"
2162	10-30	0939		19.55	1.13	—		2"
2151	10/30	0944		23.72	2.37	—		1"
2152	10/30	0946		34.52	1.76	—		1"
2153	10/30	0949		40.66	1.52	—		1"
2132	10/30	0958		26.59	3.05	—		2" - ABB
2148	10/30	1005		29.19	5.76	—		1"
SG-2	10/30	1010		—	4.08	—		1" N. POW
2146	10/30	1012		29.23	3.63	—		2"
2145	10/30	1014		40.04	3.42	—		1"
2134	10/30	1022		14.40	2.71	—		2" ABB
2147	10/30	1026		29.52	2.87	—		1"
2149	10/30	1031		29.27	2.99	—		1"
2133	10/30	1036		23.37	1.74	—		2" ABB
2136	10/30	1040		29.45	2.23	—		1"
2135	10/30	1055		20.14	1.60	—		2"
2160	10/30	1059		25.39	2.49	—		2"
2158	10/30	1104		24.95	1.99	—		2"
2159	10/30	1107		49.65	2.56	—		1"
2161	10/30	1115		19.88	3.07	~		2"
2166	10/30	1121		24.39	3.53	—		2"
SG-3	10/30	1126		—	4.70	~		Golf Links

* All measurements to the nearest 0.01 foot



GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NCBC Gulfport Site 3
Project No.: 112G00464

Sample ID No.: GPT-03-186W-01
Sample Location: GPT-03-18
Sampled By: JB
C.O.C. No.: _____
Type of Sample:
 Low Concentration
 High Concentration

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

SAMPLING DATA:

Date:	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
<u>9/5/07</u>	<u>clear</u>	<u>6.85</u>	<u>28</u>	<u>24.1</u>	<u>75.8</u>	<u>1.7</u>	<u>0.0</u>	<u>ORP -114</u>

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
<u>9/5/07</u>	<u>Initial</u>	<u>7.51</u>	<u>33</u>	<u>25.0</u>	<u>999</u>	<u>2.5</u>	<u>0.0</u>	<u>-187</u>
Method: <u>peristaltic</u>	<u>1st</u>	<u>7.26</u>	<u>33</u>	<u>24.3</u>	<u>999</u>	<u>4.6</u>	<u>0.0</u>	<u>-185</u>
Monitor Reading (ppm): <u>0</u>	<u>2nd</u>	<u>7.01</u>	<u>27</u>	<u>23.9</u>	<u>999</u>	<u>1.0</u>	<u>0.0</u>	<u>-126</u>
Well Casing Diameter & Material: <u>1" PVC</u>	<u>3rd</u>	<u>6.66</u>	<u>29</u>	<u>23.6</u>	<u>230</u>	<u>0.4</u>	<u>0.0</u>	<u>-105</u>
Type: <u>1" PVC</u>	<u>4th</u>	<u>6.84</u>	<u>28</u>	<u>23.4</u>	<u>150</u>	<u>1.2</u>	<u>0.0</u>	<u>-111</u>
Total Well Depth (TD): <u>40.06</u>	<u>5th</u>	<u>6.85</u>	<u>28</u>	<u>24.1</u>	<u>75.8</u>	<u>1.7</u>	<u>0.0</u>	<u>-114</u>
Static Water Level (WL): <u>3.9</u>								
One Casing Volume (gal/L): <u>1.45</u>								
Start Purge (hrs): <u>1130</u>								
End Purge (hrs): <u>1310</u>								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

400mL/min
*Water extremely turbid, will purge/develop for a while.

Circle if Applicable:

MS/MSD	Duplicate ID No.:
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Signature(s):



Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NCBC Gulfport
Project No.: 112600968

Sample ID No.: GPT-03-2064-00
Sample Location: GPT-03-20
Sampled By: JB
C.O.C. No.: _____

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

- Type of Sample:
 - Low Concentration
 - High Concentration

SAMPLING DATA:

Date: <u>8/30/07</u>	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Time:								
Method:								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:	<u>Initial</u>	<u>6.5</u>	<u>21</u>	<u>24.9</u>	<u>120</u>	<u>1.9</u>	<u>0.0</u>	<u>-102</u>
Monitor Reading (ppm):	<u>1st</u>	<u>5.8</u>	<u>18</u>	<u>24.2</u>	<u>47</u>	<u>1.0</u>	<u>0.0</u>	<u>-40</u>
Well Casing Diameter & Material Type:	<u>2nd</u>	<u>5.7</u>	<u>16</u>	<u>23.4</u>	<u>180</u>	<u>0.9</u>	<u>0.0</u>	<u>-22</u>
Total Well Depth (TD):	<u>3rd</u>							
Static Water Level (WL):	<u>28.19</u>							
One Casing Volume(gal/L):	<u>6.23</u>							
Start Purge (hrs):	<u>.92</u>							
End Purge (hrs):	<u>1442</u>							
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

400 mL/min

Circle if Applicable:

MS/MSD	Duplicate ID No.:
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Signature(s):



Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page of

Project Site Name: NEBC Gulfport
Project No.: 112G00464

Sample ID No.: GPT-03-216W-001
Sample Location: GPT-03-21
Sampled By: JB/MP
C.O.C. No.:
Type of Sample:
 Low Concentration
 High Concentration

- Domestic Well Data
- Monitoring Well Data
- Other Well Type:
- QA Sample Type:

SAMPLING DATA:

Date: <u>08/29/07</u>	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Time: <u>1755</u>								
Method: <u>peristaltic</u>								

PURGE DATA:

Date: <u>08/29/07</u>	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: <u>peristaltic</u>	<u>Intal</u>							
Monitor Reading (ppm): <u>0</u>	<u>180</u>	<u>6.05</u>	<u>16.7</u>	<u>24.8</u>	<u>58</u>	<u>1.30</u>	<u>0.0</u>	<u>-69</u>
Well Casing Diameter & Material	<u>1751</u>	<u>6.29</u>	<u>15.0</u>	<u>24.5</u>	<u>200</u>	<u>9.9</u>	<u>0.0</u>	<u>-43</u>
Type: <u>1" PVC</u>	<u>1112</u>	<u>6.22</u>	<u>16.1</u>	<u>26.9</u>	<u>39</u>	<u>3.9</u>	<u>0.0</u>	<u>-58</u>
Total Well Depth (TD): <u>2927</u>								
Static Water Level (WL): <u>3.71</u>								
One Casing Volume(gal/L): <u>1.02</u>								
Start Purge (hrs): <u>0933</u>								
End Purge (hrs): <u>1755</u>								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

6.55

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
<u>VOC</u>			

OBSERVATIONS / NOTES:

200 mL/min
1751 - 10.52 (W) of water, collect reading & sample
1112 (930) - 6.55 (WL), collect reading and sample

Circle if Applicable: MS/MSD Duplicate ID No.:

Signature(s):



GROUNDWATER SAMPLE LOG SHEET

Project Site Name: _____
 Project No.: _____
 Domestic Well Data
 Monitoring Well Data
 Other Well Type: _____
 QA Sample Type: _____

Sample ID No.: _____
 Sample Location: GPT-03-22
 Sampled By: _____
 C.O.C. No.: _____
 Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date:	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Time: <u>1815</u>								
Method:								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:	<u>Initial</u>	<u>6.6</u>	<u>44</u>	<u>25.7</u>	<u>78</u>	<u>1.8</u>	<u>0.0</u>	<u>-100</u>
Monitor Reading (ppm):	<u>180</u>	<u>6.6</u>	<u>42</u>	<u>25.5</u>	<u>60</u>	<u>1.1</u>	<u>0.0</u>	<u>-103</u>
Well Casing Diameter & Material	<u>2nd.</u>				<u>PC</u>			
Type:	<u>1610</u>	<u>6.48</u>	<u>49.8</u>	<u>25.7</u>	<u>90</u>	<u>3.2</u>	<u>0.0</u>	<u>-72</u>
Total Well Depth (TD): <u>29.43</u>	<u>1058</u>	<u>6.40</u>	<u>47.1</u>	<u>26.9</u>	<u>67</u>	<u>2.6</u>	<u>0.0</u>	<u>-65</u>
Static Water Level (WL): <u>3.22</u>								
One Casing Volume(gal/L): <u>1.05</u>								
Start Purge (hrs): <u>0852</u>								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

GRIP
DTU
21.80
3.18

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

300mL/min
 * 0920 - well purged dry, allow recharge
1610 - well completely recharged, collect reading and sample
1058 (8/20) - well recharged, collect reading and sample

Circle if Applicable: _____ Signature(s): _____

MS/MSD	Duplicate ID No.:
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Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NCBC Gulfport
Project No.: 112600464

Sample ID No.: GPT-03-236W-001
Sample Location: GPT-03-23
Sampled By: JB/MP
C.O.C. No.: _____
Type of Sample:
 Low Concentration
 High Concentration

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

SAMPLING DATA:

Date: <u>8/29/07</u>	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Time: <u>1445</u>								
Method: <u>peristaltic</u>								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
<u>8/29/07</u>								<u>ORP</u>
Method: <u>peristaltic</u>	Initial	<u>6.10</u>	<u>40.5</u>	<u>24.3</u>	<u>600</u>	<u>4.8</u>	<u>0.0</u>	<u>-85</u>
Monitor Reading (ppm): <u>0</u>	1st	<u>5.87</u>	<u>39.1</u>	<u>23.9</u>	<u>81</u>	<u>9.4</u>	<u>0.0</u>	<u>-57</u>
Well Casing Diameter & Material	2nd	<u>5.87</u>	<u>41.6</u>	<u>24.0</u>	<u>7.62</u>	<u>0.8</u>	<u>0.0</u>	<u>-60</u>
Type: <u>1" PVC</u>	3rd	<u>5.87</u>	<u>46.5</u>	<u>24.1</u>	<u>5.61</u>	<u>0.7</u>	<u>0.0</u>	<u>-63</u>
Total Well Depth (TD): <u>23.72</u>								
Static Water Level (WL): <u>2.53</u>								
One Casing Volume (gal/L): <u>.85</u>								
Start Purge (hrs): <u>1405</u>								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

400mL/min

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	



Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page of

Project Site Name: NCBC Golfport
Project No.: 112G00464

Sample ID No.: GPT-03-24GW-001

Sample Location: GPT-03-24

Sampled By: OB/MP

C.O.C. No.:

- Domestic Well Data
- Monitoring Well Data
- Other Well Type:
- QA Sample Type:

- Type of Sample:
- Low Concentration
- High Concentration

SAMPLING DATA:

Date: <u>8/29/07</u>	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Time: <u>1515</u>								
Method: <u>peristaltic</u>								

PURGE DATA:

Date: <u>8/29/07</u>	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: <u>peristaltic</u>	Initial	6.4	22	24.3	126	1.5	0.0	-101
Monitor Reading (ppm): <u>0</u>	1st	6.4	21	24.3	100	3.9	0.0	-70
Well Casing Diameter & Material	2nd	6.5	20	24.6	28.6	6.4	0.0	-60
Type: <u>1" PVC</u>	3rd	6.7	19	24.6	27.4	6.6	0.0	-69
Total Well Depth (TD): <u>34.52</u>								
Static Water Level (WL): <u>2.17</u>								
One Casing Volume(gal/L): <u>1.3</u>								
Start Purge (hrs): <u>1406</u>								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

ORP
DU
1932

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

400 mL/min.

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):



Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page of

Project Site Name: _____
Project No.: _____

Sample ID No.: _____
Sample Location: GPT-03-26
Sampled By: _____
C.O.C. No.: _____
Type of Sample:
 Low Concentration
 High Concentration

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

SAMPLING DATA:

Date: _____	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Time: <u>0940</u>								
Method: _____								

PURGE DATA:

Date: _____	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: _____	<u>Initial</u>	<u>6.22</u>	<u>44.6</u>	<u>25.4</u>	<u>200</u>	<u>2.5</u>	<u>0.0</u>	<u>-62</u>
Monitor Reading (ppm):	<u>1st</u>	<u>6.26</u>	<u>45.6</u>	<u>25.3</u>	<u>47</u>	<u>0.8</u>	<u>0.0</u>	<u>-68</u>
Well Casing Diameter & Material	<u>2nd</u>	<u>6.20</u>	<u>45.2</u>	<u>25.3</u>	<u>25</u>	<u>0.7</u>	<u>0.0</u>	<u>-69</u>
Type:	<u>3rd</u>	<u>6.20</u>	<u>44.7</u>	<u>25.6</u>	<u>1.96</u>	<u>2.3</u>	<u>0.0</u>	<u>-64</u>
Total Well Depth (TD): <u>19.35</u>								
Static Water Level (WL): <u>1.75</u>								
One Casing Volume(gal/L): <u>.70</u>								
Start Purge (hrs): <u>9:10</u>								
End Purge (hrs): <u>9:38</u>								
Total Purge Time (min): _____								
Total Vol. Purged (gal/L): _____								

DRP
DKW
2.5 pt

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

300ml/min.

Circle if Applicable:

<input type="checkbox"/> MS/MSD	Duplicate ID No.: _____
---------------------------------	-------------------------

Signature(s): _____



Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Page of

Project Site Name: _____
Project No.: _____

Sample ID No.: _____
Sample Location: GPT-03-27

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

Sampled By: _____
C.O.C. No.: _____
Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date:	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Time:								
Method:								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:	<u>Initial</u>	<u>6.52</u>	<u>16.8</u>	<u>25.1</u>	<u>3</u>	<u>1.6</u>	<u>0.0</u>	<u>-100</u>
Monitor Reading (ppm):	<u>1st</u>	<u>6.43</u>	<u>15.9</u>	<u>24.4</u>	<u>370</u>	<u>0.7</u>	<u>0.0</u>	<u>-95</u>
Well Casing Diameter & Material	<u>2nd</u>	<u>6.37</u>	<u>15.2</u>	<u>23.9</u>	<u>280</u>	<u>0.7</u>	<u>0.0</u>	<u>-92</u>
Type:	<u>3rd</u>	<u>6.35</u>	<u>15.4</u>	<u>24.2</u>	<u>966</u>	<u>0.7</u>	<u>0.0</u>	<u>-100</u>
Total Well Depth (TD): <u>34.55</u>	<u>HYDRAUL</u>							
Static Water Level (WL): <u>1.93</u>								
One Casing Volume (gal/L): <u>1.3</u>								
Start Purge (hrs): <u>0805</u>								
End Purge (hrs): <u>8:40</u>								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

ORP

DTW

6.85

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

400 mL/min

Circle if Applicable:
MS/MSD Duplicate ID No.: _____

Signature(s): _____



GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NCBC Golfport
Project No.: 112600464

Sample ID No.: GPT-03-28GW-001

Sample Location: GPI-03-28

Sampled By: JB

C.O.C. No.: _____

Type of Sample: _____

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

- Low Concentration
- High Concentration

SAMPLING DATA:

Date:	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time:	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	
<u>8/29/07</u>								
<u>0920</u>								
Method: <u>peristaltic</u>								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
<u>8/30/07</u>								
Method: <u>peristaltic</u>	<u>Initial</u>	<u>6.7</u>	<u>19</u>	<u>23.1</u>	<u>180</u>	<u>2.3</u>	<u>0.0</u>	<u>-81</u>
Monitor Reading (ppm): <u>0</u>	<u>1st</u>	<u>6.3</u>	<u>16</u>	<u>22.7</u>	<u>230</u>	<u>0.5</u>	<u>0.0</u>	<u>-67</u>
Well Casing Diameter & Material	<u>2nd</u>	<u>5.9</u>	<u>11</u>	<u>22.6</u>	<u>77</u>	<u>0.5</u>	<u>0.0</u>	<u>-26</u>
Type: <u>1" PVC</u>	<u>3rd</u>	<u>5.9</u>	<u>11</u>	<u>22.6</u>	<u>95</u>	<u>0.5</u>	<u>0.0</u>	<u>-21</u>
Total Well Depth (TD): <u>38.96</u>								
Static Water Level (WL): <u>3.78</u>								
One Casing Volume(gal/L): <u>1.4</u>								
Start Purge (hrs): <u>0815</u>								
End Purge (hrs): <u>0910</u>								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

**This well did not clear up during development.*

Circle if Applicable:

<input type="checkbox"/> MS/MSD	Duplicate ID No.: _____
---------------------------------	-------------------------

Signature(s):



GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NCBC Gulfport
Project No.: 112G00464

Sample ID No.: GPT-03-29GW-001

Sample Location: GPT-03-29

Sampled By: JIS

C.O.C. No.: _____

Type of Sample: _____

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

- Low Concentration
- High Concentration

SAMPLING DATA:

Date: <u>8/30/07</u>	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Time: <u>12:30</u>	(Visual)	(S.U.)	(mS/cm)	(°C)	(NTU)	(mg/l)	(%)	
Method: <u>peristaltic</u>								

PURGE DATA:

ORD

Date: <u>8/30/07</u>	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: <u>peristaltic</u>	Initial	6.4	26	24.2	42	3.9	0.0	<120
Monitor Reading (ppm): <u>0</u>	1st	5.6	20	23.2	98	0.8	0.0	-9
Well Casing Diameter & Material	2nd	5.5	20	23.2	88	0.8	0.0	-4
Type: <u>1" PVC</u>	3rd	5.6	21	23.5	8.98	1.2	0.0	-8
Total Well Depth (TD): <u>29.51</u>								
Static Water Level (WL): <u>4.55</u>								
One Casing Volume(gal/L): <u>99</u>								
Start Purge (hrs): <u>1143</u>								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:



GROUNDWATER SAMPLE LOG SHEET

Project Site Name: _____
 Project No.: _____

Domestic Well Data
 Monitoring Well Data
 Other Well Type: _____
 QA Sample Type: _____

Sample ID No.: _____
 Sample Location: GPT-03-80
 Sampled By: _____
 C.O.C. No.: _____
 Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date:	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Time: <u>1125</u>								
Method:								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:	<u>Intake</u>	<u>6.0</u>	<u>15</u>	<u>24.2</u>	<u>24</u>	<u>1.6</u>	<u>0.0</u>	<u>-41</u>
Monitor Reading (ppm):	<u>1st</u>	<u>5.8</u>	<u>15</u>	<u>22.8</u>	<u>20</u>	<u>0.9</u>	<u>0.0</u>	<u>-45</u>
Well Casing Diameter & Material Type:	<u>2nd</u>	<u>5.8</u>	<u>14</u>	<u>22.7</u>	<u>26</u>	<u>0.7</u>	<u>0.0</u>	<u>-48</u>
	<u>3rd</u>	<u>5.9</u>	<u>14</u>	<u>22.7</u>	<u>26</u>	<u>0.7</u>	<u>0.0</u>	<u>-50</u>
Total Well Depth (TD): <u>39.43</u>								
Static Water Level (WL): <u>4.13</u>								
One Casing Volume(gal/L): <u>1.4</u>								
Start Purge (hrs): <u>1050</u>								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

400 mL/min.

Circle if Applicable:

<input type="checkbox"/> MS/MSD	<input type="checkbox"/> Duplicate ID No.:
---------------------------------	--

Signature(s): _____



GROUNDWATER SAMPLE LOG SHEET

Project Site Name: _____
Project No.: _____

Sample ID No.: _____
Sample Location: GPT-03-21

- Domestic Well Data
- Monitoring Well Data
- Other Well Type: _____
- QA Sample Type: _____

Sampled By: _____
C.O.C. No.: _____
Type of Sample:
 Low Concentration
 High Concentration

SAMPLING DATA:

Date:	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Time: <u>0955</u>								
Method:								

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:	<u>Initial</u>	<u>7.13</u>	<u>35</u>	<u>23.6</u>	<u>22</u>	<u>1.5</u>	<u>0.0</u>	<u>-149</u>
Monitor Reading (ppm):	<u>1st</u>	<u>7.15</u>	<u>47</u>	<u>23.2</u>	<u>52</u>	<u>0.7</u>	<u>0.0</u>	<u>-163</u>
Well Casing Diameter & Material	<u>2nd.</u>	<u>7.14</u>	<u>38</u>	<u>22.8</u>	<u>78</u>	<u>0.5</u>	<u>0.0</u>	<u>-161</u>
Type:	<u>3rd</u>	<u>7.13</u>	<u>52</u>	<u>22.6</u>	<u>69</u>	<u>0.5</u>	<u>0.0</u>	<u>-158</u>
Total Well Depth (TD): <u>49.64</u>								
Static Water Level (WL): <u>2.34</u>								
One Casing Volume (gal): <u>1.9</u>								
Start Purge (hrs): <u>0930</u>								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

400mL/min

Circle if Applicable:

Signature(s):

MS/MSD	Duplicate ID No.:
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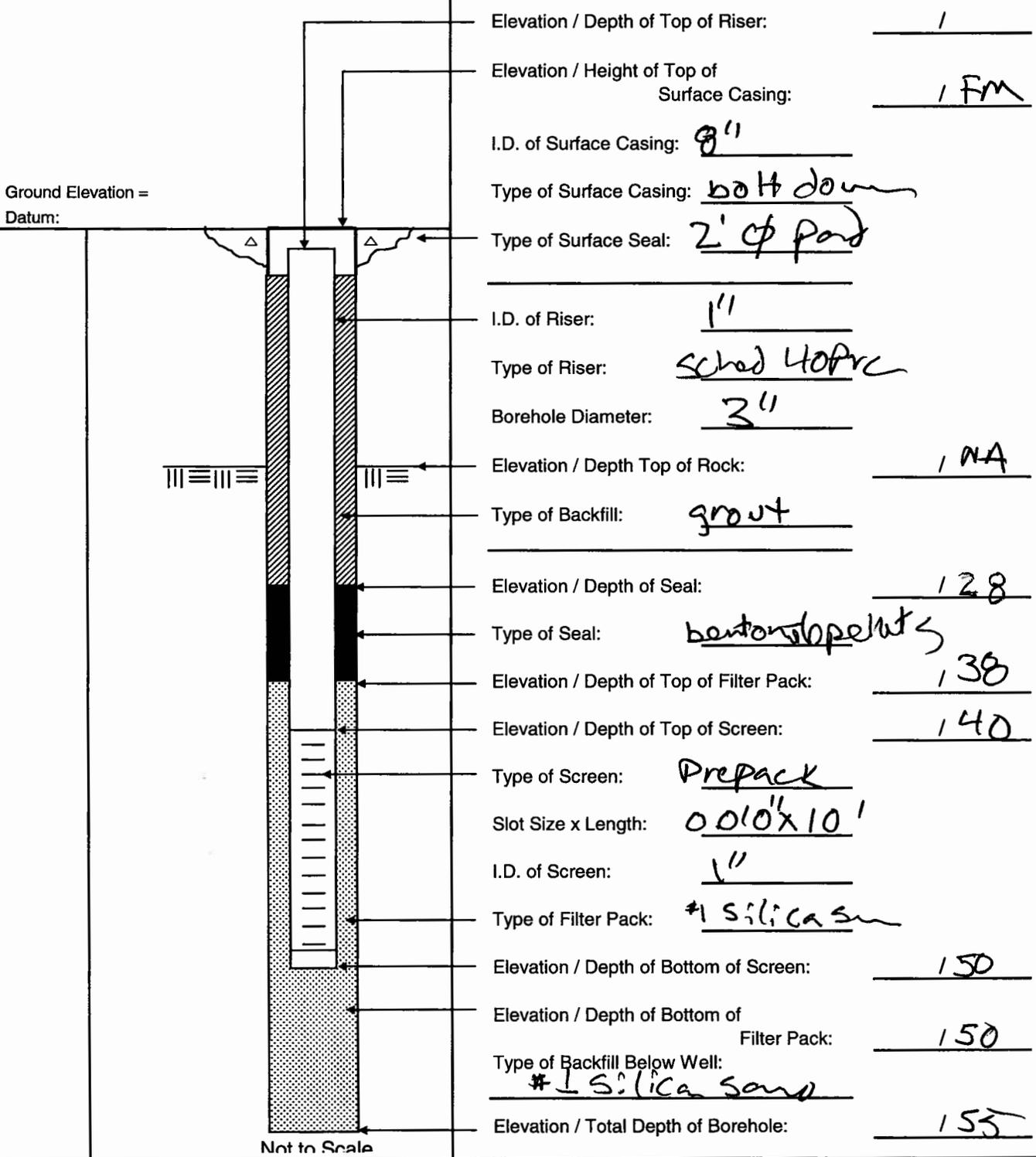
Tetra Tech NUS, Inc.

WELL No.:

GPT-03-31

MONITORING WELL SHEET

PROJECT: GPT R1 DRILLING Co.: mfw BORING No.: _____
 PROJECT No.: _____ DRILLER: D. Duncan DATE COMPLETED: 8-17-07
 SITE: 3 DRILLING METHOD: DPT-Casing NORTHING: _____
 GEOLOGIST: W.A. Olson DEV. METHOD: _____ EASTING: _____



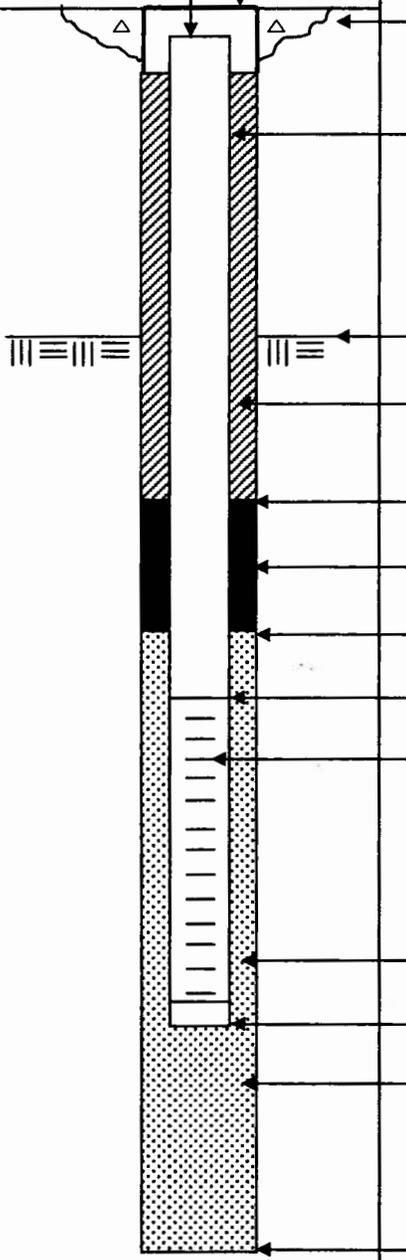


MONITORING WELL SHEET

PROJECT: GPT R1 DRILLING Co.: M P W BORING No.: _____
 PROJECT No.: _____ DRILLER: D. Duncan DATE COMPLETED: ~~8/10/07~~ 8/10/08
 SITE: 3 DRILLING METHOD: DPT-Casing NORTHING: _____
 GEOLOGIST: W, D. Olson DEV. METHOD: _____ EASTING: _____

	Elevation / Depth of Top of Riser:	<u>1</u>
	Elevation / Height of Top of Surface Casing:	<u>17M</u>
	I.D. of Surface Casing:	<u>8"</u>
	Type of Surface Casing:	<u>Bolt down</u>
	Type of Surface Seal:	<u>2' ϕ pad</u>
	I.D. of Riser:	<u>1"</u>
	Type of Riser:	<u>Sched 40 PVC</u>
	Borehole Diameter:	<u>3"</u>
	Elevation / Depth Top of Rock:	<u>N/A</u>
	Type of Backfill:	<u>grout</u>
	Elevation / Depth of Seal:	<u>129</u>
	Type of Seal:	<u>Bentonite pellets</u>
	Elevation / Depth of Top of Filter Pack:	<u>133</u>
	Elevation / Depth of Top of Screen:	<u>135</u>
	Type of Screen:	<u>Sched 40 prepack</u>
	Slot Size x Length:	<u>0.010" x 5'</u>
	I.D. of Screen:	<u>1"</u>
	Type of Filter Pack:	<u>#1 Silica Sand</u>
	Elevation / Depth of Bottom of Screen:	<u>140</u>
	Elevation / Depth of Bottom of Filter Pack:	<u>140</u>
	Type of Backfill Below Well:	<u>N/A</u>
	Elevation / Total Depth of Borehole:	<u>140</u>

Ground Elevation = Datum:



Not to Scale



MONITORING WELL SHEET

PROJECT: Site 3 R1 DRILLING Co.: MPW BORING No.: #29
 PROJECT No.: 1126 DRILLER: D. Dunlop DATE COMPLETED: 20/10/07
 SITE: 3 DRILLING METHOD: DPT-Casing NORTHING: _____
 GEOLOGIST: W.D. [Signature] DEV. METHOD: _____ EASTING: _____

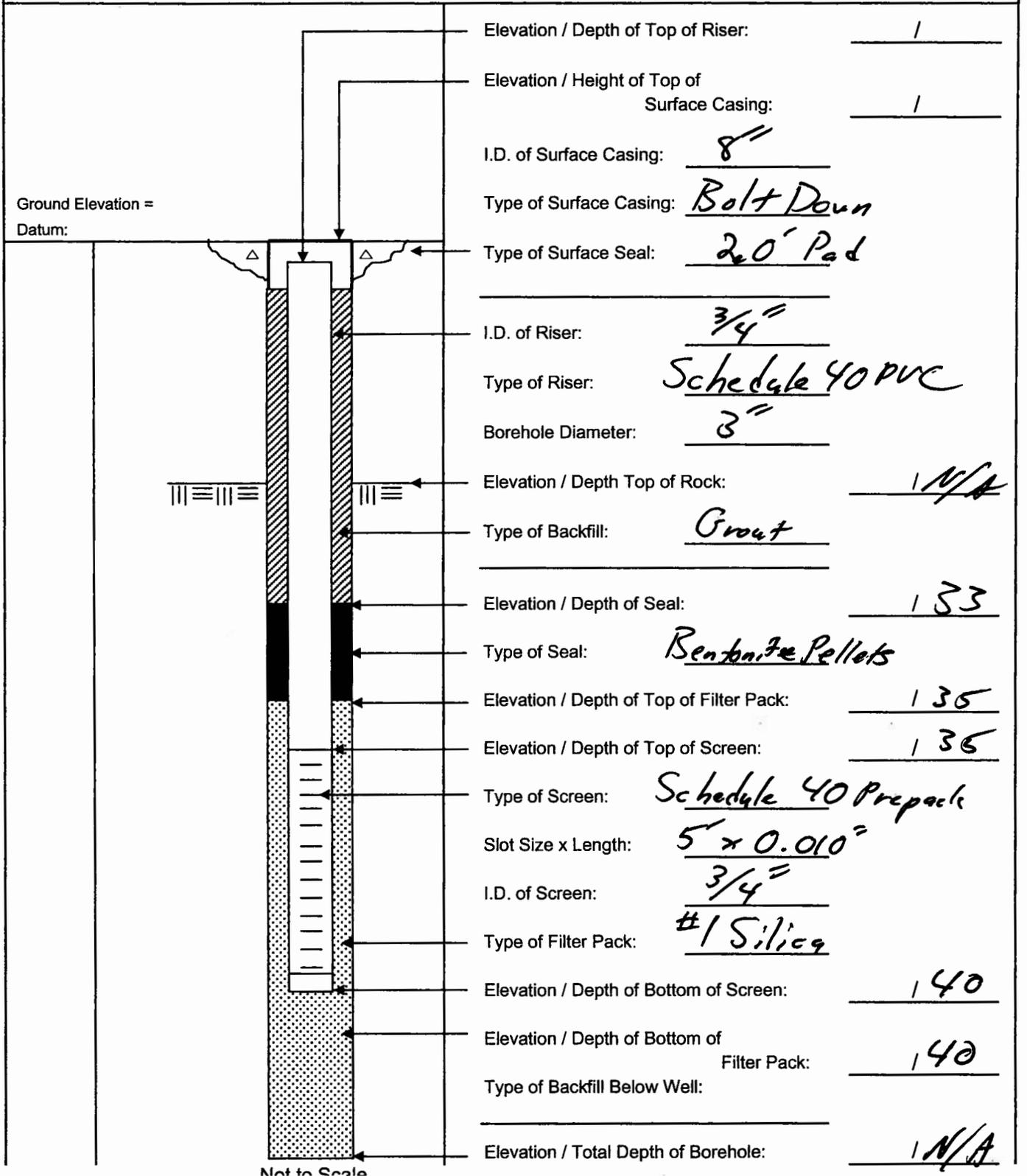
	Elevation / Depth of Top of Riser:	<u>1</u>
	Elevation / Height of Top of Surface Casing:	<u>1 FM</u>
	I.D. of Surface Casing:	<u>8"</u>
	Type of Surface Casing:	<u>bolt down</u>
	Type of Surface Seal:	<u>2' φ PVC</u>
	I.D. of Riser:	<u>1"</u>
	Type of Riser:	<u>Sched 40 PVC</u>
	Borehole Diameter:	<u>3"</u>
	Elevation / Depth Top of Rock:	<u>NA</u>
	Type of Backfill:	<u>grout</u>
	Elevation / Depth of Seal:	<u>114'</u>
	Type of Seal:	<u>bentonite pellets</u>
	Elevation / Depth of Top of Filter Pack:	<u>118'</u>
	Elevation / Depth of Top of Screen:	<u>120'</u>
	Type of Screen:	<u>Sched 40 Pre-pack</u>
Slot Size x Length:	<u>0.010' x 10'</u>	
I.D. of Screen:	<u>1"</u>	
Type of Filter Pack:	<u>#15 silica sand</u>	
Elevation / Depth of Bottom of Screen:	<u>130'</u>	
Elevation / Depth of Bottom of Filter Pack:	<u>130'</u>	
Type of Backfill Below Well:	<u>NA</u>	
Elevation / Total Depth of Borehole:	<u>130'</u>	

Not to Scale



MONITORING WELL SHEET

PROJECT: GPT-Site3 DRILLING Co.: Mow BORING No.: #28
 PROJECT No.: 112600464 DRILLER: Dave Duncan DATE COMPLETED: 8-16-07
 SITE: Site 3 DRILLING METHOD: DPT NORTHING: _____
 GEOLOGIST: _____ DEV. METHOD: _____ EASTING: _____



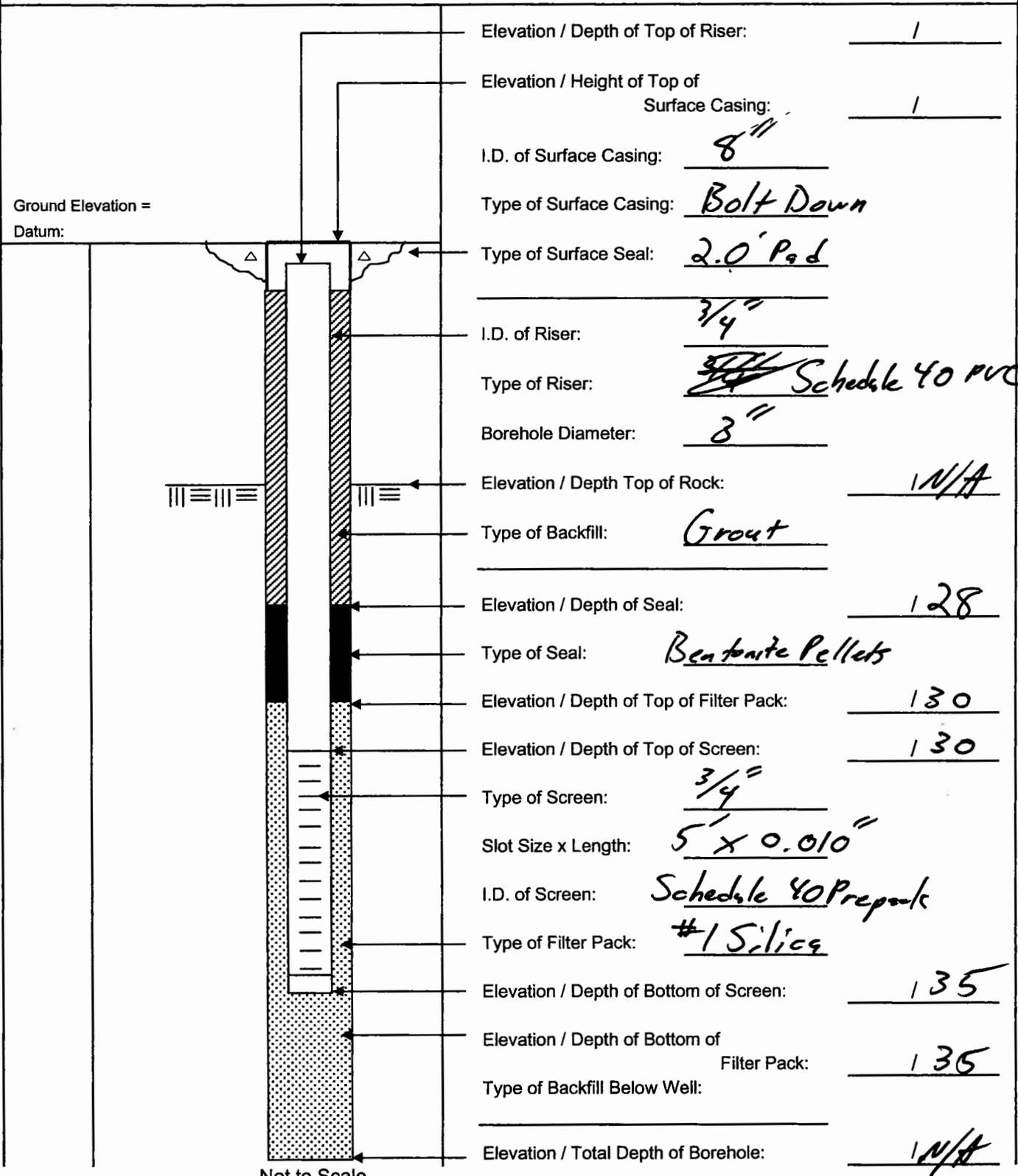


Tetra Tech NUS, Inc.

WELL No.: GPT-03-27

MONITORING WELL SHEET

PROJECT: GPT-Site 3 DRILLING Co.: M&W BORING No.: #27
 PROJECT No.: 112600464 DRILLER: Dave Duncan DATE COMPLETED: 8/16/07
 SITE: Site 3 DRILLING METHOD: DPT NORTHING: _____
 GEOLOGIST: _____ DEV. METHOD: _____ EASTING: _____





Tetra Tech NUS, Inc.

WELL No.: GPT-03-26

MONITORING WELL SHEET

PROJECT: GPT-Site 3 DRILLING Co.: M&W BORING No.: # 26
 PROJECT No.: 12 G00464 DRILLER: Dave Duncan DATE COMPLETED: 8/16/07
 SITE: Site 3 DRILLING METHOD: OPT NORTHING: _____
 GEOLOGIST: _____ DEV. METHOD: _____ EASTING: _____

	Elevation / Depth of Top of Riser:	<u>1</u>
	Elevation / Height of Top of Surface Casing:	<u>1</u>
	I.D. of Surface Casing:	<u>8"</u>
	Type of Surface Casing:	<u>Bolt Down</u>
	Type of Surface Seal:	<u>2.0' Pad</u>
	I.D. of Riser:	<u>3/4"</u>
	Type of Riser:	<u>Schedule 40 PVC</u>
	Borehole Diameter:	<u>3"</u>
	Elevation / Depth Top of Rock:	<u>1 N/A</u>
	Type of Backfill:	<u>grout</u>
	Elevation / Depth of Seal:	<u>1 6</u>
	Type of Seal:	_____
	Elevation / Depth of Top of Filter Pack:	<u>1 8</u>
	Elevation / Depth of Top of Screen:	<u>1 10</u>
	Type of Screen:	<u>Schedule 40 Prepack</u>
Slot Size x Length:	<u>10' x 0.010"</u>	
I.D. of Screen:	<u>3/4"</u>	
Type of Filter Pack:	<u>#1 Silica</u>	
Elevation / Depth of Bottom of Screen:	<u>1 20</u>	
Elevation / Depth of Bottom of Filter Pack:	<u>1 20</u>	
Type of Backfill Below Well:	<u>N/A</u>	
Elevation / Total Depth of Borehole:	<u>1</u>	

Not to Scale



Tetra Tech NUS, Inc.

WELL No.:

GPT-03-25

MONITORING WELL SHEET

PROJECT: GPT-Site 3 DRILLING Co.: M+W BORING No.: #25
 PROJECT No.: 112G00464 DRILLER: Dave Duncanson DATE COMPLETED: 8/15/07
 SITE: Site 3 DRILLING METHOD: DPT NORTHING: _____
 GEOLOGIST: W.D.O DEV. METHOD: _____ EASTING: _____

	Elevation / Depth of Top of Riser:	<u>1</u>
	Elevation / Height of Top of Surface Casing:	<u>1</u>
	I.D. of Surface Casing:	<u>8"</u>
	Type of Surface Casing:	<u>Bolt down</u>
	Type of Surface Seal:	<u>2"Ø PVC</u> <u>FW</u>
	I.D. of Riser:	<u>3/4"</u>
	Type of Riser:	<u>Sched 40 PVC</u>
	Borehole Diameter:	<u>3"</u>
	Elevation / Depth Top of Rock:	<u>1NA</u>
	Type of Backfill:	<u>grout</u>
	Elevation / Depth of Seal:	<u>129'</u>
	Type of Seal:	<u>bentonite pellets</u>
	Elevation / Depth of Top of Filter Pack:	<u>138'</u> <u>35'</u>
	Elevation / Depth of Top of Screen:	<u>140'</u> <u>37.5'</u>
	Type of Screen:	<u>Sched 40 pre Pack</u>
Slot Size x Length:	<u>5' x 0.010"</u>	
I.D. of Screen:	<u>3/4"</u>	
Type of Filter Pack:	<u>#15 silica sand</u> <u>42.5'</u>	
Elevation / Depth of Bottom of Screen:	<u>145'</u> <u>WOOD</u>	
Elevation / Depth of Bottom of Filter Pack:	<u>42.5'</u> <u>145'</u> <u>WOOD</u>	
Type of Backfill Below Well:	<u>sand</u>	
Elevation / Total Depth of Borehole:	<u>150'</u>	

Not to Scale

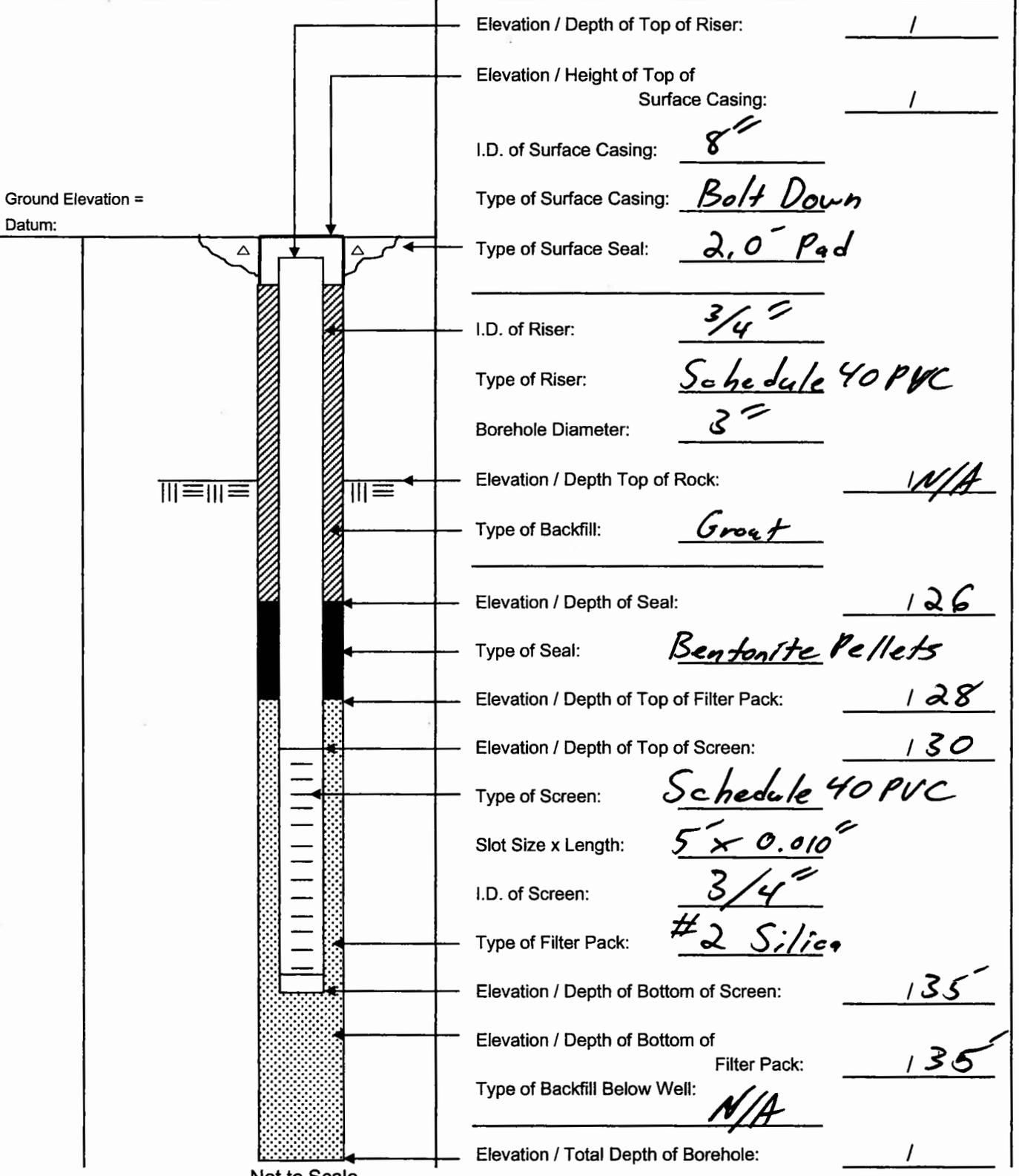


Tetra Tech NUS, Inc.

WELL No.: GPT-03-24

MONITORING WELL SHEET

PROJECT: GPT-Site3 DRILLING Co.: M&W BORING No.: #24
 PROJECT No.: 112600464 DRILLER: Dave Duncan DATE COMPLETED: 8/15/07
 SITE: Site3 DRILLING METHOD: DPT NORTHING: _____
 GEOLOGIST: _____ DEV. METHOD: _____ EASTING: _____



Elevation / Depth of Top of Riser: 1
 Elevation / Height of Top of Surface Casing: 1
 I.D. of Surface Casing: 8"
 Type of Surface Casing: Bolt Down
 Type of Surface Seal: 2.0' Pad
 I.D. of Riser: 3/4"
 Type of Riser: Schedule 40 PVC
 Borehole Diameter: 3"
 Elevation / Depth Top of Rock: N/A
 Type of Backfill: Groat
 Elevation / Depth of Seal: 126
 Type of Seal: Bentonite Pellets
 Elevation / Depth of Top of Filter Pack: 128
 Elevation / Depth of Top of Screen: 130
 Type of Screen: Schedule 40 PVC
 Slot Size x Length: 5' x 0.010"
 I.D. of Screen: 3/4"
 Type of Filter Pack: #2 Silica
 Elevation / Depth of Bottom of Screen: 135
 Elevation / Depth of Bottom of Filter Pack: 135
 Type of Backfill Below Well: N/A
 Elevation / Total Depth of Borehole: 1



Tetra Tech NUS, Inc.

WELL No.:

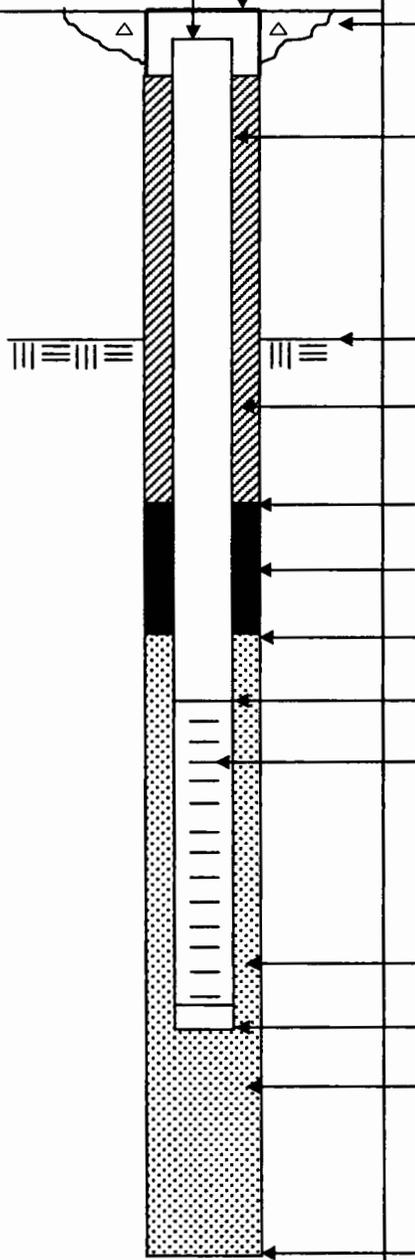
²³
~~GPT-03-24~~

MONITORING WELL SHEET

PROJECT: GPT-Site 3 DRILLING Co.: M&W BORING No.: #~~24~~²³
 PROJECT No.: 112G00464 DRILLER: Dave Duncan DATE COMPLETED: 8/15/07
 SITE: Site 3 DRILLING METHOD: DPT NORTHING: _____
 GEOLOGIST: _____ DEV. METHOD: _____ EASTING: _____

	Elevation / Depth of Top of Riser:	<u>1</u>
	Elevation / Height of Top of Surface Casing:	<u>1</u>
	I.D. of Surface Casing:	<u>8"</u>
	Type of Surface Casing:	<u>Bolt Down</u>
	Type of Surface Seal:	<u>2.0' Pad</u>
	I.D. of Riser:	<u>2 1/4"</u>
	Type of Riser:	<u>Schedule 40 PVC</u>
	Borehole Diameter:	<u>3"</u>
	Elevation / Depth Top of Rock:	<u>1 N/A</u>
	Type of Backfill:	<u>Grout</u>
	Elevation / Depth of Seal:	<u>1 9</u>
	Type of Seal:	<u>Bentonite Pellets</u>
	Elevation / Depth of Top of Filter Pack:	<u>1 18</u>
	Elevation / Depth of Top of Screen:	<u>1 20</u>
	Type of Screen:	<u>Schedule 40 Prepack</u>
	Slot Size x Length:	<u>10' x 0.010"</u>
	I.D. of Screen:	<u>2 1/4"</u>
	Type of Filter Pack:	<u>#2 Silica</u>
	Elevation / Depth of Bottom of Screen:	<u>1 30'</u>
	Elevation / Depth of Bottom of Filter Pack:	<u>1 30'</u>
	Type of Backfill Below Well:	<u>N/A</u>
	Elevation / Total Depth of Borehole:	<u>1</u>

Ground Elevation = Datum:



Not to Scale

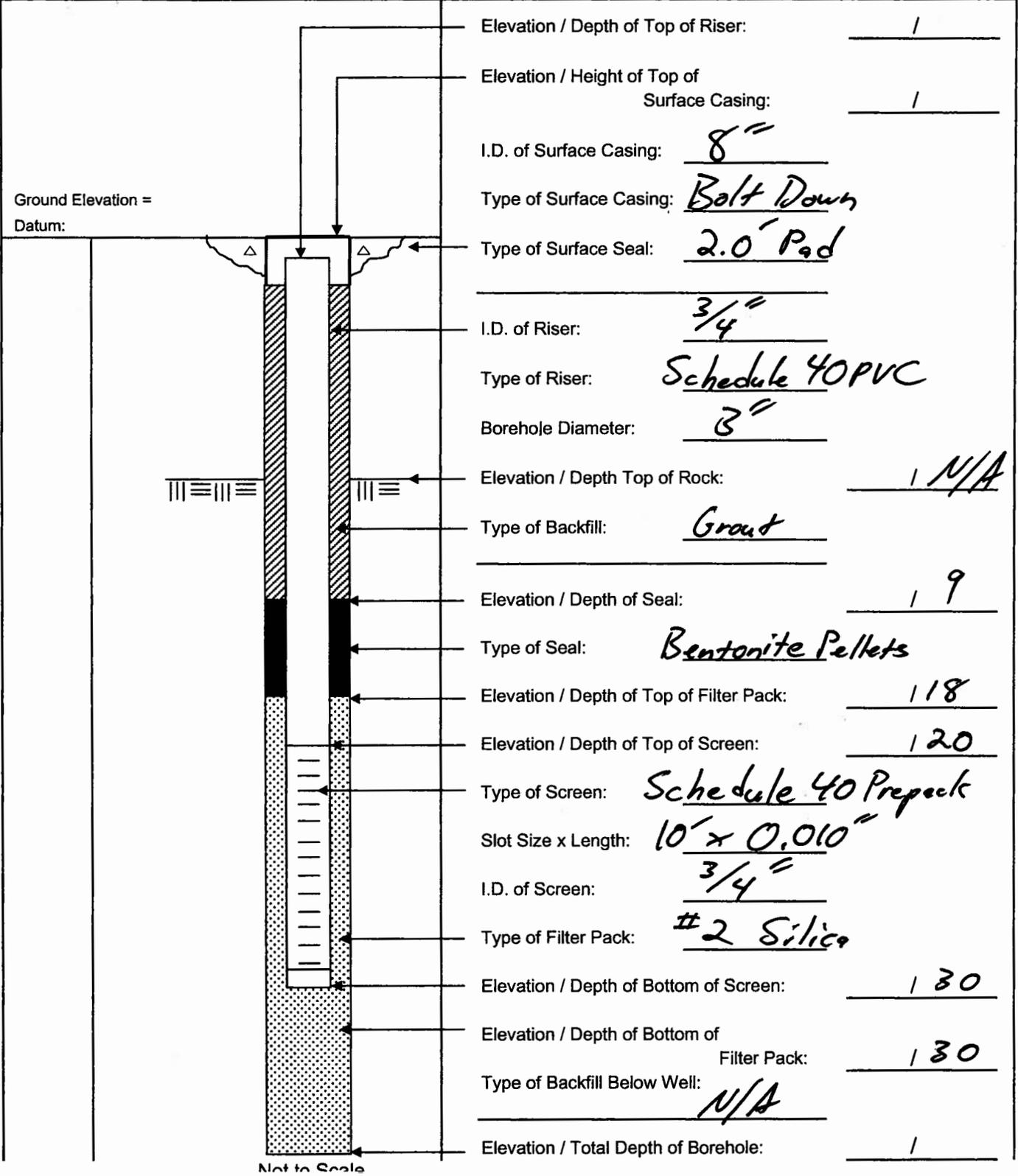


Tetra Tech NUS, Inc.

WELL No.: GPT-03-22

MONITORING WELL SHEET

PROJECT: GPT-Site3 DRILLING Co.: M&W BORING No.: #22
 PROJECT No.: 112G00464 DRILLER: Dave Duncan DATE COMPLETED: 8/15/07
 SITE: Site3 DRILLING METHOD: DPT NORTHING: _____
 GEOLOGIST: _____ DEV. METHOD: _____ EASTING: _____



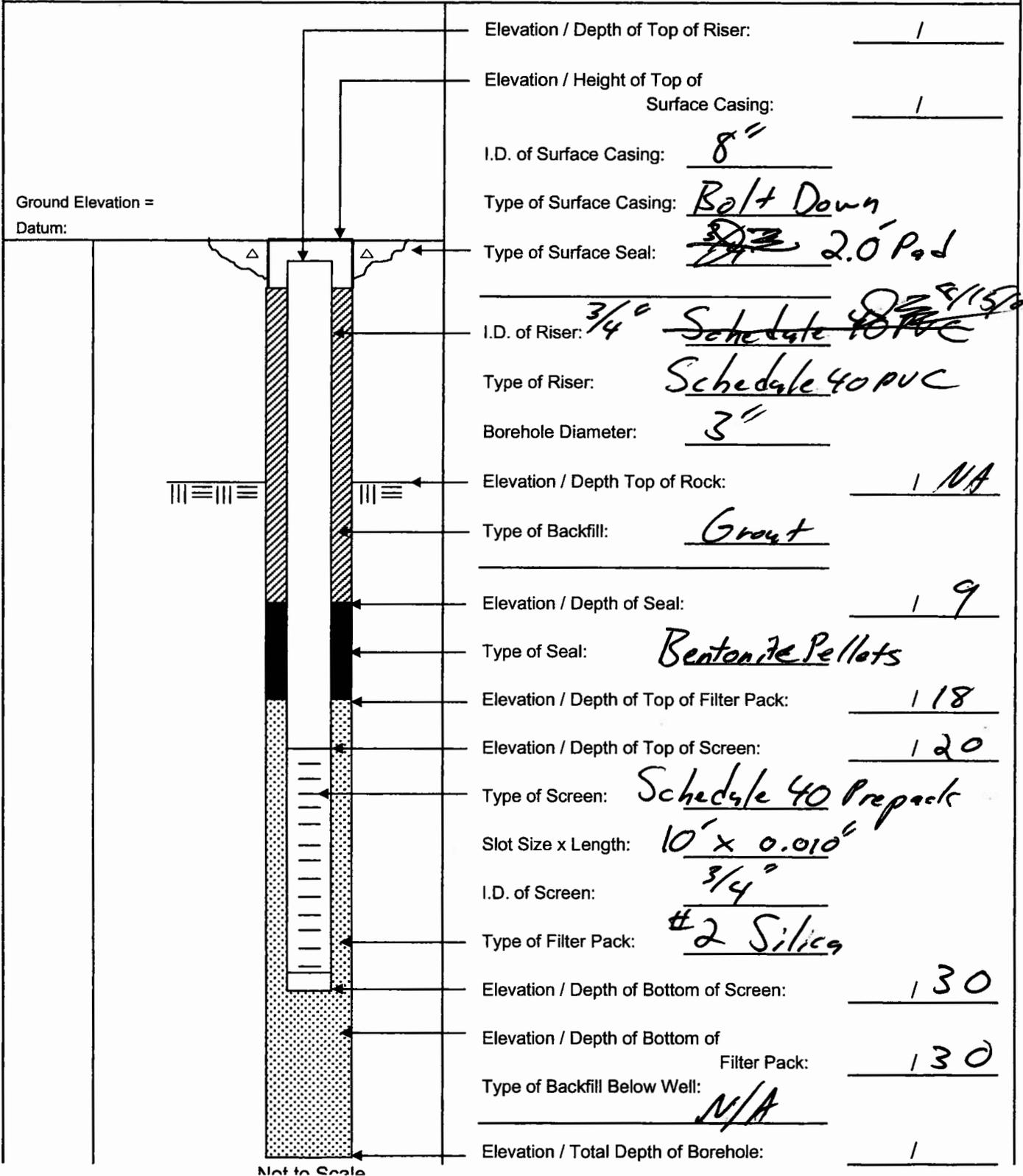


Tetra Tech NUS, Inc.

WELL No.: GPT-02-21

MONITORING WELL SHEET

PROJECT: GPT-Site 3 DRILLING Co.: M+W BORING No.: #21
 PROJECT No.: 112G00464 DRILLER: Dave Duncan DATE COMPLETED: 8/15/07
 SITE: Site 3 DRILLING METHOD: DPT NORTHING: _____
 GEOLOGIST: _____ DEV. METHOD: _____ EASTING: _____



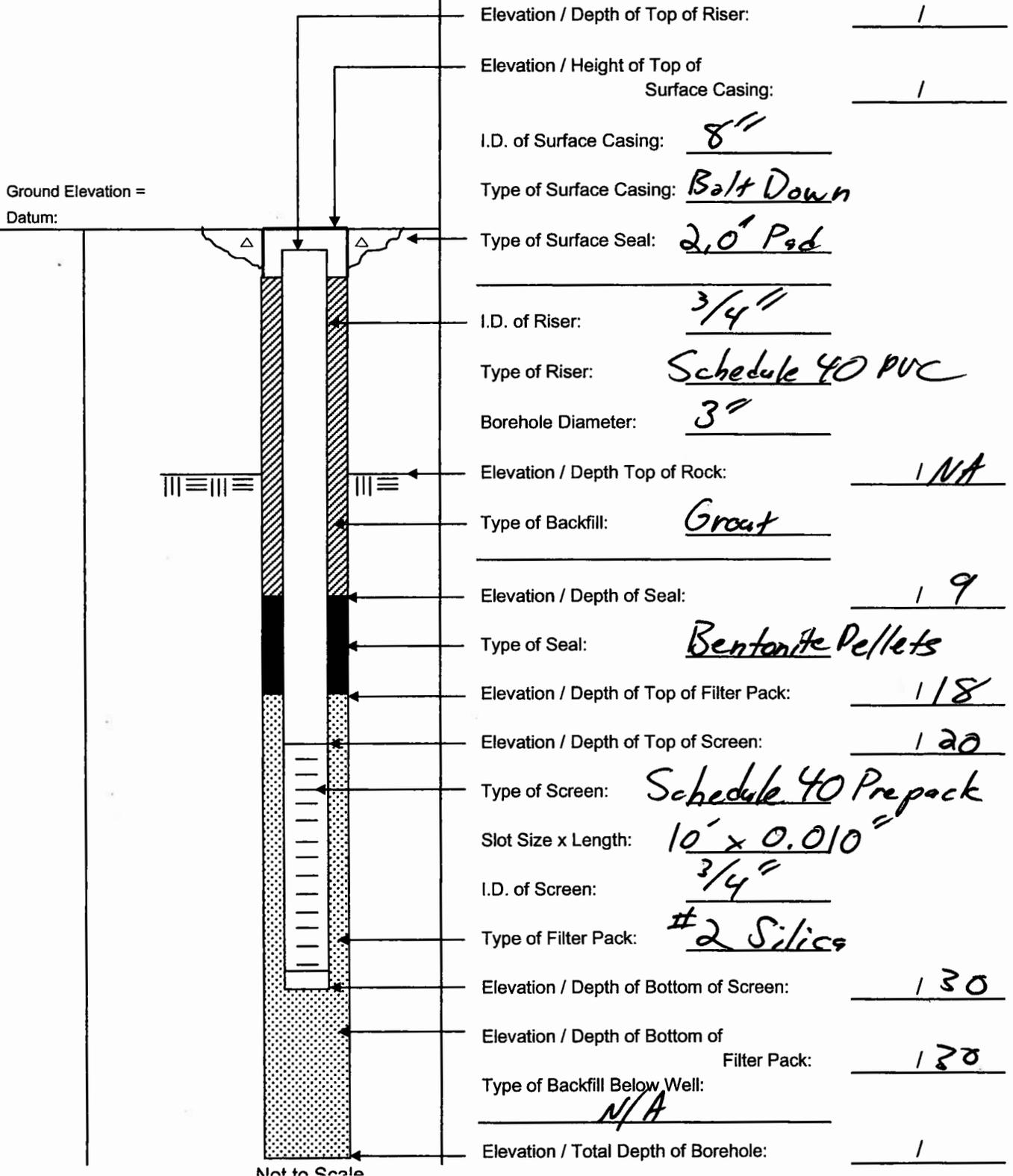


Tetra Tech NUS, Inc.

WELL No.: GPT-03-MW20

MONITORING WELL SHEET

PROJECT: GPT-Site 3 DRILLING Co.: M&W BORING No.: #20
 PROJECT No.: N00464 DRILLER: Dave Duncan DATE COMPLETED: 8/14/07
 SITE: Site 3 DRILLING METHOD: DPT NORTHING: _____
 GEOLOGIST: _____ DEV. METHOD: _____ EASTING: _____



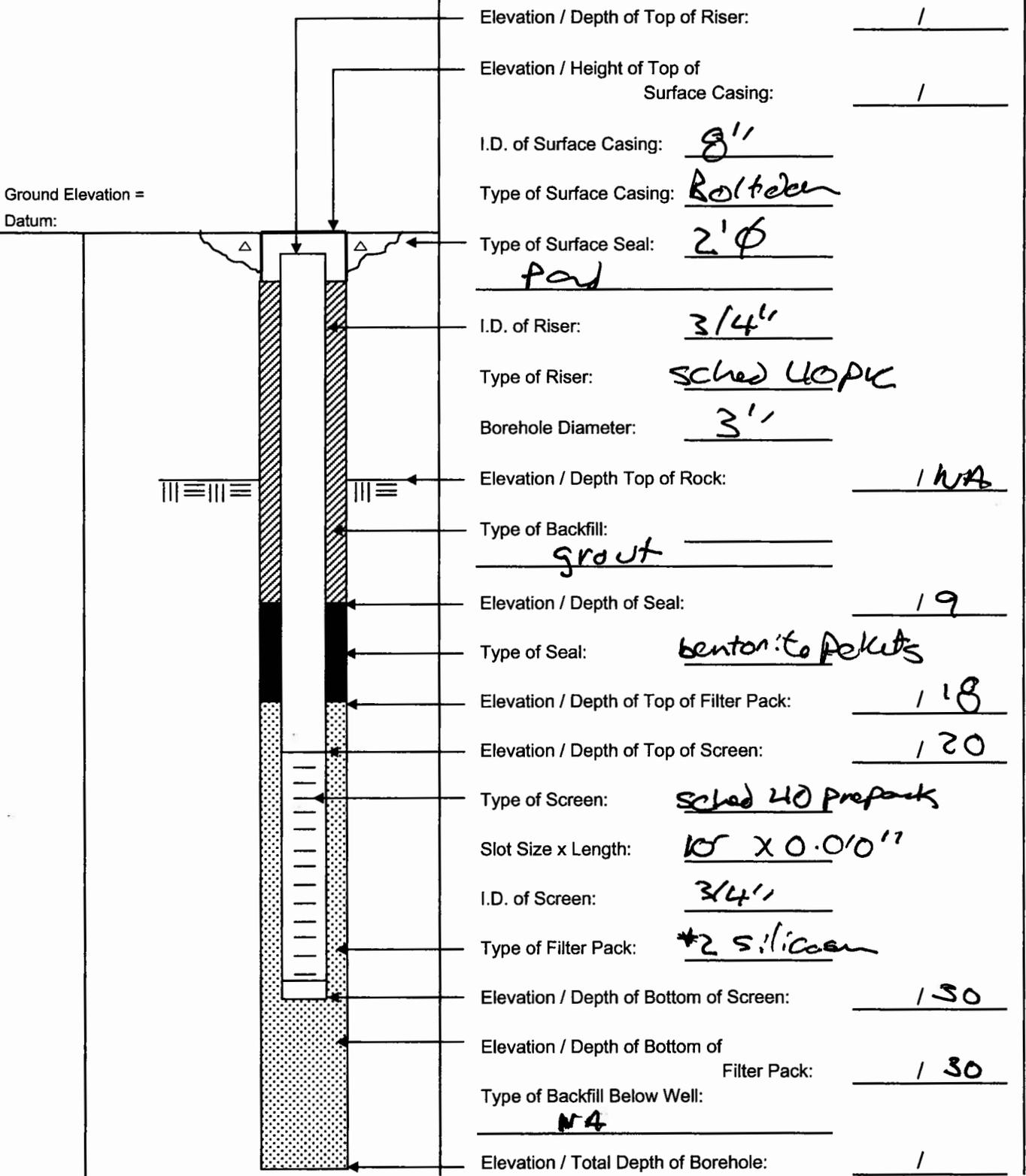


Tetra Tech NUS, Inc.

WELL No.: GPT-03-MW19

MONITORING WELL SHEET

PROJECT: GPT-Site 3 DRILLING Co.: M2W BORING No.: #19
 PROJECT No.: N00464 DRILLER: Dave Duncan DATE COMPLETED: 8/14/07
 SITE: Site 3 DRILLING METHOD: DPT NORTHING: _____
 GEOLOGIST: _____ DEV. METHOD: _____ EASTING: _____



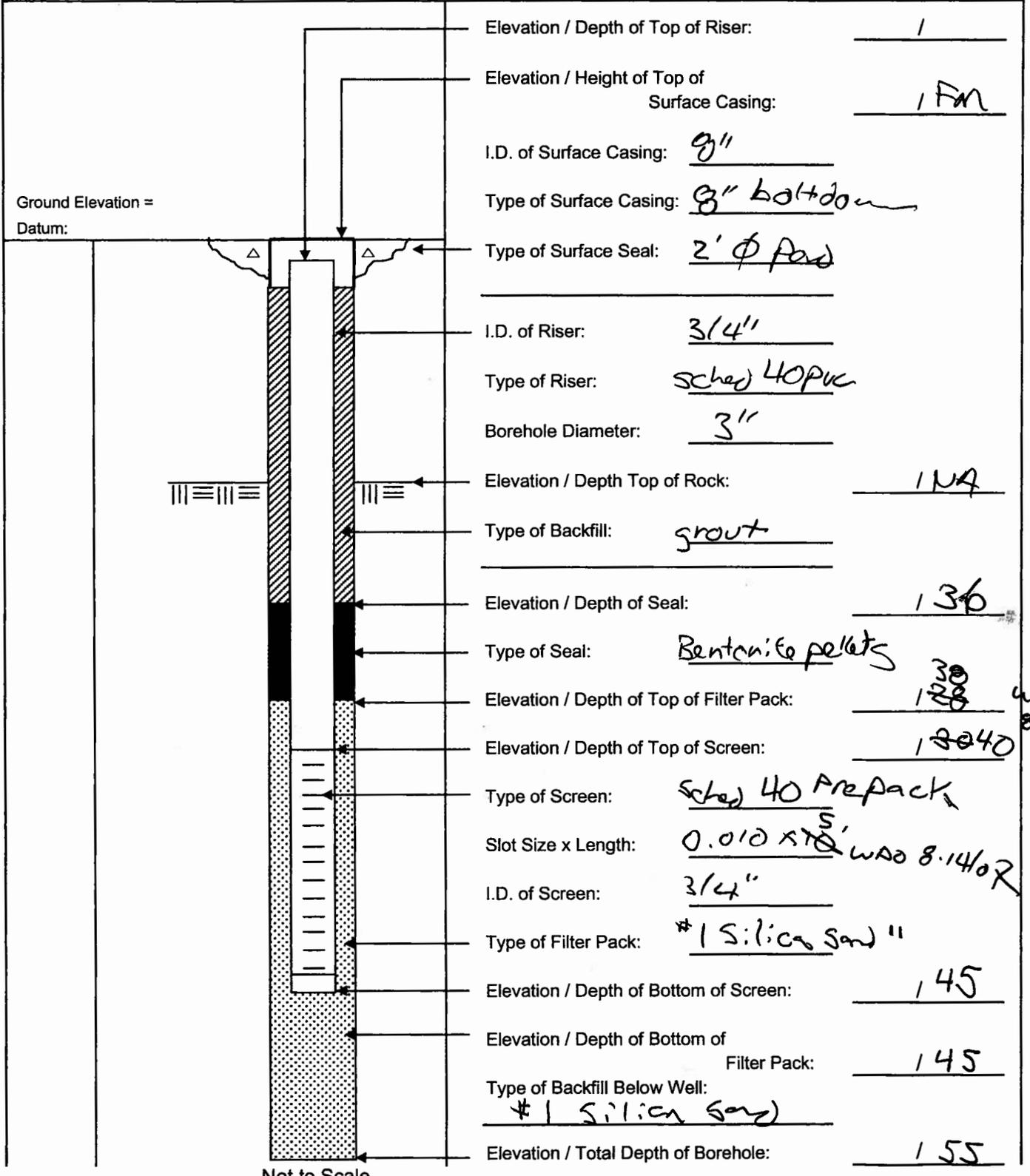


Tetra Tech NUS, Inc.

WELL No.: GPT-03-MW18

MONITORING WELL SHEET

PROJECT: GPT-Site 3 DRILLING Co.: M+W BORING No.: #18
 PROJECT No.: N00464 DRILLER: Dave Duncan DATE COMPLETED: 8/14/07
 SITE: Site 3 DRILLING METHOD: DPT NORTHING: _____
 GEOLOGIST: WAO DEV. METHOD: _____ EASTING: _____





Tetra Tech NUS, Inc.

WELL No.:

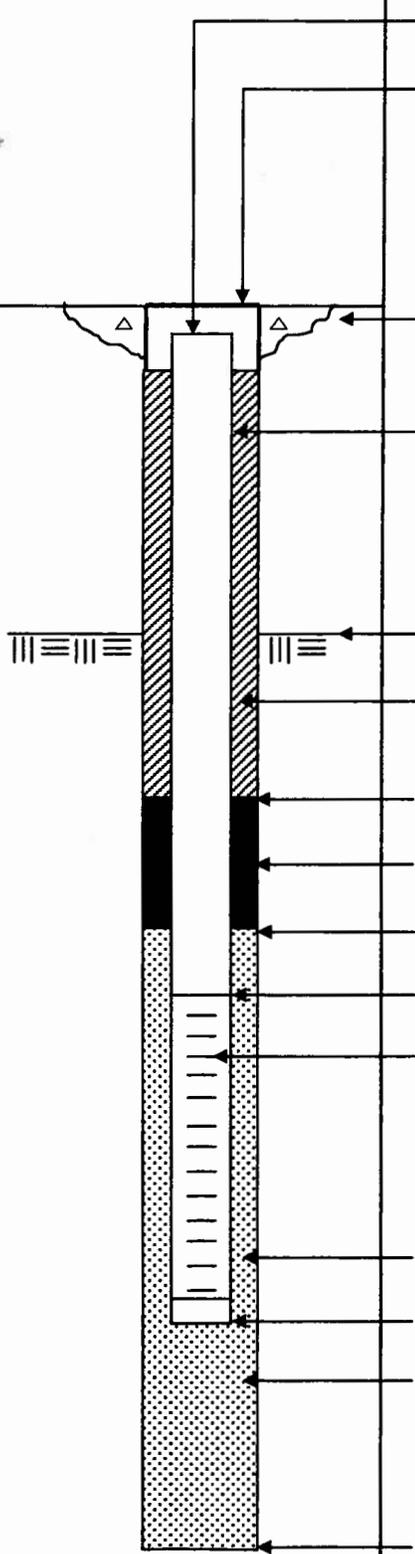
GPT-03-08

MONITORING WELL SHEET

PROJECT: GPT R1 DRILLING Co.: MFW BORING No.: _____
 PROJECT No.: 00474 DRILLER: B. Oats DATE COMPLETED: 6-26-07
 SITE: 3 DRILLING METHOD: HSA NORTHING: _____
 GEOLOGIST: W.A. Olson DEV. METHOD: _____ EASTING: _____

	Elevation / Depth of Top of Riser:	<u>1</u>
	Elevation / Height of Top of Surface Casing:	<u>1</u>
	I.D. of Surface Casing:	<u>8"</u>
	Type of Surface Casing:	<u>Bolt down</u>
	Type of Surface Seal:	<u>24" ϕ Concrete Pad</u>
	I.D. of Riser:	<u>24</u>
	Type of Riser:	<u>Sched 40 PVC</u>
	Borehole Diameter:	<u>8"</u>
	Elevation / Depth Top of Rock:	<u>1 NA</u>
	Type of Backfill:	<u>grout</u>
	Elevation / Depth of Seal:	<u>16</u>
	Type of Seal:	<u>bentonite chips</u>
	Elevation / Depth of Top of Filter Pack:	<u>18</u>
	Elevation / Depth of Top of Screen:	<u>110</u>
	Type of Screen:	<u>Pre Pack</u>
	Slot Size x Length:	<u>0.10 10'</u>
	I.D. of Screen:	<u>24</u>
	Type of Filter Pack:	<u>40/60 Sand</u> 20016
	Elevation / Depth of Bottom of Screen:	<u>120</u>
	Elevation / Depth of Bottom of Filter Pack:	<u>120</u>
	Type of Backfill Below Well:	<u>Natural</u>
	Elevation / Total Depth of Borehole:	<u>122</u>

Ground Elevation = Datum:

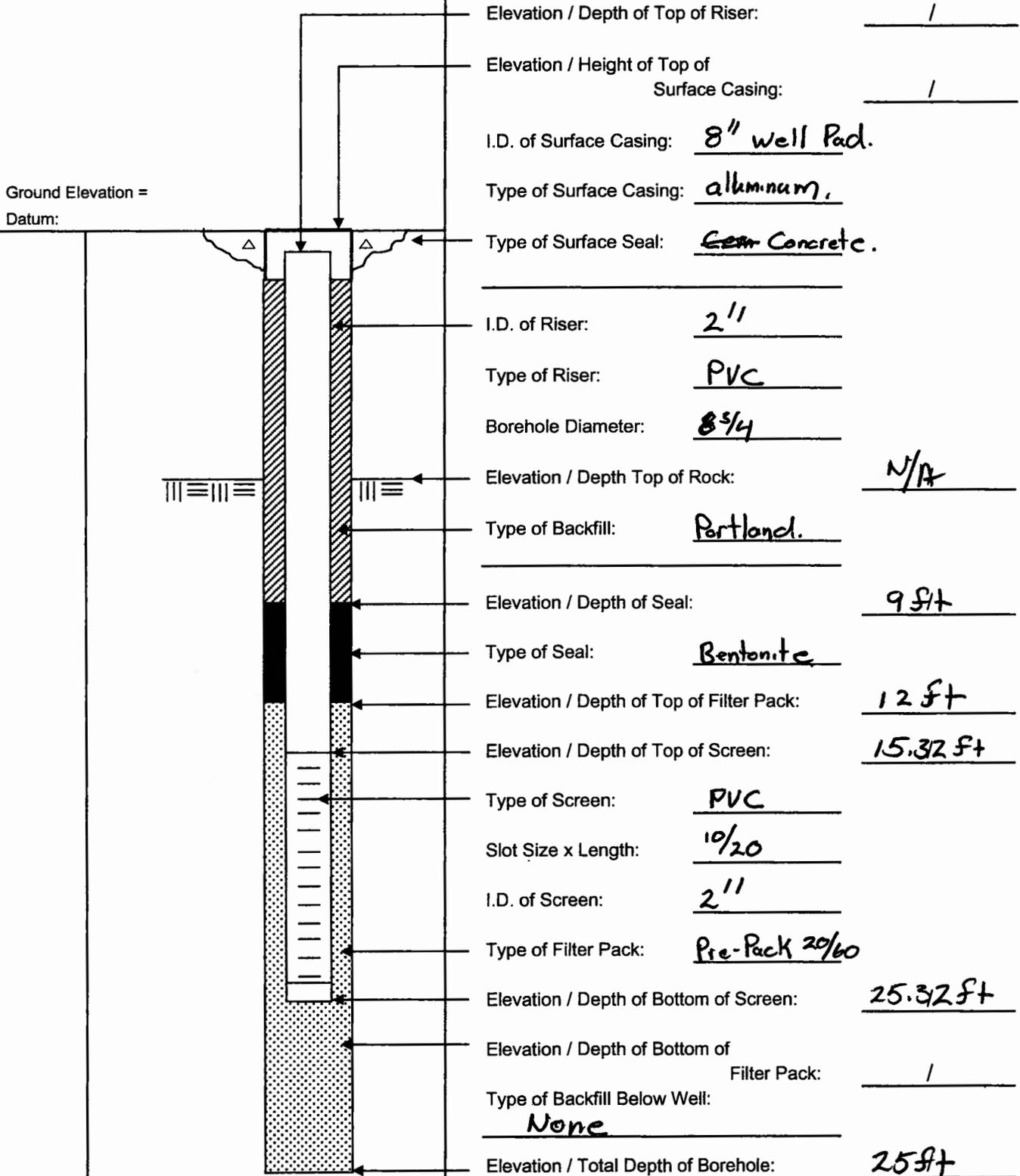


Not to Scale



MONITORING WELL SHEET

PROJECT: Stc3 RI DRILLING Co.: M&W BORING No.: 6PT-03-09
 PROJECT No.: CTO-041 DRILLER: Bill Oates DATE COMPLETED: 6-27-07
 SITE: 3. DRILLING METHOD: HSA NORTHING: _____
 GEOLOGIST: J.D. Spalding DEV. METHOD: Sub. EASTING: _____



Elevation / Depth of Top of Riser: 1
 Elevation / Height of Top of Surface Casing: 1
 I.D. of Surface Casing: 8" well Pad.
 Type of Surface Casing: aluminum.
 Type of Surface Seal: Gen Concrete.
 I.D. of Riser: 2"
 Type of Riser: PVC
 Borehole Diameter: 8 5/4
 Elevation / Depth Top of Rock: N/A
 Type of Backfill: Portland.
 Elevation / Depth of Seal: 9.5ft
 Type of Seal: Bentonite
 Elevation / Depth of Top of Filter Pack: 12.5ft
 Elevation / Depth of Top of Screen: 15.32ft
 Type of Screen: PVC
 Slot Size x Length: 10/20
 I.D. of Screen: 2"
 Type of Filter Pack: Pre-Pack 20/60
 Elevation / Depth of Bottom of Screen: 25.32ft
 Elevation / Depth of Bottom of Filter Pack: 1
 Type of Backfill Below Well: None
 Elevation / Total Depth of Borehole: 25ft

Not to Scale

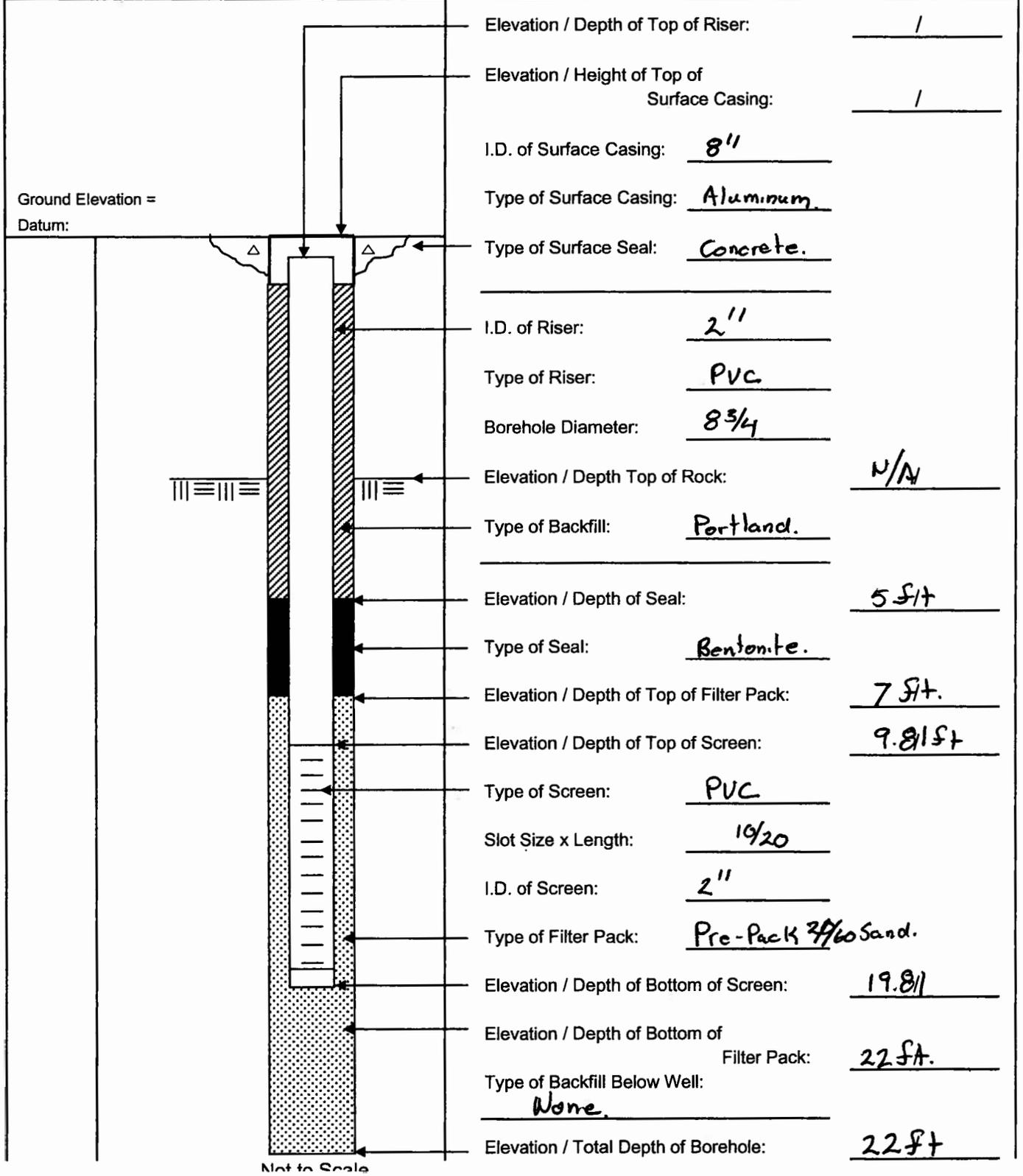


Tetra Tech NUS, Inc.

WELL No.: GPT-03-10

MONITORING WELL SHEET

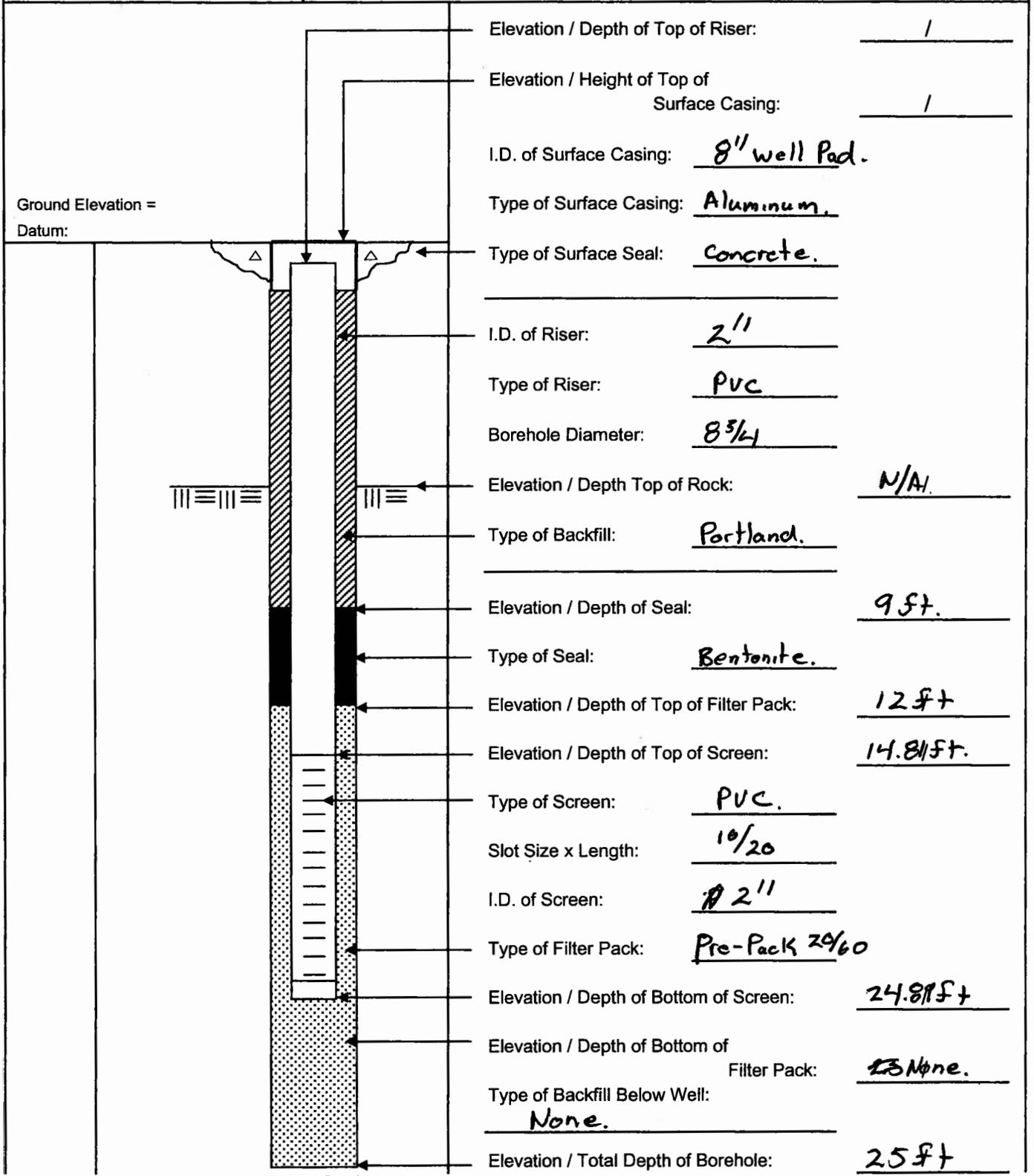
PROJECT: Site 3 RI DRILLING Co.: M3W BORING No.: GPT-03-10
 PROJECT No.: CTO-041 DRILLER: Bill Oates DATE COMPLETED: 6-27-07
 SITE: 3 DRILLING METHOD: HSA NORTHING: _____
 GEOLOGIST: J.D. Spalding DEV. METHOD: Sub. EASTING: _____





MONITORING WELL SHEET

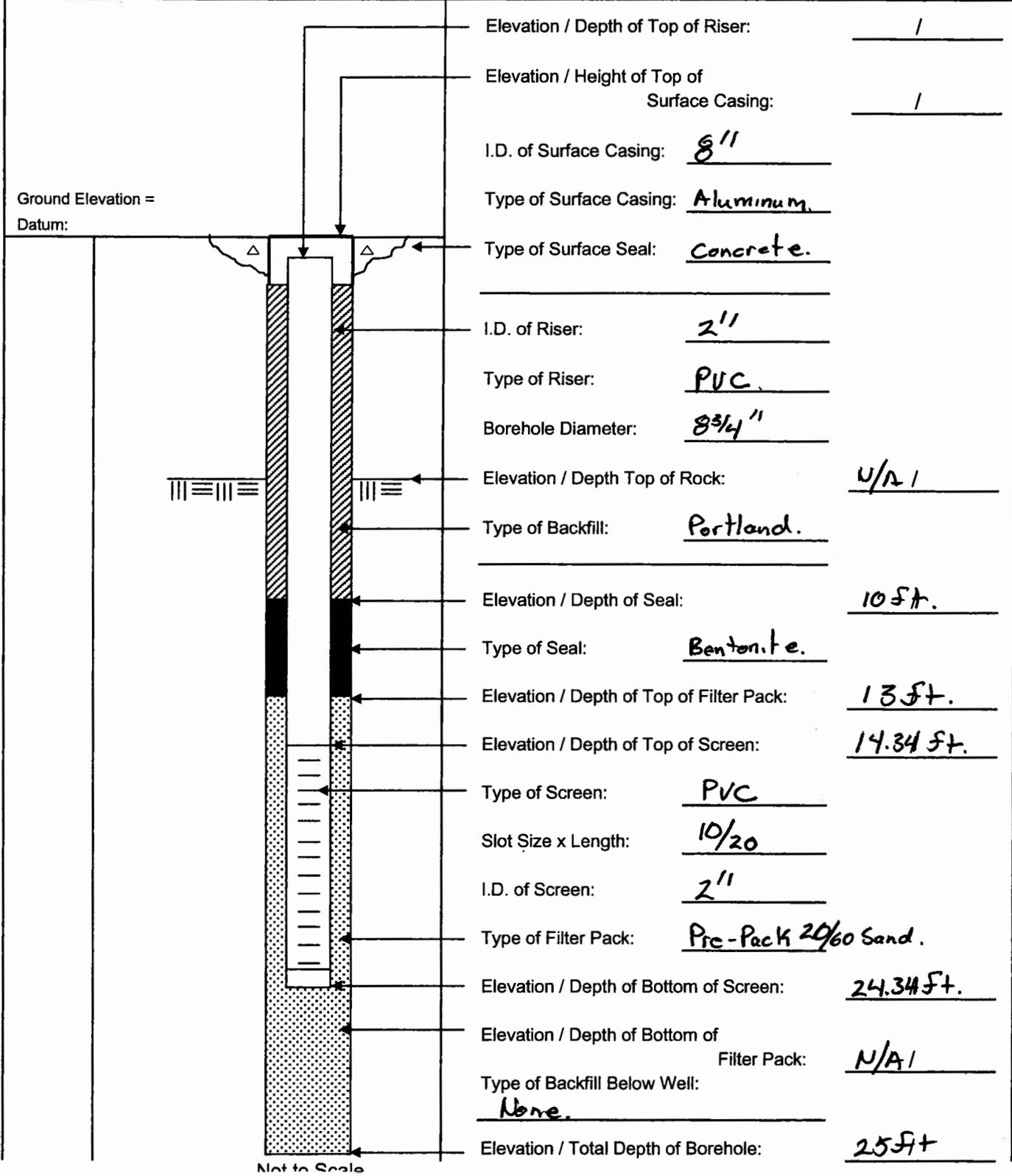
PROJECT: Site 3 RI DRILLING Co.: M3W BORING No.: 6PT-03-11
 PROJECT No.: CTO-041 DRILLER: Bill Oates DATE COMPLETED: 6-27-07
 SITE: 3 DRILLING METHOD: HSA NORTHING: _____
 GEOLOGIST: J.D. Spalding DEV. METHOD: Sub. EASTING: _____





MONITORING WELL SHEET

PROJECT: Site 3 RI DRILLING Co.: M3W BORING No.: GPT-03-12
 PROJECT No.: CTO-041 DRILLER: Billoates DATE COMPLETED: 6-28-07
 SITE: 3 DRILLING METHOD: HSA NORTHING: _____
 GEOLOGIST: J.D. Spalding DEV. METHOD: Sub. EASTING: _____





MONITORING WELL SHEET

PROJECT: Site 3 RI DRILLING Co.: M3W BORING No.: 6PT-08-13
 PROJECT No.: CTO-041 DRILLER: Bill Oates DATE COMPLETED: 6-28-07
 SITE: 3 DRILLING METHOD: ASA NORTHING: _____
 GEOLOGIST: J.D. Spalding DEV. METHOD: Sub. EASTING: _____

	Elevation / Depth of Top of Riser:	<u>1</u>
	Elevation / Height of Top of Surface Casing:	<u>1</u>
	I.D. of Surface Casing:	<u>8" well Pad.</u>
	Type of Surface Casing:	<u>Aluminum.</u>
	Type of Surface Seal:	<u>Concrete.</u>
	I.D. of Riser:	<u>2"</u>
	Type of Riser:	<u>PVC</u>
	Borehole Diameter:	<u>8 3/4</u>
	Elevation / Depth Top of Rock:	<u>N/A 1</u>
	Type of Backfill:	<u>Portland.</u>
	Elevation / Depth of Seal:	<u>15 ft.</u>
	Type of Seal:	<u>Bentonite.</u>
	Elevation / Depth of Top of Filter Pack:	<u>17 ft.</u>
	Elevation / Depth of Top of Screen:	<u>19.57 ft.</u>
	Type of Screen:	<u>PVC</u>
Slot Size x Length:	<u>1 1/2 x 20</u>	
I.D. of Screen:	<u>2"</u>	
Type of Filter Pack:	<u>Pre Pack 20/60 Sand.</u>	
Elevation / Depth of Bottom of Screen:	<u>29.57 ft</u>	
Elevation / Depth of Bottom of Filter Pack:	<u>N/A 1</u>	
Type of Backfill Below Well:	<u>None.</u>	
Elevation / Total Depth of Borehole:	<u>30 ft</u>	

Not to Scale

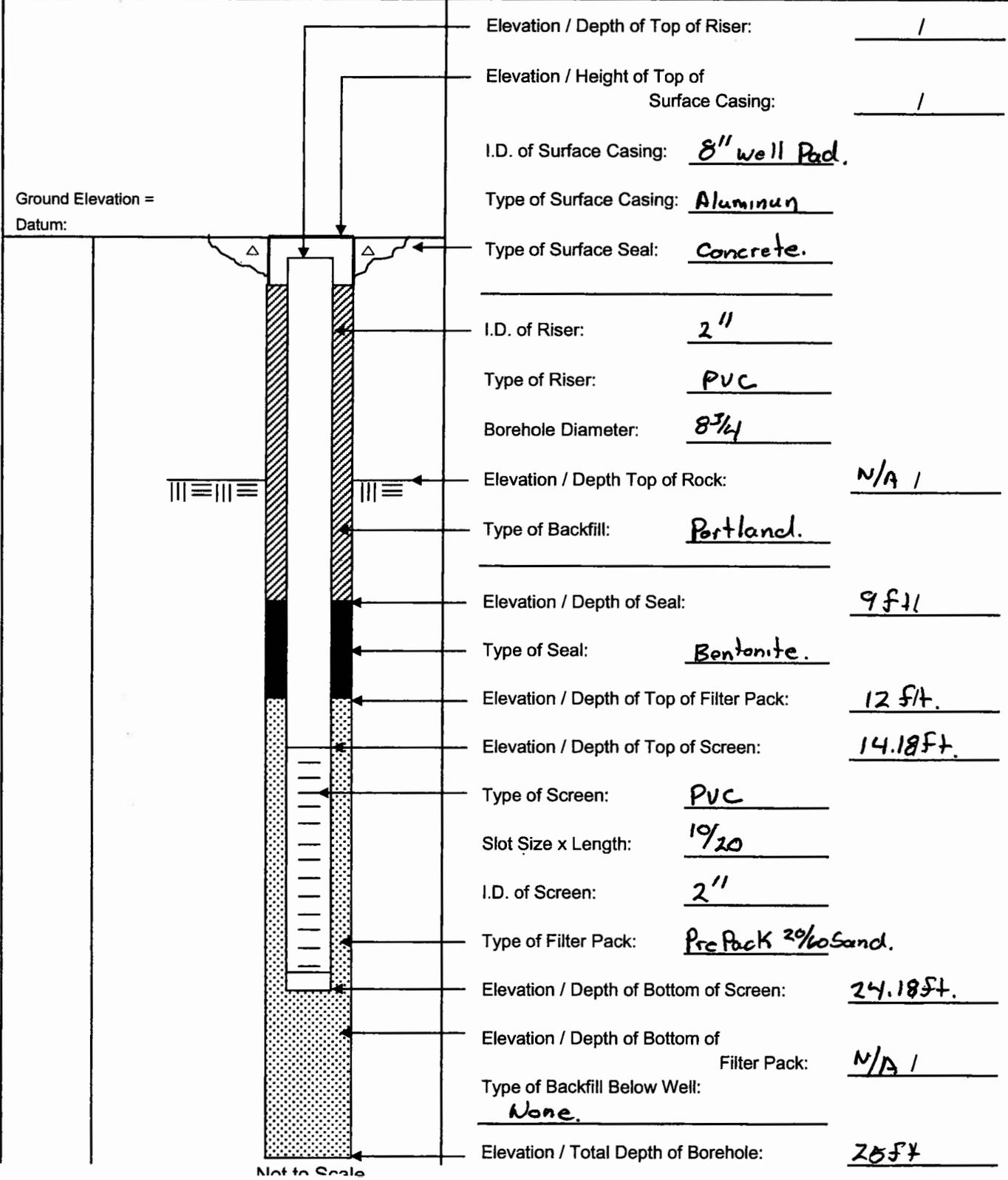


Tetra Tech NUS, Inc.

WELL No.: GPT-08-14

MONITORING WELL SHEET

PROJECT: Site 3 RF DRILLING Co.: M3W BORING No.: GPT-08-14
 PROJECT No.: CTO-041 DRILLER: Bill Oates DATE COMPLETED: 6-28-07
 SITE: 3 DRILLING METHOD: HSA NORTHING: _____
 GEOLOGIST: J.D. Spalding DEV. METHOD: Sub. EASTING: _____



Elevation / Depth of Top of Riser: 1
 Elevation / Height of Top of Surface Casing: 1
 I.D. of Surface Casing: 8" well Pad.
 Type of Surface Casing: Aluminum
 Type of Surface Seal: Concrete.
 I.D. of Riser: 2"
 Type of Riser: PVC
 Borehole Diameter: 8 3/4
 Elevation / Depth Top of Rock: N/A
 Type of Backfill: Portland.
 Elevation / Depth of Seal: 9 ft
 Type of Seal: Bentonite.
 Elevation / Depth of Top of Filter Pack: 12 ft.
 Elevation / Depth of Top of Screen: 14.18 ft.
 Type of Screen: PVC
 Slot Size x Length: 19/20
 I.D. of Screen: 2"
 Type of Filter Pack: Pre Pack 20% Sand.
 Elevation / Depth of Bottom of Screen: 24.18 ft.
 Elevation / Depth of Bottom of Filter Pack: N/A
 Type of Backfill Below Well: None.
 Elevation / Total Depth of Borehole: 25 ft

Not to Scale



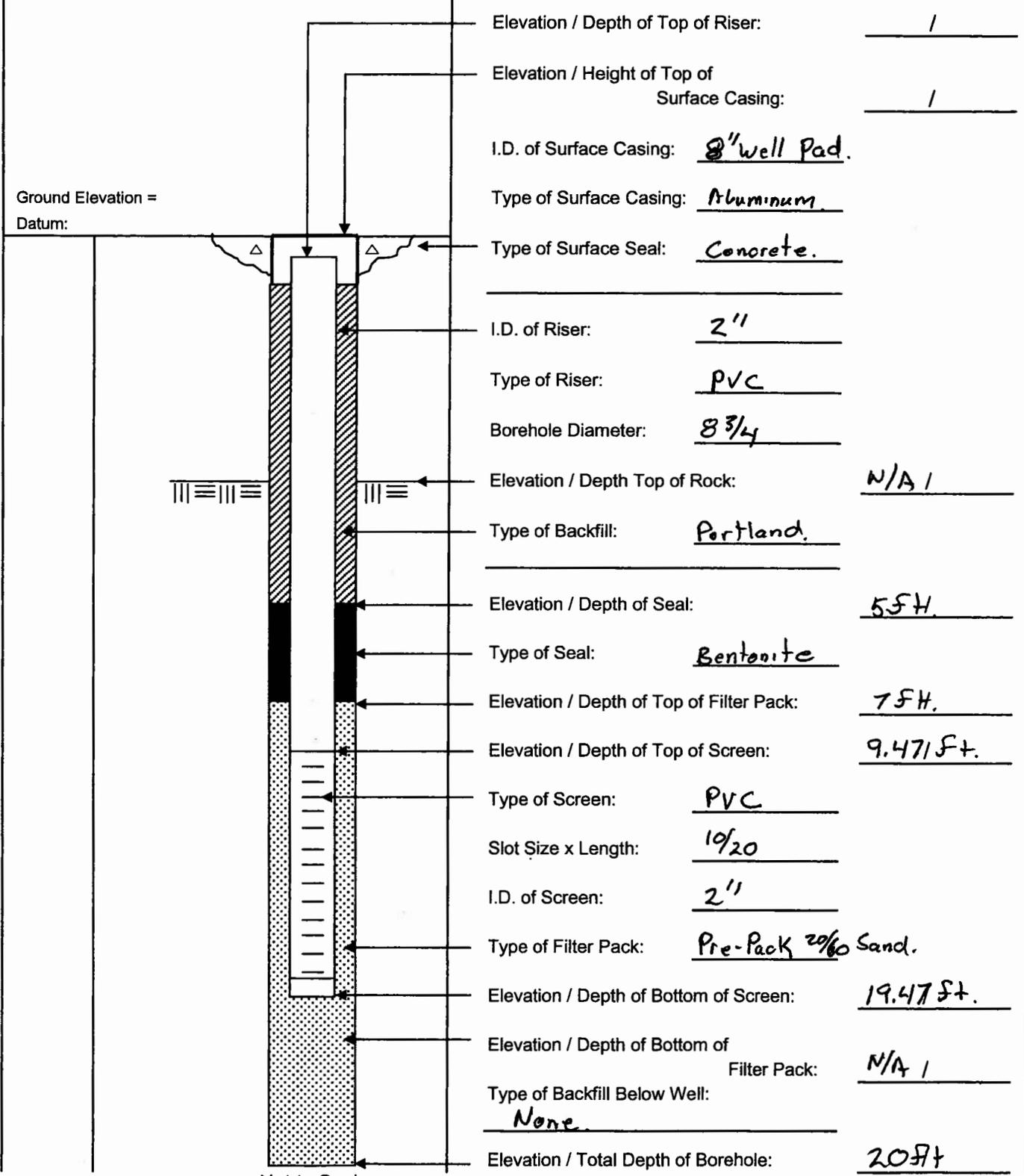
Tetra Tech NUS, Inc.

WELL No.:

GPT-03-15

MONITORING WELL SHEET

PROJECT: Site 3 RI DRILLING Co.: M3W BORING No.: GPT-03-15
 PROJECT No.: CTO-041 DRILLER: B. J. Oates DATE COMPLETED: 6-29-03
 SITE: 3 DRILLING METHOD: HSA NORTHING: _____
 GEOLOGIST: J. D. Spalding DEV. METHOD: Sub EASTING: _____



Ground Elevation =
Datum:

Elevation / Depth of Top of Riser: 1
 Elevation / Height of Top of Surface Casing: 1
 I.D. of Surface Casing: 8" well pad.
 Type of Surface Casing: Aluminum
 Type of Surface Seal: Concrete.
 I.D. of Riser: 2"
 Type of Riser: PVC
 Borehole Diameter: 8 3/4
 Elevation / Depth Top of Rock: N/A
 Type of Backfill: Portland.
 Elevation / Depth of Seal: 5.5 ft.
 Type of Seal: Bentonite
 Elevation / Depth of Top of Filter Pack: 7.5 ft.
 Elevation / Depth of Top of Screen: 9.47 ft.
 Type of Screen: PVC
 Slot Size x Length: 10/20
 I.D. of Screen: 2"
 Type of Filter Pack: Pre-Pack 20/60 Sand.
 Elevation / Depth of Bottom of Screen: 19.47 ft.
 Elevation / Depth of Bottom of Filter Pack: N/A
 Type of Backfill Below Well: None.
 Elevation / Total Depth of Borehole: 20.7 ft.

Not to Scale



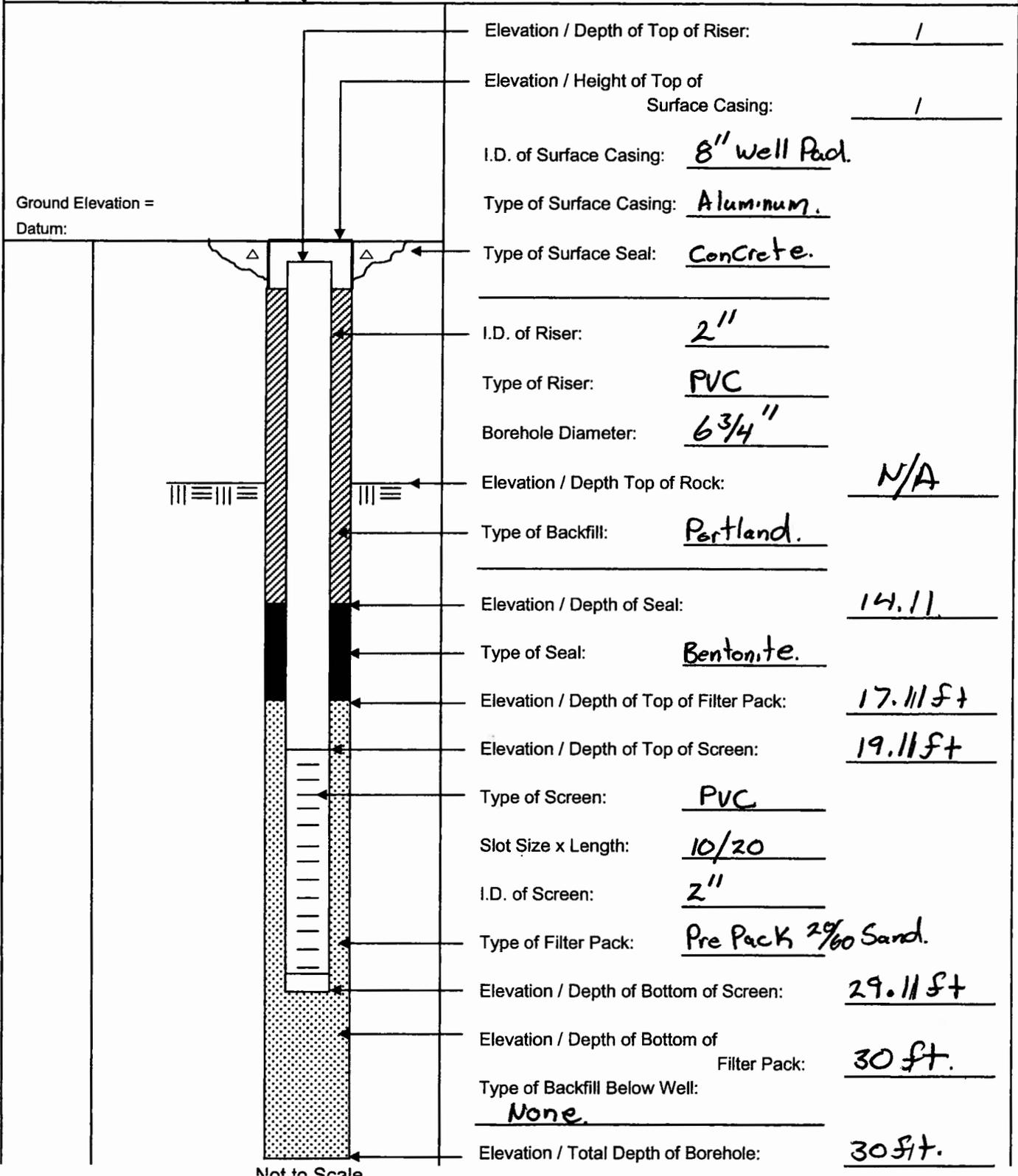
Tetra Tech NUS, Inc.

WELL No.:

GPT-03-16

MONITORING WELL SHEET

PROJECT: Site 3 RI DRILLING Co.: M&W BORING No.: GPT-03-16
 PROJECT No.: CTO-041 DRILLER: B. H. Oates DATE COMPLETED: 6-29-07
 SITE: 3 DRILLING METHOD: HSA NORTHING: _____
 GEOLOGIST: J. D. Spalding DEV. METHOD: Sub. EASTING: _____



Elevation / Depth of Top of Riser: 1

Elevation / Height of Top of Surface Casing: 1

I.D. of Surface Casing: 8" well Pack.

Type of Surface Casing: Aluminum.

Type of Surface Seal: Concrete.

I.D. of Riser: 2"

Type of Riser: PVC

Borehole Diameter: 6 3/4"

Elevation / Depth Top of Rock: N/A

Type of Backfill: Portland.

Elevation / Depth of Seal: 14.11

Type of Seal: Bentonite.

Elevation / Depth of Top of Filter Pack: 17.11 ft

Elevation / Depth of Top of Screen: 19.11 ft

Type of Screen: PVC

Slot Size x Length: 10/20

I.D. of Screen: 2"

Type of Filter Pack: Pre Pack 20/60 Sand.

Elevation / Depth of Bottom of Screen: 29.11 ft

Elevation / Depth of Bottom of Filter Pack: 30 ft.

Type of Backfill Below Well: None.

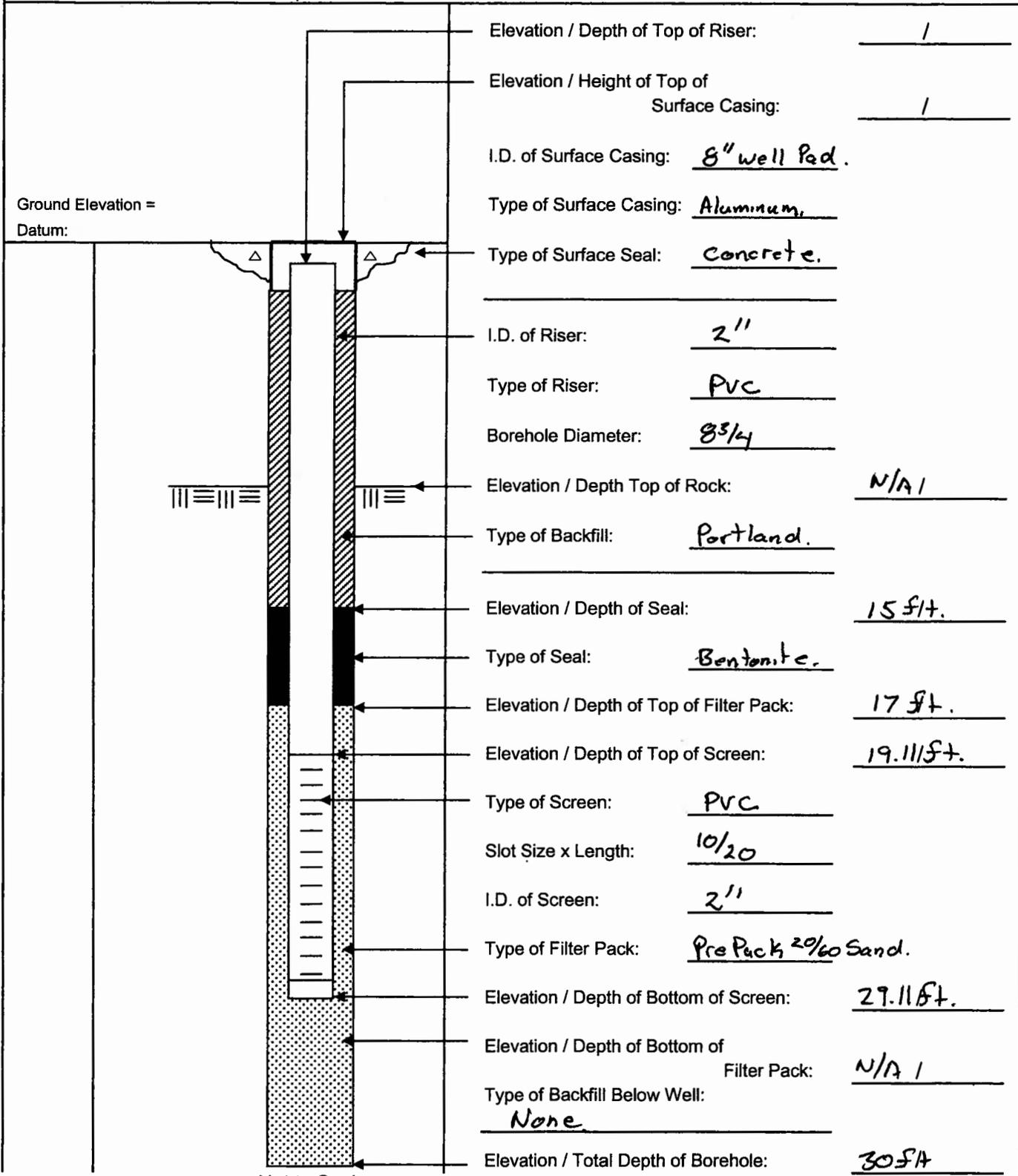
Elevation / Total Depth of Borehole: 30 ft.

Not to Scale



MONITORING WELL SHEET

PROJECT: Site 3 RI DRILLING Co.: M&W BORING No.: GPT-03-17
 PROJECT No.: CTO-041 DRILLER: Bill Oates DATE COMPLETED: 6-29-07
 SITE: 3 DRILLING METHOD: HSA NORTHING: _____
 GEOLOGIST: J.D. Spalding DEV. METHOD: Sub. EASTING: _____



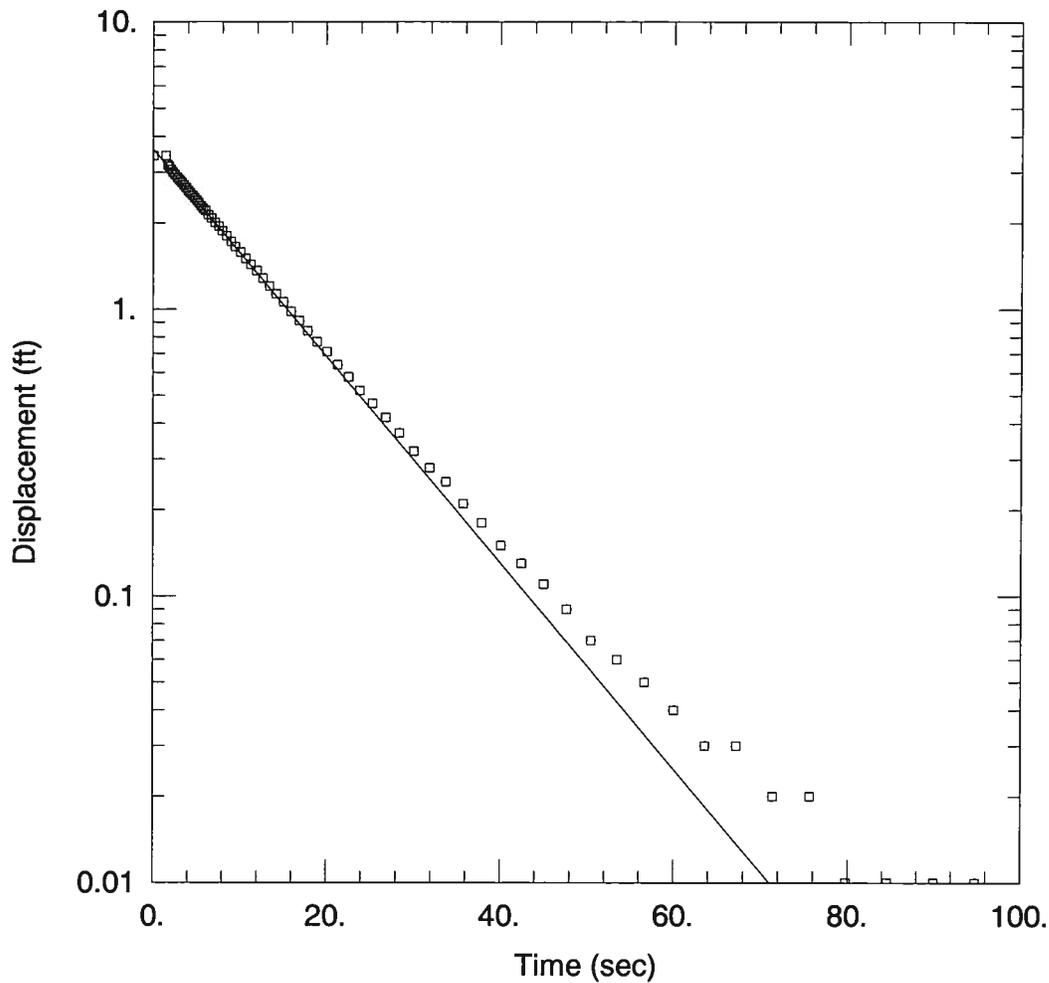
Site Information	
Site Name	GPT
Project	Site 3 R1
Project Number	1126
Date	10-29-07
Personnel	WBO

Well Information	
Name	2132 GPT-03-06
Inside Diameter	2"
Borehole Diameter	8"
Total Depth	26.59
Depth to Water	2.94
Water Column	23.65
Screen length	
TOC Elevation	

Data Logger	
Model	level+well 700
Serial Number	114493
Test Rate	LOS
Mode (TOC/SUR)	For SUR
Level/Func.	level

XD	
Model	level+well 700
Serial Number	114493
Scale	-
Offset	-
Linearity	-
PSI	5

Test Data			
Test Number	2132a	2132b	2132c
Well ID	2132	2132	2132
Slug In/Out	out	out	out
XD depth	10.00	10.00	10.00
XD install time	13:36	13:36	13:36
XD reading	4.24 PSI / 2.94'	2.95	2.95
slug depth	8.9	8.9	8.9
slug install time	13:40	13:58	14:13
slug length	6'	6'	6'
slug diameter	1 3/4"	1 3/4"	1 3/4"
slug volume	-	-	-
slug displacement	-	-	-
reference setting	2.94'	2.93'	2.97 4.25 PSI
reference reading	4.26 PSI	4.26 PSI	4.25
start time	13:48	14:02	14:21
initial displacement	3.23	4.09	3.88
end time	13:53	14:07	14:25
final XD reading	2.938'	4.25 PSI	4.24



WELL TEST ANALYSIS

Data Set: Y:\NAVY\MISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2132A.AQT

Date: 11/08/07

Time: 14:37:09

PROJECT INFORMATION

Company: Tetra Tech

Client: NAVFAC SE

Project: 112G00464

Test Location: NCBC Gulfport Site 3

Test Well: GPT-03-06

Test Date: 10-29/2007

AQUIFER DATA

Saturated Thickness: 50. ft

Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 3.43 ft

Water Column Height: 24. ft

Casing Radius: 0.0833 ft

Wellbore Radius: 0.25 ft

Screen Length: 10. ft

Gravel Pack Porosity: 0.3

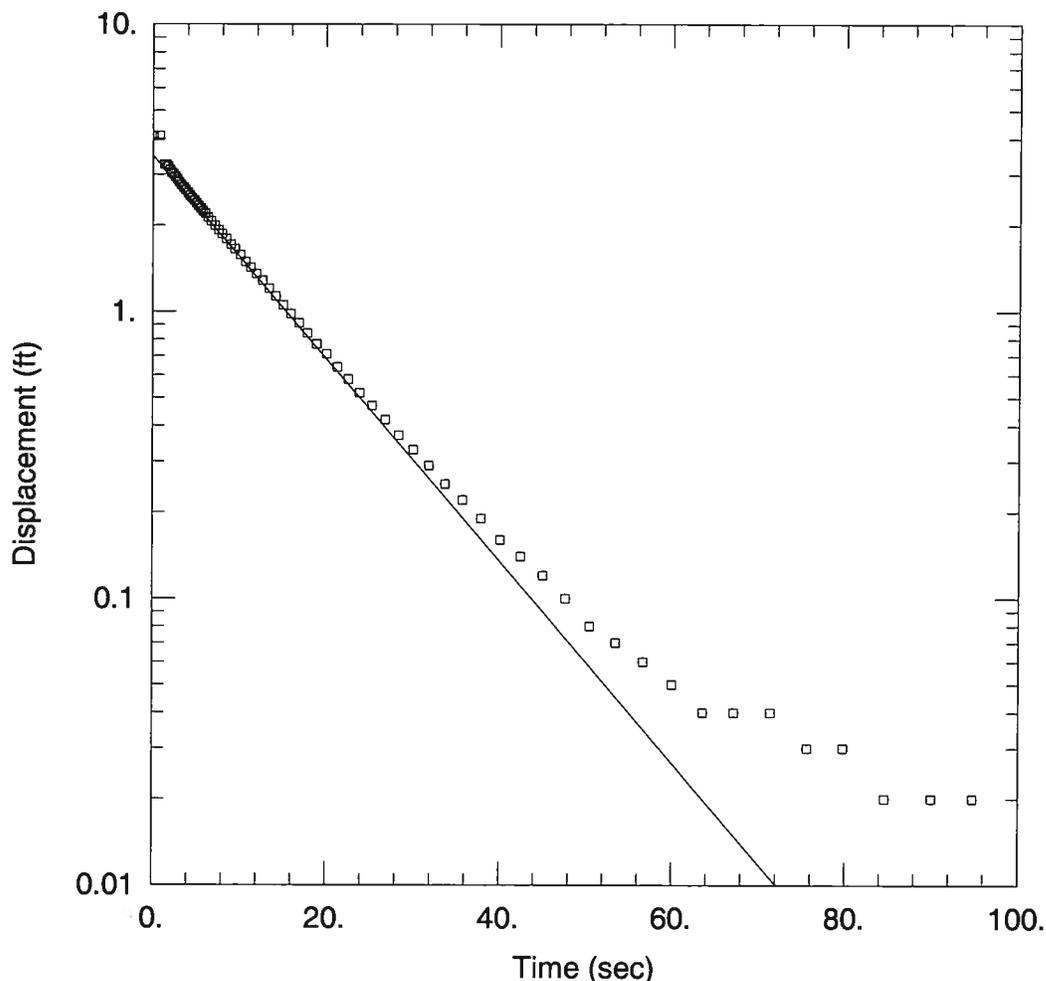
SOLUTION

Aquifer Model: Unconfined

K = 31.3 ft/day

Solution Method: Bouwer-Rice

y0 = 3.602 ft



WELL TEST ANALYSIS

Data Set: Y:\NAVY\MISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2132B.AQT
 Date: 11/09/07 Time: 10:11:00

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-06
 Test Date: 10-29/2007

AQUIFER DATA

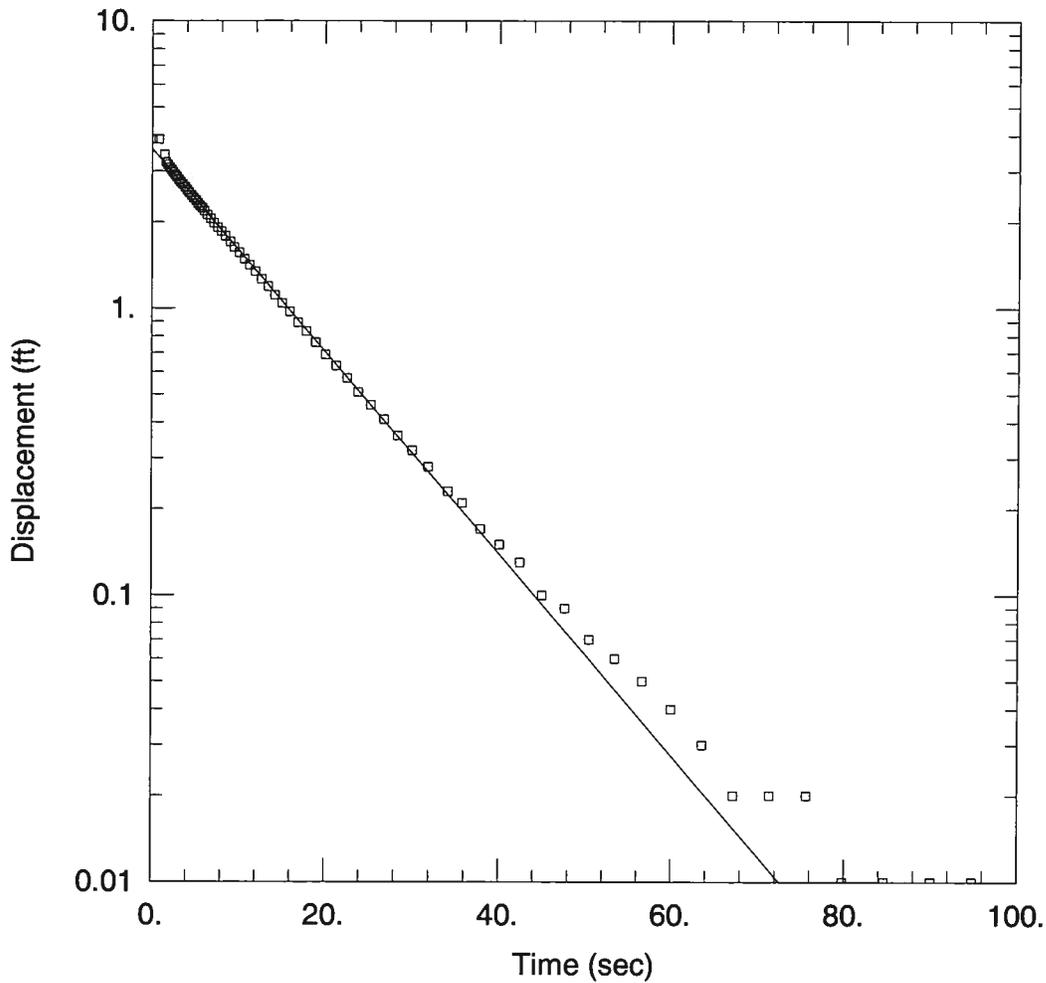
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 4.09 ft Water Column Height: 23.65 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.333 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 46.27 ft/day
 Solution Method: Bouwer-Rice y0 = 3.48 ft



WELL TEST ANALYSIS

Data Set: Y:\NAVYMISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2132C.AQT
 Date: 11/09/07 Time: 10:19:47

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-06
 Test Date: 10-29/2007

AQUIFER DATA

Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 3.88 ft Water Column Height: 23.65 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.333 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 46.24 ft/day
 Solution Method: Bouwer-Rice y0 = 3.581 ft

Site Information	
Site Name	GPT
Project	Site 3 RI
Project Number	
Date	10-31-09
Personnel	W.A.-OLSON

Well Information	
Name	2160 GPT-03-09
Inside Diameter	2"
Borehole Diameter	8"
Total Depth	25.39
Depth to Water	2.61
Water Column	22.78
Screen length	10'
TOC Elevation	

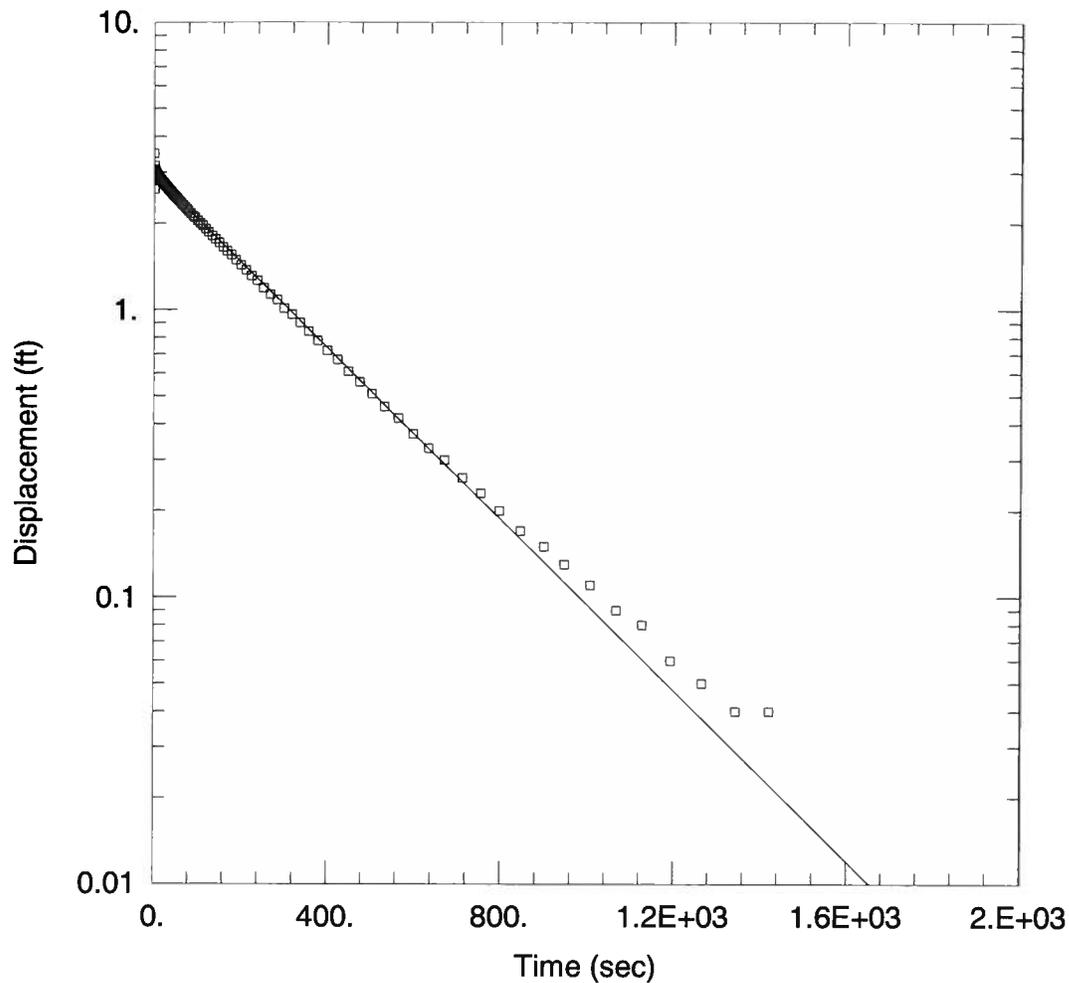
$$\begin{array}{r} 28.39 \\ - 2.61 \\ \hline 22.78 \end{array}$$

Data Logger	
Model	Level Troll 700
Serial Number	114493
Test Rate	LOG
Mode (TOC/SUR)	SUR TOC
Level/Func.	LEVEL

XD	
Model	Level Troll 700
Serial Number	114493
Scale	-
Offset	-
Linearity	-
PSI	5

Test Data			
Test Number	2160A	2160B	2160C
Well ID	2160	2160	2160
Slug In/Out	OUT	OUT	OUT
XD depth	10.5	10.5	10.5
XD install time	1612	1612	
XD reading	4.33 PSI	4.36	
slug depth	8.5	8.5	8.5
slug install time	1614	1652	
slug length	6'	6'	
slug diameter	1 3/4"	1 3/4"	
slug volume	-	-	
slug displacement	-	-	
reference setting	2.61'	2.61	
reference reading	4.33 PSI	4.43	
start time	1637	1720	
initial displacement	3.50	3.49	
end time	1650	1745	
final XD reading	4.36 PSI	4.42	

6' upred xd



WELL TEST ANALYSIS

Data Set: Y:\NAVY\MISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2160B.AQT
 Date: 11/09/07 Time: 09:55:45

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-09
 Test Date: 10-31/2007

AQUIFER DATA

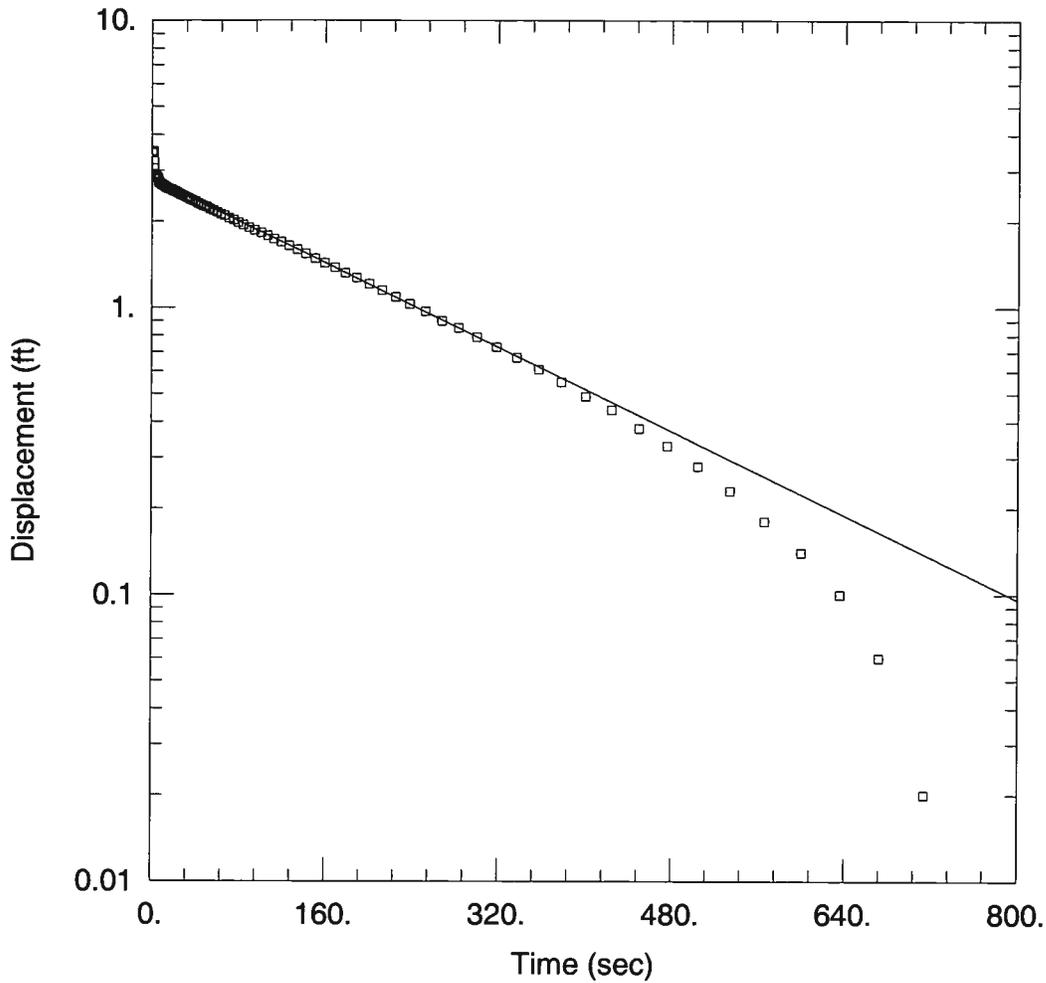
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 3.49 ft Water Column Height: 22.78 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.333 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 1.945 ft/day
 Solution Method: Bouwer-Rice y0 = 2.916 ft



WELL TEST ANALYSIS

Data Set: Y:\NAVYMISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2160A.AQT
 Date: 11/09/07 Time: 09:49:06

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-09
 Test Date: 10-31/2007

AQUIFER DATA

Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 3.5 ft Water Column Height: 22.78 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.333 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 2.39 ft/day
 Solution Method: Bouwer-Rice y0 = 2.81 ft

Site Information	
Site Name	GPT
Project	site 3 R1
Project Number	
Date	10-31-07
Personnel	WD OLSON

Well Information	
Name	2141 GPT-03-13
Inside Diameter	2"
Borehole Diameter	8"
Total Depth	29.60
Depth to Water	4.76
Water Column	24.84
Screen length	10'
TOC Elevation	

8'5"60
29.60
4.71
24.89

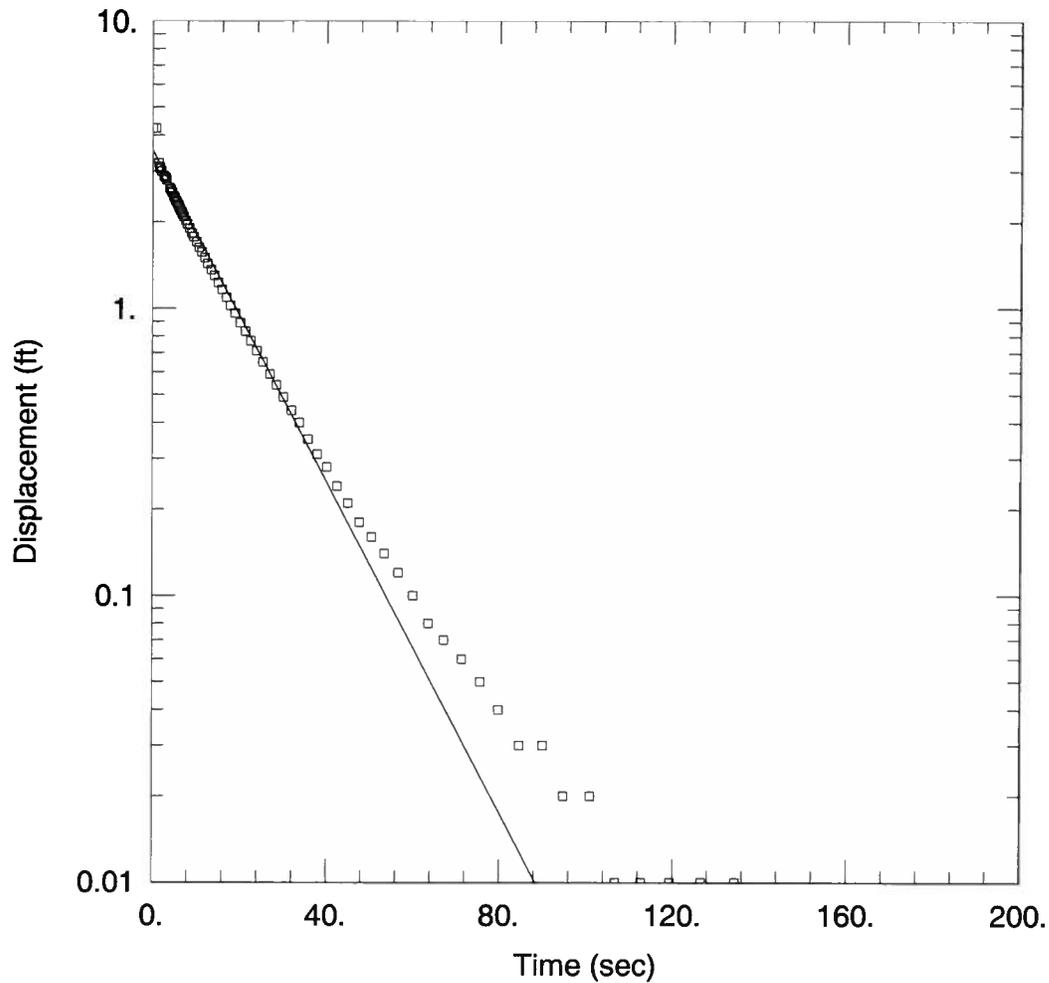
Data Logger	
Model	Level Trans 700
Serial Number	114493
Test Rate	
Mode (TOC/SUR)	
Level/Func.	

XD	
Model	
Serial Number	
Scale	
Offset	
Linearity	
PSI	5

Test Data			
Test Number	2141a	2141b	2141c
Well ID	2141	2141	2141
Slug In/Out	OUT	OUT	OUT
XD depth	12'	12'	12'
XD install time	14:55	14:55	14:55
XD reading	4.21 PSI	4.22	4.22 4.22
slug depth	10.5	10.5	10.5
slug install time	14:59	15:15	15:20
slug length	6'	6'	6'
slug diameter	1 3/4"	1 3/4"	1 3/4"
slug volume	~	~	~
slug displacement	~	~	~
reference setting	4.76'	4.76	4.76
reference reading	4.22 PSI	4.23 PSI	4.24 PSI 4.24 PSI
start time	15:07	15:23	15:37 15:46
initial displacement	3.45	4.23	3.57
end time	15:12	15:27	15:50
final XD reading	4.22 PSI	4.20	4.22

XD moved

XD Fall



WELL TEST ANALYSIS

Data Set: Y:\NAVY\MISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2141B.AQT
 Date: 11/08/07 Time: 16:04:29

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-13
 Test Date: 10-31/2007

AQUIFER DATA

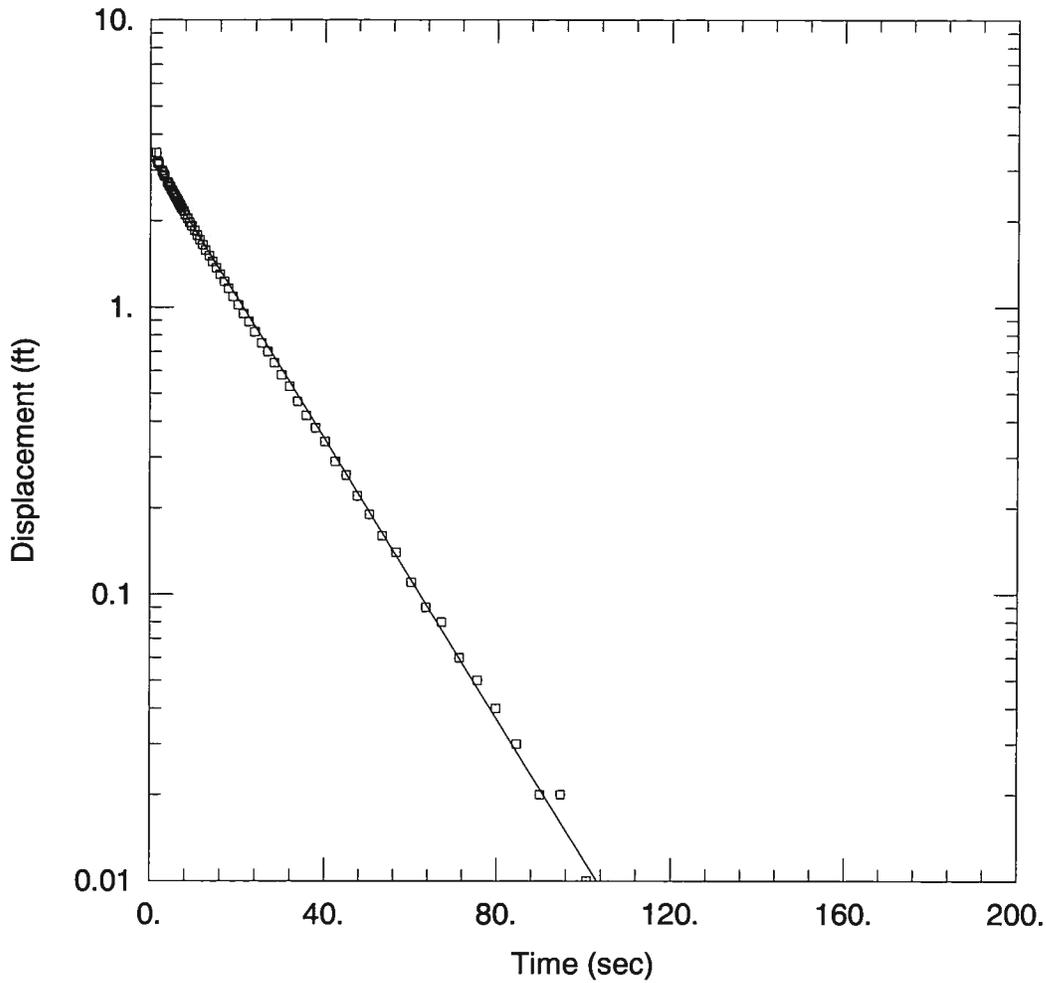
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 4.23 ft Water Column Height: 24.89 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.333 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 38.13 ft/day
 Solution Method: Bouwer-Rice y0 = 3.543 ft



WELL TEST ANALYSIS

Data Set: Y:\NAVYMISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2141A.AQT
 Date: 11/08/07 Time: 16:00:54

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-13
 Test Date: 10-31/2007

AQUIFER DATA

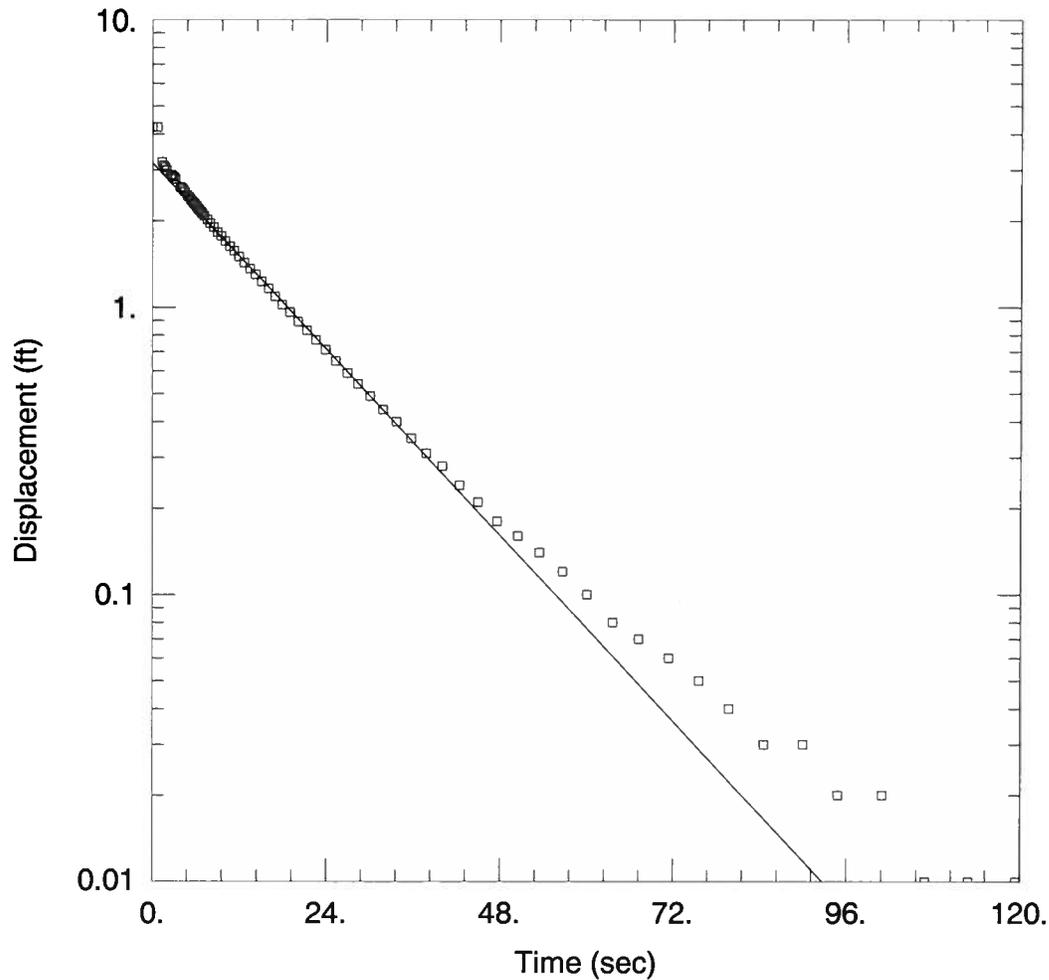
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 3.45 ft Water Column Height: 24.89 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.333 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 32.31 ft/day
 Solution Method: Bouwer-Rice y0 = 3.301 ft



WELL TEST ANALYSIS

Data Set: Y:\NAVY\MISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2141B.AQT
 Date: 11/08/07 Time: 16:05:22

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-13
 Test Date: 10-31/2007

AQUIFER DATA

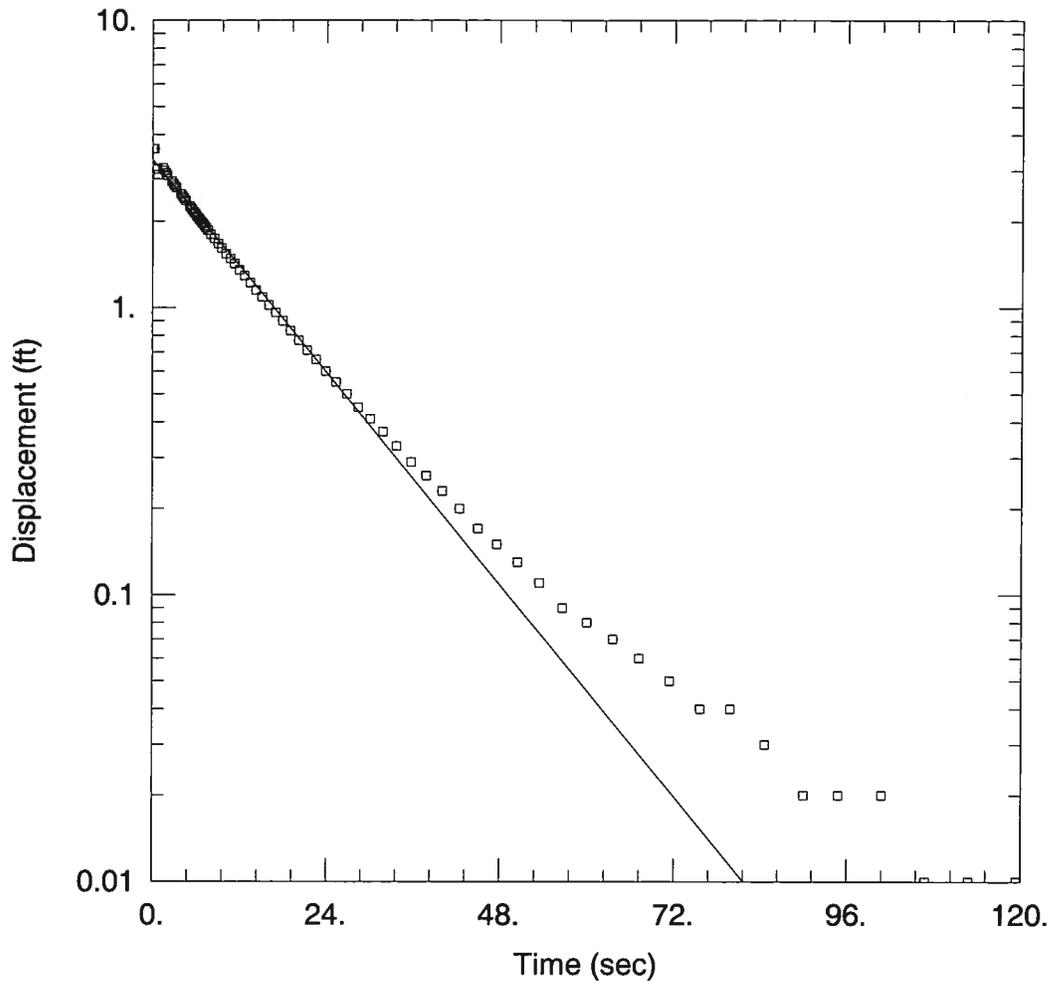
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 4.23 ft Water Column Height: 24.89 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.333 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 35.7 ft/day
 Solution Method: Bouwer-Rice y0 = 3.177 ft



WELL TEST ANALYSIS

Data Set: Y:\NAVY\MISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2141C.AQT
 Date: 11/08/07 Time: 16:09:48

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-13
 Test Date: 10-31/2007

AQUIFER DATA

Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 3.57 ft Water Column Height: 24.89 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.333 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 40.73 ft/day
 Solution Method: Bouwer-Rice y0 = 3.261 ft

<u>Site Information</u>	
Site Name	G-PT
Project	G-PT
Project Number	Site 3R1
Date	1126-
Personnel	10-31-07
	W.D. Olson

<u>Well Information</u>	
Name	2162 GAT-03-16
Inside Diameter	2"
Borehole Diameter	8"
Total Depth	19.55
Depth to Water	1.13
Water Column	18.42
Screen length	10'
TOC Elevation	

<u>Data Logger</u>	
Model	Level troll 700
Serial Number	114493
Test Rate	LOS
Mode (TOC/SUR)	TOC
Level/Func.	Level

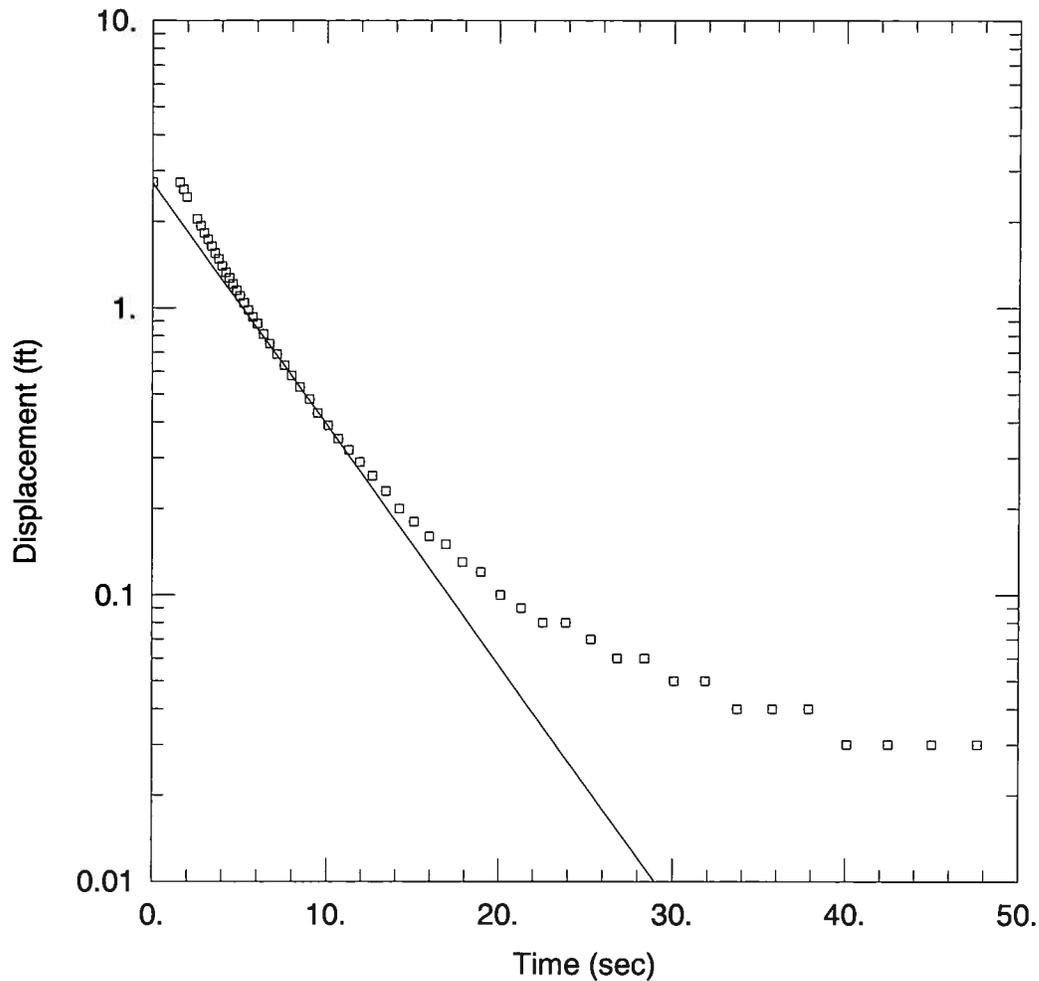
<u>XD</u>	
Model	Level troll 700
Serial Number	114493
Scale	-
Offset	-
Linearity	-
PSI	S

<u>Test Data</u>			
Test Number	2162a	2162b	2162c
Well ID	2162	2162	2162
Slug In/Out	OUT	OUT	OUT
XD depth	8'4"	8'4"	8'4"
XD install time	1500	1500	
XD reading	3.64 PSI	3.64 PSI	3.73
slug depth	7'	7'	7'
slug install time	1510	1520	1530
slug length	6'	6'	6'
slug diameter	1 3/4	1 3/4	1 3/4
slug volume	-	-	
slug displacement	-	-	
reference setting	1.13'	1.13'	1.13'
reference reading	3.64 PSI	3.64 PSI	3.73
start time	1515	1525	1536
initial displacement	2.74	3.30	2.70
end time	1518	1528	1540
final XD reading	3.61 PSI	3.58 PSI	3.73 PSI

XD moved
UP
on slug
removed

19.55
1.13

18.42



WELL TEST ANALYSIS

Data Set: Y:\NAVY\MISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2162A.AQT
 Date: 11/08/07 Time: 14:48:16

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-16
 Test Date: 10-30/2007

2.5
300'

AQUIFER DATA

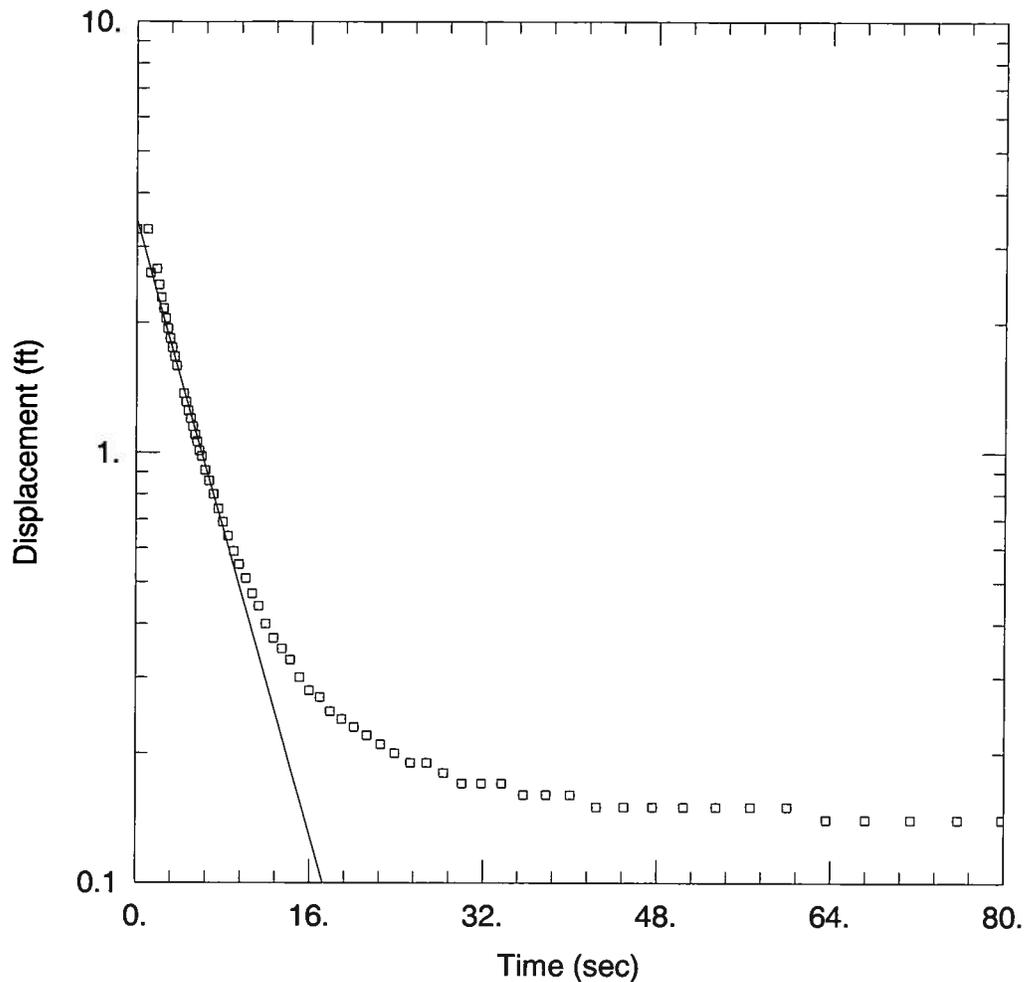
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 2.74 ft Water Column Height: 18.42 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.333 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 106.2 ft/day
 Solution Method: Bouwer-Rice y0 = 2.716 ft



WELL TEST ANALYSIS

Data Set: Y:\NAVYMISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2162B.AQT
 Date: 11/08/07 Time: 14:59:59

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-16
 Test Date: 10-30/2007

AQUIFER DATA

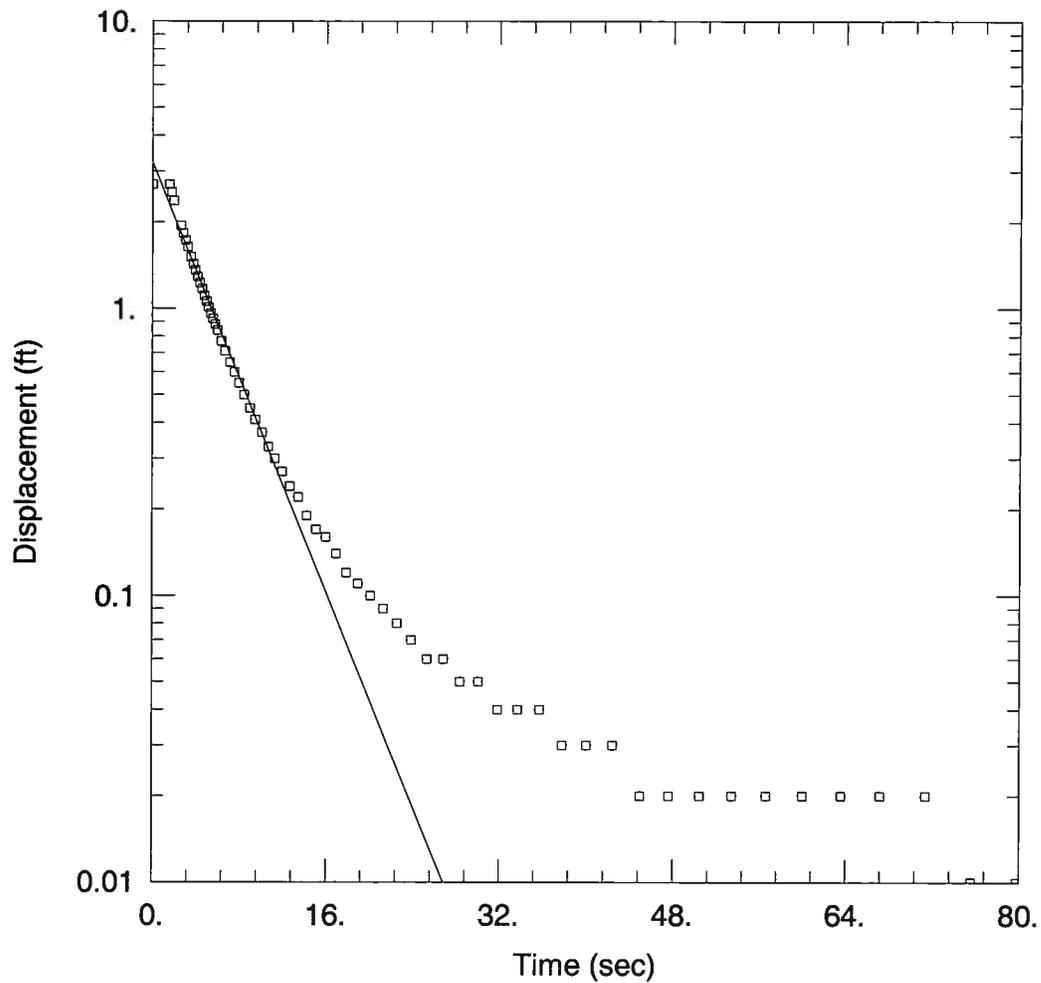
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 3.3 ft Water Column Height: 18.42 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.333 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 112.9 ft/day
 Solution Method: Bouwer-Rice y0 = 3.456 ft



WELL TEST ANALYSIS

Data Set: Y:\NAVY\MISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2162C.AQT
 Date: 12/06/07 Time: 15:26:07

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-16
 Test Date: 10-30/2007

AQUIFER DATA

Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 2.7 ft Water Column Height: 18.42 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.333 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 118.1 ft/day
 Solution Method: Bouwer-Rice y0 = 3.212 ft

Site Information	
Site Name	GPT
Project	Site 3 R1
Project Number	1126
Date	10.29.07
Personnel	WDD

Well Information	
Name	2134 GPT-03-07
Inside Diameter	2"
Borehole Diameter	8"
Total Depth	14.40
Depth to Water	2.60
Water Column	11.80
Screen length	10'
TOC Elevation	

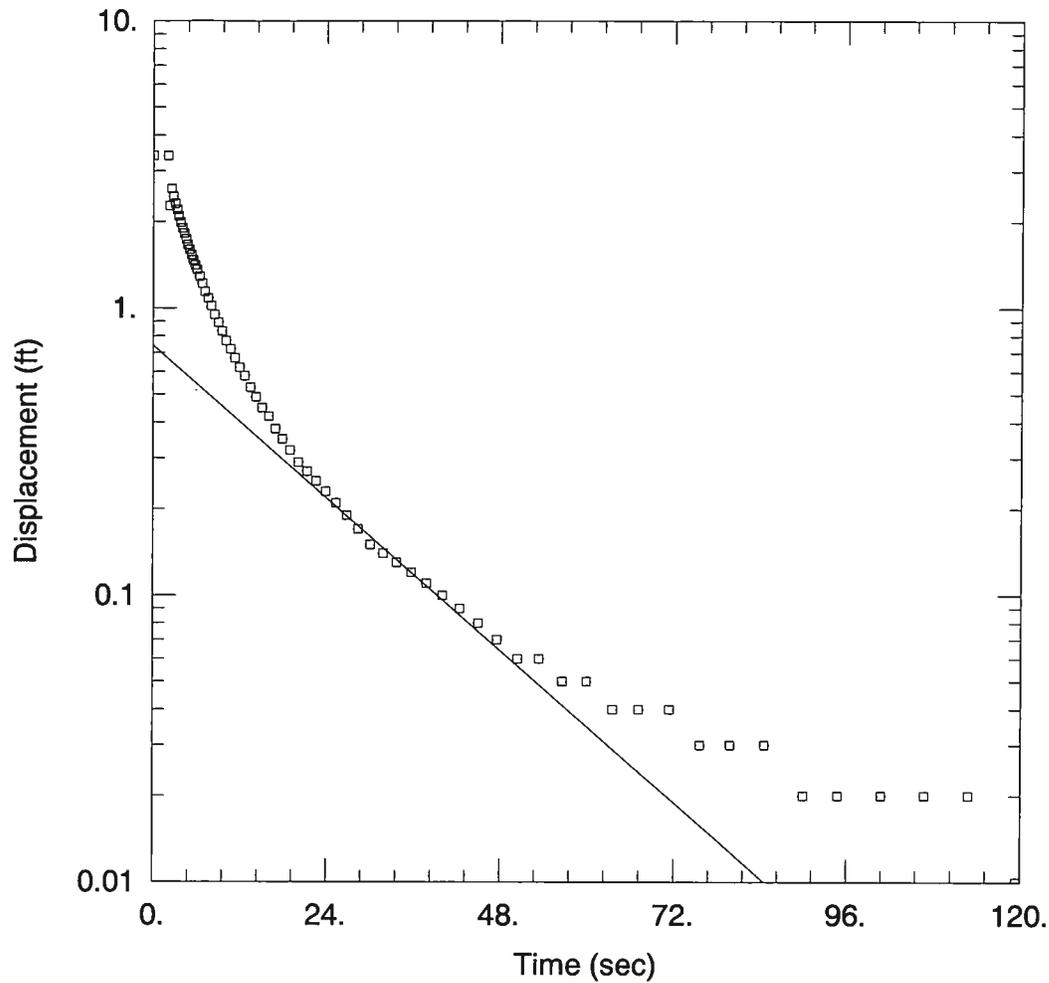
Data Logger	
Model	Level troll 700
Serial Number	114493
Test Rate	LOG
Mode (TOC/SUR)	sur
Level/Func.	Level

XD	
Model	Level troll 700
Serial Number	114493
Scale	—
Offset	—
Linearity	—
PSI	5

Test Data			
Test Number	2134a	2134B	2134c
Well ID	2134	2134	2134
Slug In/Out	out	out	out
XD depth	10'	10'	10'
XD install time	12:11 11:40	11:10	11:40
XD reading	10.03'	10.03	10.03
slug depth	8.5	8.5	8.5
slug install time	12:11	12:35	12:50
slug length	6'	6'	6'
slug diameter	1 3/4"	1 3/4"	1 3/4"
slug volume	—	—	—
slug displacement	—	—	—
reference setting	2.55'	2.55	2.55
reference reading	10.06'	10.02 / 4.36 PSI	10.07 4.37 PSI
start time	12:21	12:41	12:55
initial displacement	3.39	2.91	3.27
end time	12:31	12:47	1:00
final XD reading	2.55	2.55	2.55 4.36 PSI

8.5

10'



WELL TEST ANALYSIS

Data Set: Y:\NAVY\MISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2134A.AQT
 Date: 11/09/07 Time: 10:26:00

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-07
 Test Date: 10-29/2007

AQUIFER DATA

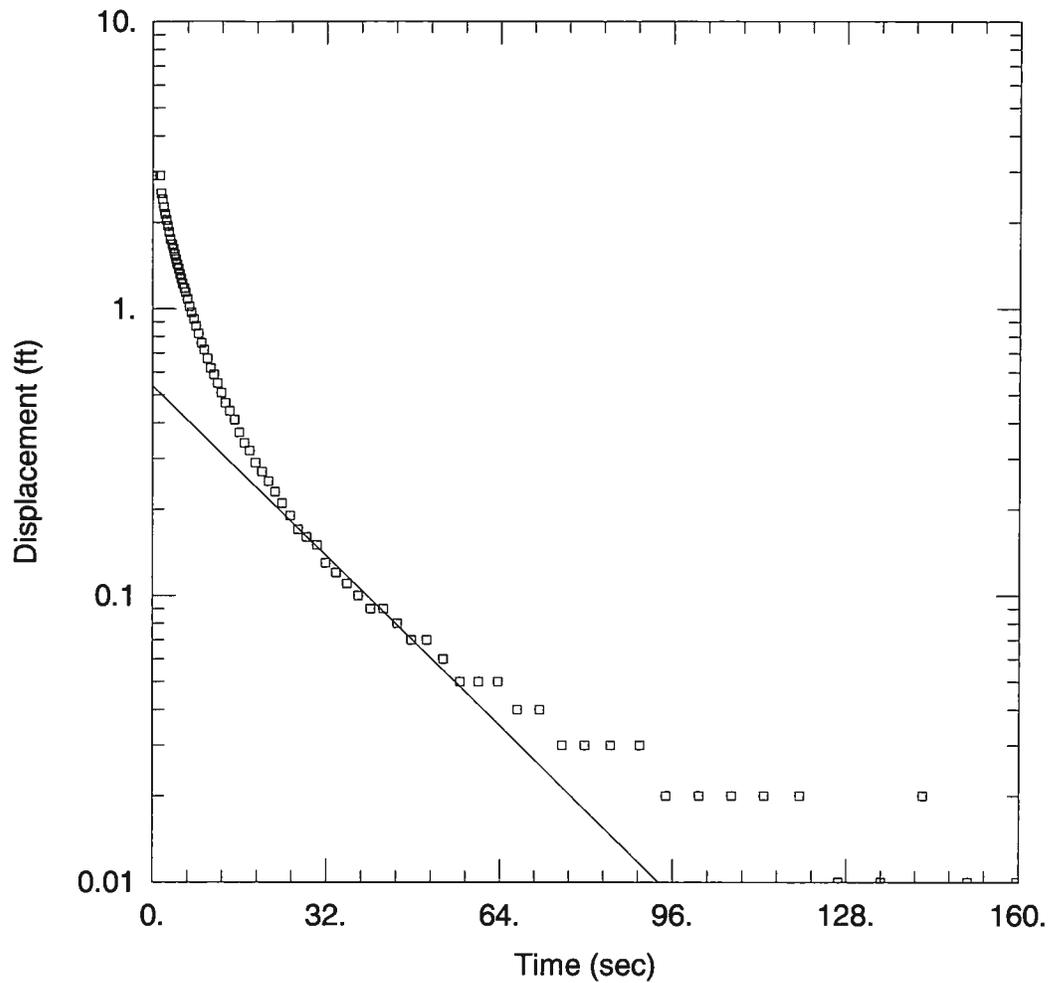
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 3.39 ft Water Column Height: 12. ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.25 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 17.42 ft/day
 Solution Method: Bouwer-Rice y0 = 0.7396 ft



WELL TEST ANALYSIS

Data Set: Y:\NAVY\MISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2134B.AQT
 Date: 12/06/07 Time: 15:23:53

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NBCB Gulfport Site 3
 Test Well: GPT-03-07
 Test Date: 10-29/2007

AQUIFER DATA

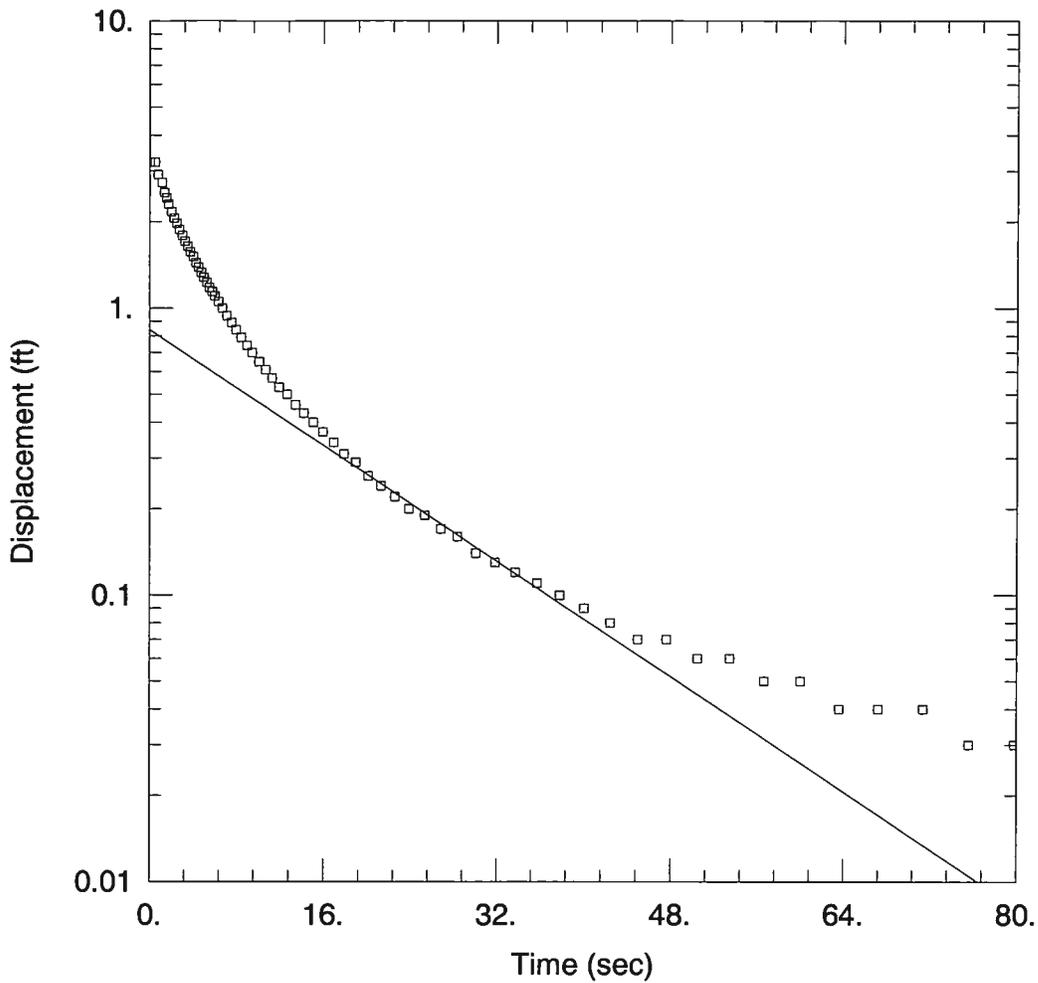
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 2.91 ft Water Column Height: 12. ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.25 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 14.59 ft/day
 Solution Method: Bouwer-Rice y0 = 0.538 ft



WELL TEST ANALYSIS

Data Set: Y:\NAVYMISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2134C.AQT
 Date: 12/06/07 Time: 15:21:19

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-07
 Test Date: 10-29/2007

AQUIFER DATA

Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 3.22 ft Water Column Height: 11.8 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.25 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 19.78 ft/day
 Solution Method: Bouwer-Rice y0 = 0.8393 ft

Site Information	
Site Name	GPT
Project	S.4.3 RI
Project Number	1126
Date	10-30-07
Personnel	W.D. OLSON

Well Information	
Name	2146 GPT-03-1817
Inside Diameter	2"
Borehole Diameter	8"
Total Depth	29.23
Depth to Water	3.71
Water Column	25.52
Screen length	10'
TOC Elevation	

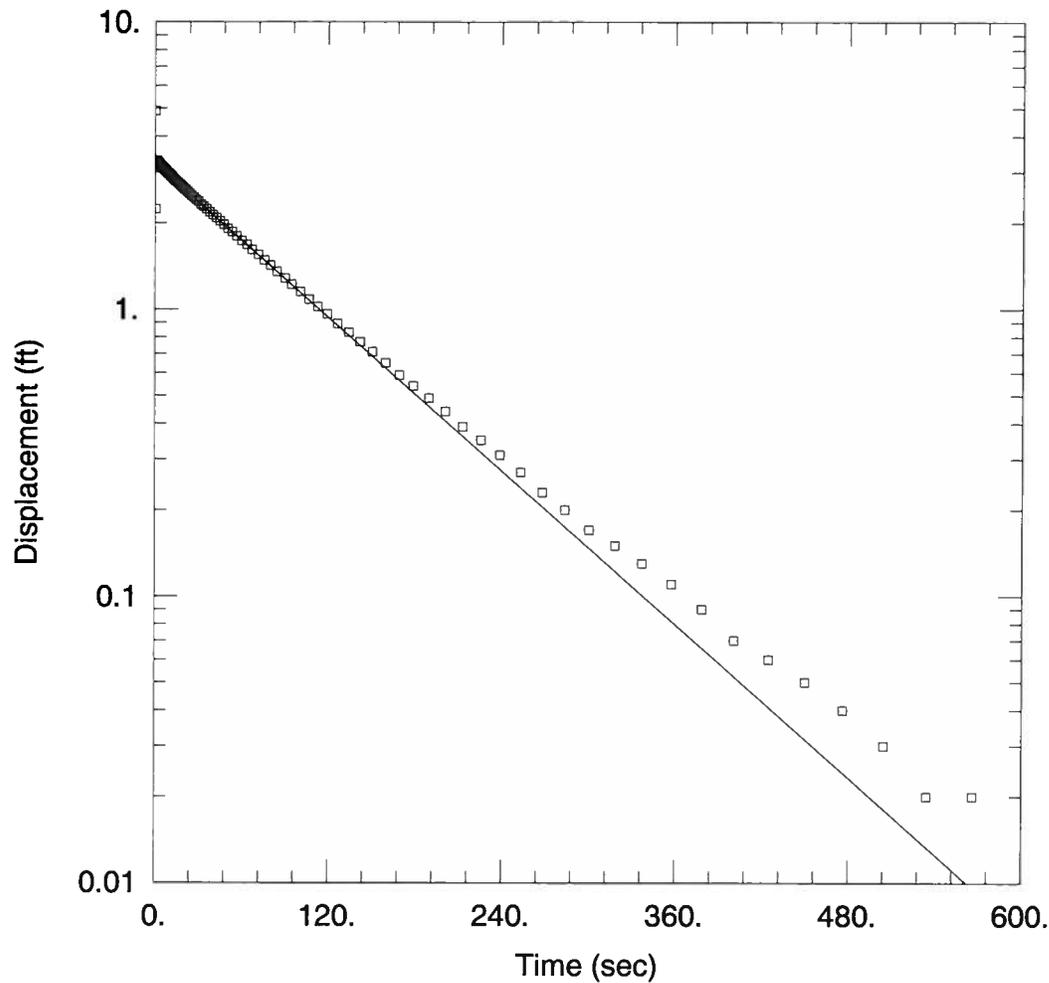
29.23
 3.71

 25.52

Data Logger	
Model	Level Trans 200
Serial Number	114493
Test Rate	LOG
Mode (TOC/SUR)	SUR
Level/Func.	Level

XD	
Model	Level Trans 200
Serial Number	114493
Scale	-
Offset	-
Linearity	-
PSI	5

Test Data			
Test Number	2146 A	2146 B	2146 C
Well ID	2146	2146	2146
Slug In/Out	OUT	OUT	OUT
XD depth	12'	12'	12'
XD install time	1610	1610	1610
XD reading	3.75 PSI	3.81 PSI	3.81 PSI
slug depth	9.5	9.5	9.5
slug install time	1620	1656	1517
slug length	6'	6'	6'
slug diameter	1 3/4"	1 3/4"	1 3/4"
slug volume	-	-	-
slug displacement	-	-	-
reference setting	3.71	3.71'	3.71'
reference reading	3.82 PSI	3.82 PSI	3.81 PSI
start time	1440	1704	1727
initial displacement	4.63	3.79	4.89
end time	1652	1715	1739
final XD reading	3.81	3.81	1739 3.80



WELL TEST ANALYSIS

Data Set: Y:\NAVY\MISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2146C.AQT
 Date: 11/08/07 Time: 15:55:45

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-17
 Test Date: 10-30/2007

AQUIFER DATA

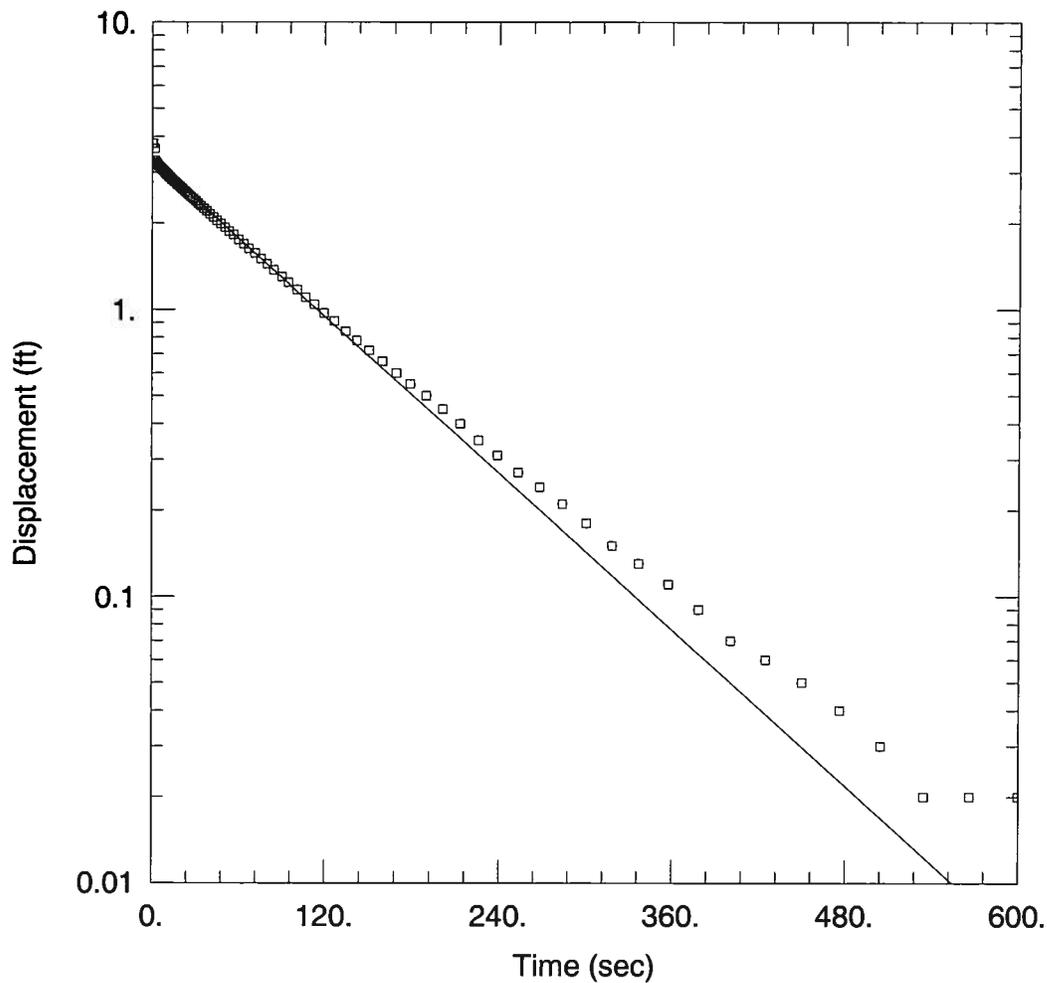
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 4.89 ft Water Column Height: 25.52 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.333 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 5.919 ft/day
 Solution Method: Bouwer-Rice y0 = 3.211 ft



WELL TEST ANALYSIS

Data Set: Y:\NAVY\MISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2146B.AQT

Date: 11/08/07

Time: 15:52:04

PROJECT INFORMATION

Company: Tetra Tech

Client: NAVFAC SE

Project: 112G00464

Test Location: NCBC Gulfport Site 3

Test Well: GPT-03-17

Test Date: 10-30/2007

AQUIFER DATA

Saturated Thickness: 50. ft

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA

Initial Displacement: 3.79 ft

Water Column Height: 25.52 ft

Casing Radius: 0.0833 ft

Wellbore Radius: 0.333 ft

Screen Length: 10. ft

Gravel Pack Porosity: 0.3

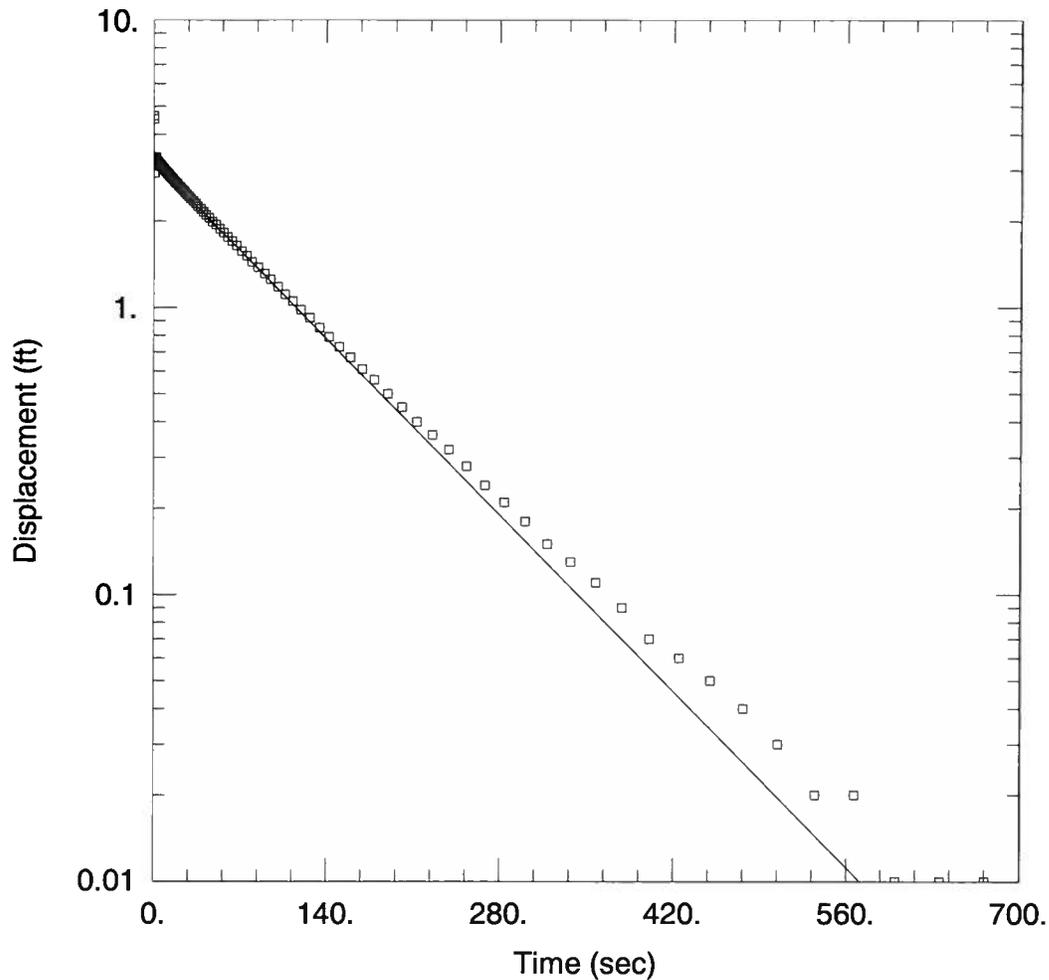
SOLUTION

Aquifer Model: Unconfined

$K = 6.036$ ft/day

Solution Method: Bouwer-Rice

$y_0 = 3.314$ ft



WELL TEST ANALYSIS

Data Set: Y:\NAVY\MISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2146.AQT
 Date: 11/08/07 Time: 15:38:27

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-17
 Test Date: 10-30/2007

AQUIFER DATA

Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 4.63 ft Water Column Height: 25.52 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.333 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 5.825 ft/day
 Solution Method: Bouwer-Rice y0 = 3.201 ft

Site Information	
Site Name	GPT
Project	Site 3 R1
Project Number	1126
Date	10.29.07
Personnel	W.D. OLSON

Well Information	
Name	2133 GPT-03-04 (R)
Inside Diameter	2"
Borehole Diameter	Ø"
Total Depth	23.37
Depth to Water	1.66
Water Column	21.71
Screen length	
TOC Elevation	

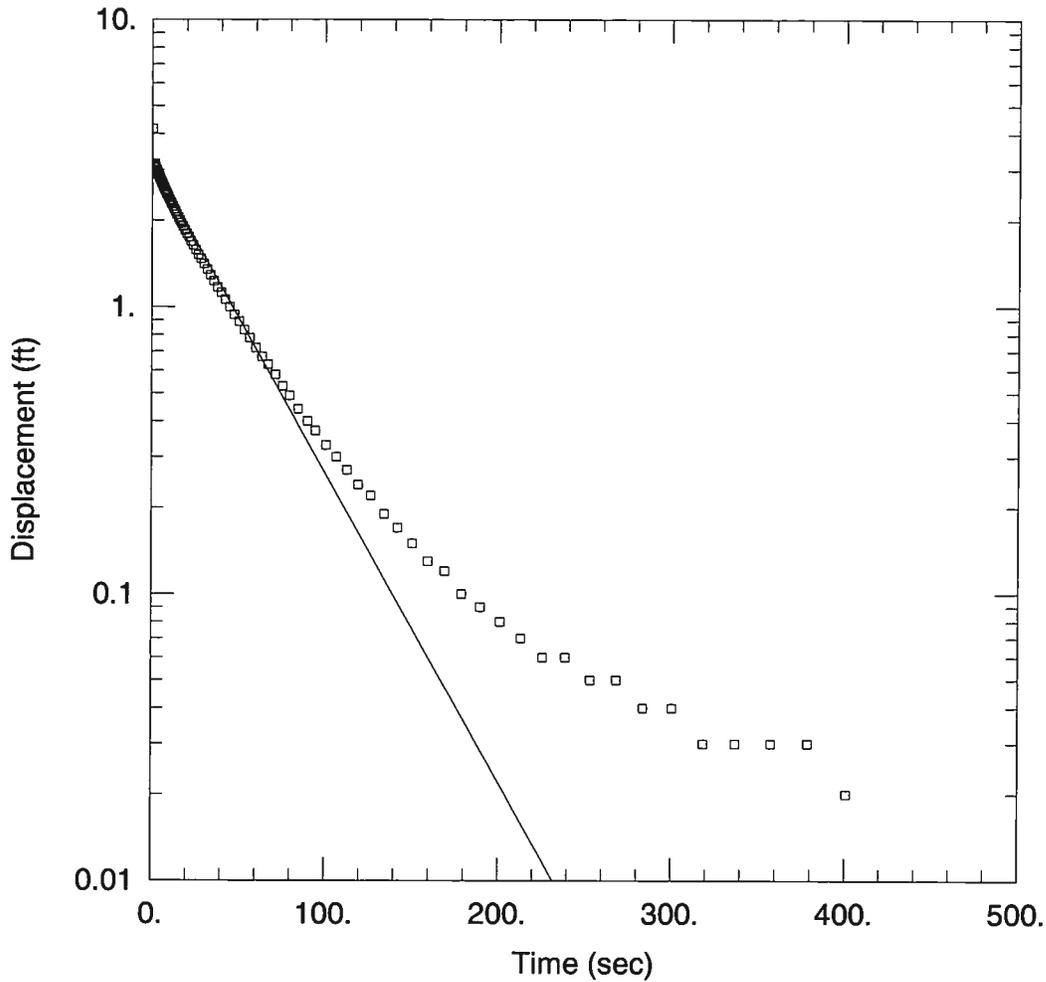
28.37
 1.66

 21.71

Data Logger	
Model	Level Logger 700
Serial Number	114493
Test Rate	LOS
Mode (TOC/SUR)	TOC
Level/Func.	Level

XD	
Model	Level Logger 700
Serial Number	114493
Scale	-
Offset	-
Linearity	-
PSI	.5

Test Data			
Test Number	2133A	2133B	2133C
Well ID	2133	2133	2133
Slug In/Out	OUT	OUT	OUT
XD depth	10.00	10.00	10.00
XD install time	1507	1534	1534
XD reading	4.79 PSI	4.32 PSI	4.32
slug depth	7.5	7.5	7.5
slug install time	1518	1535	1555
slug length	6'	6'	6'
slug diameter	1 3/4"	1 3/4"	1 3/4"
slug volume	-	-	-
slug displacement	-	-	-
reference setting	1.65'	1.65	1.65
reference reading	4.81 PSI	4.34 PSI	4.34 PSI
start time	1525	1544	1600
initial displacement	3.64	4.11	4.16
end time	1532	1600/530	1607
final XD reading	1532 4.8 PSI	4.32 PSI	4.32



WELL TEST ANALYSIS

Data Set: Y:\NAVYMISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2133C.AQT
 Date: 11/09/07 Time: 09:26:21

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-04
 Test Date: 10-29/2007

AQUIFER DATA

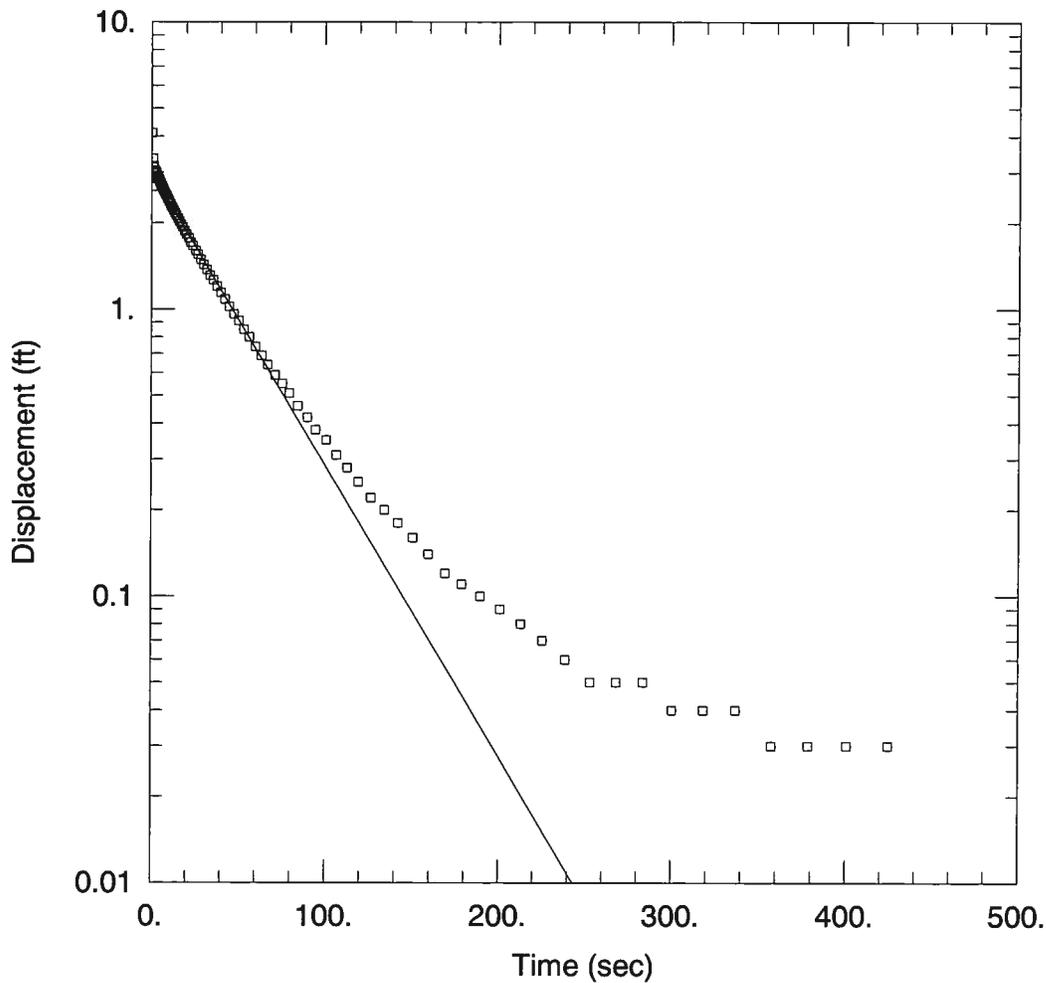
Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 4.16 ft Water Column Height: 21.71 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.25 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 9.252 ft/day
 Solution Method: Bouwer-Rice y0 = 3.185 ft



WELL TEST ANALYSIS

Data Set:

Date: 11/09/07

Time: 09:16:34

PROJECT INFORMATION

Company: Tetra Tech

Client: NAVFAC SE

Project: 112G00464

Test Location: NCBC Gulfport Site 3

Test Well: GPT-03-04

Test Date: 10-29/2007

AQUIFER DATA

Saturated Thickness: 50. ft

Anisotropy Ratio (K_z/K_r): 0.1

WELL DATA

Initial Displacement: 4.11 ft

Water Column Height: 21.71 ft

Casing Radius: 0.0833 ft

Wellbore Radius: 0.25 ft

Screen Length: 10. ft

Gravel Pack Porosity: 0.3

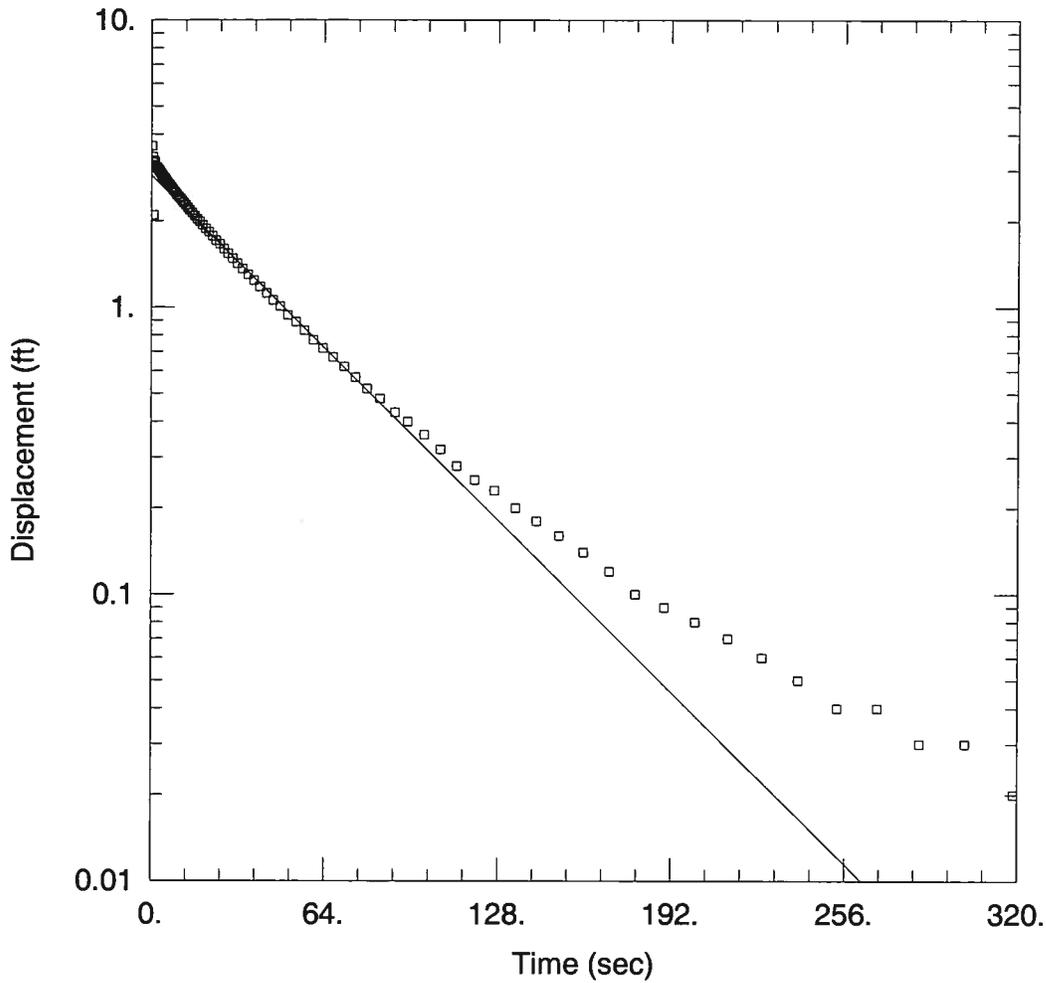
SOLUTION

Aquifer Model: Unconfined

$K = 8.713$ ft/day

Solution Method: Bouwer-Rice

$y_0 = 2.984$ ft



WELL TEST ANALYSIS

Data Set: Y:\NAVYMISSIS~1\CTO40A~1\SLUGTE~1\EXPORT~1\2133A.AQT
 Date: 11/09/07 Time: 09:11:26

PROJECT INFORMATION

Company: Tetra Tech
 Client: NAVFAC SE
 Project: 112G00464
 Test Location: NCBC Gulfport Site 3
 Test Well: GPT-03-04
 Test Date: 10-29/2007

AQUIFER DATA

Saturated Thickness: 50. ft Anisotropy Ratio (Kz/Kr): 0.1

WELL DATA

Initial Displacement: 3.64 ft Water Column Height: 21.71 ft
 Casing Radius: 0.0833 ft Wellbore Radius: 0.25 ft
 Screen Length: 10. ft Gravel Pack Porosity: 0.3

SOLUTION

Aquifer Model: Unconfined K = 8.031 ft/day
 Solution Method: Bouwer-Rice y0 = 2.875 ft



BORING LOG

PROJECT NAME: G-PT 3 R1 BORING NUMBER: 035B 11
 PROJECT NUMBER: 112 G 00464 DATE: 10-14-10
 DRILLING COMPANY: Mtw GEOLOGIST: W.A. OLSON
 DRILLING RIG: 12PT DRILLER: D. Duncan

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION		U S C S *	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color			Material Classification	Sample	Sampler BZ	Borehole**
								PID/APM				
						TAW FS no Hled		4.8				
						w/ brown						
						Brown silty sand		5.8				
						white FS		5.6				
						TAW FS w/ory no Hled		5.5				5-7
								3.7				
						orange FS						
						white FS		5.2				10-12
								4.0				
								4.1				
						orange + gray FS		7.2				035B 11 15-17 10/10
						gray sandy clay		8.8				
								5.5				
								5.5				
								5.7				
								4.7				

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #: _____



BORING LOG

PROJECT NAME: _____
 PROJECT NUMBER: _____
 DRILLING COMPANY: _____
 DRILLING RIG: _____

BORING NUMBER: 03SB11
 DATE: _____
 GEOLOGIST: _____
 DRILLER: _____

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
	25								PID/PPm				
	30												
	35												
	40												

026-1104
 38-40
 0955

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____
 Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____



BORING LOG

PROJECT NAME: _____
 PROJECT NUMBER: _____
 DRILLING COMPANY: _____
 DRILLING RIG: _____

BORING NUMBER: 03SB12
 DATE: _____
 GEOLOGIST: _____
 DRILLER: _____

Sample No. and Type or RQD	Depth (Ft) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)									
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**						
	2.5																		
							grey-Dk grey S&C1		4.5										
							-CISA		5.4										
									*										
									6.4										
									*										
	30						Same as above		4.7										
									*										
									6.3										
									↓										
	35						34'+ Med S&C Grey Sand		-734-35=6.6										34-36
							Push through												-ws
							To Bridge flowing												03GP1203
							Sand Layer												
							↓												
	40						Sand filled 2 nd Attempted												-39-41
							Pushed through -45ft												-ws
							↓												03GP1204
	45						green clay												
	50																		

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm):

Converted to Well: Yes No Well I.D. #: _____



BORING LOG

PROJECT NAME: _____ BORING NUMBER: 035B13
 PROJECT NUMBER: _____ DATE: 10-15-06
 DRILLING COMPANY: _____ GEOLOGIST: W.D. OLSON
 DRILLING RIG: _____ DRILLER: D. DUNCAN

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION		U S C S *	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color			Material Classification	Sample	Sampler BZ	Borehole**
						gray/black silty FS		2.7				
						Brown silty sand		5.1				
						gray FS		5.8				
						omnipresent clayey sand		6.3				
						gray clayey sand		6.1				
						w/ to 1 gray FS		6.2				
								5.1				
						gray sandy clay		4.9				
								11.0				
								5.1				
								9.7				
								10.0				
						1" sand lens		9.0				

8-10
 12-14
 036-P1302
 1145

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole... Increase reading frequency if elevated response read.
 Remarks: _____
 Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____



BORING LOG

PROJECT NAME: CPT 3R1 BORING NUMBER: 035B01
 PROJECT NUMBER: 1126-00464 DATE: 10-10-16
 DRILLING COMPANY: mtw GEOLOGIST: W.D. Olson
 DRILLING RIG: DPY DRILLER: D. Decker

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
									PID/APP				
							Brn silty sand				0.2		
							gray FS				1.2		
							w FS		wet @ 4'		0.9		
											1.0		
							w FS				0.3		
							orange mottles				1.1		
											1.6		
											1.1		
											0.9		
							w FS				2.4		
											3.0		
											3.5		
							gray sandy clay				2.6		

046P0101
1225
6-8

046P010
1246
12-16

046P063
20-24
1312

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.
 Remarks: _____
 Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____

4-9
12-16
19-23
4-23
19



BORING LOG

PROJECT NAME: GRT 3 RI
 PROJECT NUMBER: 112-G-00464
 DRILLING COMPANY: MPL
 DRILLING RIG: DPT

BORING NUMBER: 03SB02
 DATE: 10/10/06
 GEOLOGIST: W.D. Olson
 DRILLER: D. Dunlop

Sample No. and Type or RQD	Depth (Ft) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft) or Screened Interval	MATERIAL DESCRIPTION		USCS*	Remarks	PID/FID Reading (ppm)				
					Soil Density/Consistency or Rock Hardness	Color			Material Classification	Sample	Sampler BZ	Borehole**	Driller BZ**
						BRN silty clay		PI/FAH					
						black asphalt / ^{blue} plastic clay							
						wht FS							
						w/clay strings/glass							
						w FS		water @ 4'					
						trace silt							
						± TW FS							
						wht FS							
						TW FS, some clay strings							
						orange FS							
						gray clayey sand							
						gray clayey sand and clay							
						gray sandy clay							

03GP020
6-10

CO=50

CO=51
03GP020
CO=83
14-11
09/06
CO=22

5

10

15

20

25

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm): 0.0

Converted to Well: Yes _____ No _____ Well I.D. #: _____

42

38

6-8
10-12

14-18



BORING LOG

PROJECT NAME: _____
 PROJECT NUMBER: _____
 DRILLING COMPANY: _____
 DRILLING RIG: _____

BORING NUMBER: 03SR02
 DATE: _____
 GEOLOGIST: _____
 DRILLER: _____

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			USCS*	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
	25						Sand		PID/PPM	0.0			
										0.0			
							Sandier			0.0			
	30						gray sandy clay			0.0			
										0.0			
										0.0			
	35						gray med sand qtz, subrounded			0.0			
										0.0			
										0.0			
	40									0.0			
										0.0			
										0.0			
	45						green/gray plastic clay						
	50												

036-P0205
 38 0045
 42
 43

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #: _____



BORING LOG

PROJECT NAME: GAT 3 RI BORING NUMBER: 035B03
 PROJECT NUMBER: 112600464 DATE: 10/11/06
 DRILLING COMPANY: MPW GEOLOGIST: W.A. Olsen
 DRILLING RIG: DPT DRILLER: D. Dunen

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
	25								1.1				
									1.1				
									1.0				
	30								1.0				
									1.2				
									1.0				
	35								1.2				
									1.1				
	40												
	45												
	50												

035B03
40-42
1515

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.
 Remarks: _____ Drilling Area Background (ppm):

Converted to Well: Yes No Well I.D. #: _____



BORING LOG

PROJECT NAME: GAT 3 RI BORING NUMBER: 035R04
 PROJECT NUMBER: 112G-00464 DATE: 10-11-06
 DRILLING COMPANY: MPW GEOLOGIST: W.A. Olson
 DRILLING RIG: DPT DRILLER: D. Dunca

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION		U S C S *	Remarks	PID/FID Reading (ppm)								
					Soil Density/ Consistency or Rock Hardness	Color			Material Classification	Sample	Sampler BZ	Borehole**	Driller BZ**				
						BRN silty clay											
						blk silty FS w/ wood debris		0.9									
						white silty FS		5.9									
						BRN silty FS		5.7									
						white FS w/ clay		1.2									
								0.6									
						Lt gray FS		0.8									
								0.8									
								0.5									
						increased clay		1.0									
						gray clay		1.0									
						gray sandy clay		0.9									
								0.8									
								1.0									

5

10

15

20

04G-P0401
9-11
NO SAND

03G-P04102
12-16
1735

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.
 Remarks: _____ Drilling Area Background (ppm):

Converted to Well: Yes No Well I.D. #: _____

6-10
12-16
21-43



BORING LOG

PROJECT NAME: _____ BORING NUMBER: 035B04
 PROJECT NUMBER: _____ DATE: _____
 DRILLING COMPANY: _____ GEOLOGIST: _____
 DRILLING RIG: _____ DRILLER: _____

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)									
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**						
	25						Gray Sandy Clay												
									1.0										
							gray clayey sand												
				X			Brown wood debris												
				X			gray sandy clay												
									0.7										
							Brown wood debris ^{frass} contact												
							Light/whit sandy clay												
									0.5										
									0.9										
							White FS												
									0.7										
									0.5										
							shale clay 6"												
									0.7										

036-P400:
42-44
1715

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #: _____



BORING LOG

PROJECT NAME: C-PT 3 RI BORING NUMBER: 03GB05
 PROJECT NUMBER: 112600464 DATE: 10-12-06
 DRILLING COMPANY: MTW GEOLOGIST: W.D. Olson
 DRILLING RIG: DPT DRILLER: D. Dunca

Sample No. and Type or RQD	Depth (Ft) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft) or Screened Interval	MATERIAL DESCRIPTION		U S C S *	Remarks	PID/FID Reading (ppm)				
					Soil Density/Consistency or Rock Hardness	Color			Material Classification	Sample	Sampler BZ	Borehole**	Driller BZ**
								PID/APP					
						Brown silty sand		0.9					
						Orange clay							
						brown @ contact		1.4					
						gray silty FS		1.1					
5						Brown clayey silt		1.1					
						white FS		2.4					
10								1.9					
								2.5					
15								1.2					
						grades to lt. gray		0.8					
						BRN FS		0.9					
20						gray sandy clay		0.9					
								0.9					
25								0.8					

03G-P0501
10-12
1328

03G-P0502
16-18'
1320

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.
 Remarks: _____
 Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No X Well I.D. #: _____



BORING LOG

PROJECT NAME: _____ BORING NUMBER: 033B05
 PROJECT NUMBER: _____ DATE: _____
 DRILLING COMPANY: _____ GEOLOGIST: _____
 DRILLING RIG: _____ DRILLER: _____

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION		USCS*	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color			Material Classification	Sample	Sampler BZ	Borehole**
	25							PIA PPM				
						gray sandy clay		0.8				
						some int. sandier & some clayier		1.1				
	30					gray sandy clay		0.8				
						wood frags @ 34'		0.7				
								1.0				
	35					gray sandy clay		0.6				
								0.5				
								0.6				
	40					clayey gray FS @ 39.5'						
						grades to fine to med g.t. sand, gray						
	45											
	50					green Plastic clay						

036-P050
43-45
1300

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____ Drilling Area Background (ppm):

Converted to Well: Yes _____ No _____ Well I.D. #: _____

50-55 - green plastic clay



BORING LOG

PROJECT NAME: GPT 3 RI BORING NUMBER: 035806
 PROJECT NUMBER: 112G00464 DATE: 10-12-06
 DRILLING COMPANY: M+W GEOLOGIST: W.D. Olson
 DRILLING RIG: DPI DRILLER: A. Duncan

Sample No. and Type or BGD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
									DID/APM				
									0.7				
									1.2				
									wet 0.4				
									0.5				
									0.5				
									0.4				
									0.5				
									0.4				
									0.5				
									0.4				
									0.5				
									0.4				
									0.4				
									0.4				

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.
 Remarks: _____
 Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well ID #: _____



BORING LOG

PROJECT NAME: _____ BORING NUMBER: 03 SB06
 PROJECT NUMBER: _____ DATE: _____
 DRILLING COMPANY: _____ GEOLOGIST: _____
 DRILLING RIG: _____ DRILLER: _____

Sample No. and Type or RQD	Depth (FT.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FT.) or Screened Interval	MATERIAL DESCRIPTION			U S C S *	Remarks	PID/FID Reading (ppm)								
					Soil Density/ Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole*	Driller BZ*					
	25						gray silty clay sandier close to 30'											
										0.3								
										0.4								
	30									0.6								
										0.9								
										0.9								
	35									0.5								
										0.4								
										0.4								
										0.5								
	40																	
	45																	

03G-P0801
 40-44
 1637

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____ Drilling Area Background (ppm): _____

Converted to Well: Yes _____ No _____ Well I.D. #: _____



BORING LOG

PROJECT NAME: GPT 3 RI
 PROJECT NUMBER: 112600464
 DRILLING COMPANY: MFW
 DRILLING RIG: DDT

BORING NUMBER: 035B07
 DATE: 10-13-06
 GEOLOGIST: W.D. O'Son
 DRILLER: D. Duncu

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			U S C S	Remarks	PID/FID Reading (ppm)			
					Soil Density/ Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
									PID/PPM				
									6.1				
									1.1				
									moist LV				
									4.0				
									wet @ 6'				
									5.9				
									6.5				
									6.7				
									4.6				
									6.1				
									5.8				
									4.7				

5
10
15
20
25

036P070
11207-9
6-12-06
11-13
036P070
14-16
16-18
18-21
15-17
036P070
1056

* When rock coring, enter rock brokenness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated response read.

Remarks: _____

Drilling Area Background (ppm):

Converted to Well: Yes No Well I.D.#: _____



BORING LOG

PROJECT NAME: GPT 3 R1
 PROJECT NUMBER: 112600464
 DRILLING COMPANY: m+w
 DRILLING RIG: DPT

BORING NUMBER: 035B08
 DATE: 10-13-06
 GEOLOGIST: W.D. Olson
 DRILLER: D. Duncan

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION			USCS*	Remarks	PID/FID Reading (ppm)			
					Soil Density/Consistency or Rock Hardness	Color	Material Classification			Sample	Sampler BZ	Borehole**	Driller BZ**
							Brown Silty FS		5.3				
							gray silty FS						
							some black sand rock frags		6.8				
							tan FS + silt		5.4				
							grades to ↓						
							white FS		6.5				
							↓		5.4				
							↓		3.9				
							↓		5.5				
							↓		5.6				
							grades to tan/ and orange FS		3.8				
							gray FS		6.7				
							gray sandy clay		7.3				
							↓		6.8				
							↓		6.5				

8-10
 13-15
 14-12
 035B08
 18-20
 1400

* When rock coring, enter rock brokenness.
 ** Include monitor reading in 6 foot intervals @ borehole... Increase reading frequency if elevated response read.
 Remarks: _____
 Drilling Area Background (ppm): _____
 Converted to Well: Yes _____ No _____ Well I.D. #: _____



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB0101
Sample Location: GPT-03-MW20
Sampled By: Bill Olson
C.O.C. No.:

- Surface Soil
- Subsurface Soil
- Sediment
- Other:
- QA Sample Type:

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: 08/14/07	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1515	6-11'	White	Sand
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	Encore	3	
SVOC/Pest/PCB/Herb	8oz Glass	1	
Metals/CN	4oz Glass	1	

OBSERVATIONS / NOTES:

MAP:

Empty box for Observations / Notes.

Empty box for Map.

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:

Empty box for Signature(s).



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB0201
Sample Location: GPT-03-MW18
Sampled By: Jason Bourgeois
C.O.C. No.:

- Surface Soil
Subsurface Soil
Sediment
Other:
QA Sample Type:

Type of Sample:
Low Concentration
High Concentration

GRAB SAMPLE DATA:

Table with 4 columns: Date, Depth Interval, Color, Description. Includes data for Date: 08/14/07, Depth: 2-7', Color: 2-6' reddish white, 6-7' dark brown, Description: silty sand, sandy silt.

COMPOSITE SAMPLE DATA:

Table with 5 columns: Date, Time, Depth Interval, Color, Description. Includes rows for Method and Monitor Readings.

SAMPLE COLLECTION INFORMATION:

Table with 4 columns: Analysis, Container Requirements, Collected, Other. Includes rows for VOC, SVOC/Pest/PCB/Herb, and Metals/CN.

OBSERVATIONS / NOTES:

MAP:

Large empty rectangular area for observations, notes, and map.

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB0301
Sample Location: GPT-03-MW21
Sampled By: Jason Bourgeois
C.O.C. No.:

- Surface Soil
- Subsurface Soil
- Sediment
- Other:
- QA Sample Type:

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:08/15/07	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:0954	3-7'	whitish gray	silty sand
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	Encore	3	
SVOC/Pest/PCB/Herb	8oz Glass	1	
Metals/CN	4oz Glass	1	

OBSERVATIONS / NOTES:

MAP:

Large empty box for observations and notes.

Large empty box for map.

Circle if Applicable:

Signature(s):

MS/MSD Duplicate ID No.:

MS/MSD

Duplicate ID No.:

Signature(s):



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB0401
Sample Location: GPT-03-MW22
Sampled By: Jason Bourgeois
C.O.C. No.:

- Surface Soil
- Subsurface Soil
- Sediment
- Other:
- QA Sample Type:

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:08/15/07	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:1125	3-8'	tan/gray	clay silt w/ sand
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	Encore	3	
SVOC/Pest/PCB/Herb	8oz Glass	1	
Metals/CN	4oz Glass	1	

OBSERVATIONS / NOTES:

MAP:

Large empty box for observations and notes.

Large empty box for map.

Circle if Applicable:

Signature(s):

MS/MSD Duplicate ID No.:

Large empty box for MS/MSD and Duplicate ID No.

Large empty box for signature.



Project Site Name: NCBC GULFPORT
 Project No.: CTO 041

Surface Soil
 Subsurface Soil
 Sediment
 Other: _____
 QA Sample Type: _____

Sample ID No.: 03SB0501
 Sample Location: GPT-03-MW23
 Sampled By: Jason Bourgeois
 C.O.C. No.: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: 08/15/07	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1330	3-8'	whitish/gray	silty clayey sand
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	Encore	3	
SVOC/Pest/PCB/Herb	8oz Glass	1	
Metals/CN	4oz Glass	1	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB0601
Sample Location: GPT-03-MW26
Sampled By: Jason Bourgeois
C.O.C. No.:

- Surface Soil
Subsurface Soil
Sediment
Other:
QA Sample Type:

Type of Sample:
Low Concentration
High Concentration

GRAB SAMPLE DATA:

Table with 4 columns: Date, Depth Interval, Color, Description. Data: 08/16/07, 3-8', redish-gray, clayey sand.

COMPOSITE SAMPLE DATA:

Table with 5 columns: Date, Time, Depth Interval, Color, Description. Includes rows for Method and Monitor Readings.

SAMPLE COLLECTION INFORMATION:

Table with 4 columns: Analysis, Container Requirements, Collected, Other. Rows for VOC, SVOC/Pest/PCB/Herb, Metals/CN.

OBSERVATIONS / NOTES:

MAP:

Large empty box for observations and notes.

Large empty box for map.

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:

Signature area with a large empty space.



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB0701
Sample Location: GPT-03-MW28
Sampled By: Jason Bourgeois
C.O.C. No.:

- Surface Soil
Subsurface Soil
Sediment
Other:
QA Sample Type:

Type of Sample:
Low Concentration
High Concentration

GRAB SAMPLE DATA:

Table with columns: Date, Time, Method, Monitor Reading, Depth Interval, Color, Description. Includes data for 08/16/07, 1100, DPT, 0.0 ppm, 3-8' depth, and color descriptions.

COMPOSITE SAMPLE DATA:

Table with columns: Date, Time, Depth Interval, Color, Description. Includes rows for Date, Method, and Monitor Readings.

SAMPLE COLLECTION INFORMATION:

Table with columns: Analysis, Container Requirements, Collected, Other. Includes rows for VOC, SVOC/Pest/PCB/Herb, and Metals/CN.

OBSERVATIONS / NOTES:

sample collected at 3-6' bls

MAP:

Blank area for map or additional notes.

Circle if Applicable:

MS/MSD Duplicate ID No.:

Signature(s):

Blank area for signature.



Project Site Name: NCBC GULFPORT
 Project No.: CTO 041

Surface Soil
 Subsurface Soil
 Sediment
 Other: _____
 QA Sample Type: _____

Sample ID No.: 03SB0801
 Sample Location: GPT-03-MW29
 Sampled By: Jason Bourgeois
 C.O.C. No.: _____

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date: 08/16/07	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1550	3-8'	whitish gray	silty sand
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	Encore	3	
SVOC/Pest/PCB/Herb	8oz Glass	1	
Metals/CN	4oz Glass	1	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

Signature(s):

MS/MSD

Duplicate ID No.:



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB0901
Sample Location: See Notes
Sampled By: Jason Bourgeois
C.O.C. No.:

- Surface Soil
- Subsurface Soil
- Sediment
- Other:
- QA Sample Type:

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:08/17/07	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:0820	3-8'	whitish gray	silty sand
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	Encore	3	
SVOC/Pest/PCB/Herb	8oz Glass	1	
Metals/CN	4oz Glass	1	

OBSERVATIONS / NOTES:

collected 20' North of GPT-03-16

MAP:

Circle if Applicable:

MS/MSD Duplicate ID No.: 03SB0901D

Signature(s):



Project Site Name: NCBC GULFPORT
Project No.: CTO 041

Sample ID No.: 03SB1001
Sample Location: See Notes
Sampled By: Jason Bourgeois
C.O.C. No.:

- Surface Soil
- Subsurface Soil
- Sediment
- Other:
- QA Sample Type:

Type of Sample:
 Low Concentration
 High Concentration

GRAB SAMPLE DATA:

Date:08/17/07	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:0900	3-8'	whitish gray	silty sand
Method: DPT			
Monitor Reading (ppm): 0.0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	Encore	3	
SVOC/Pest/PCB/Herb	8oz Glass	1	
Metals/CN	4oz Glass	1	

OBSERVATIONS / NOTES:

collected 20' North of 03SB0901

MAP:

Circle if Applicable:

MS/MSD
03SB1001MS/MSD Duplicate ID No.:

Signature(s):



Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: GPT Project No.: 1126
 Location: Site 3 R1 Personnel: W.D. Olson
 Weather Conditions: Cloudy, occ. rain Measuring Device: WLI
 Tidally Influenced: Yes No Remarks: _____

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
2143	10-30	0922		29.30	3.64	~		2"
SG-1	10-30	0927		—	2.38	—		Staff gauge in casing
2154	10-30	0931		34.55	1.43	—		1"
2155	10-30	0935		19.36	1.97	—		1"
2162	10-30	0939		19.55	1.13	—		2"
2151	10/30	0944		23.72	2.37	—		1"
2152	10/30	0946		34.52	1.76	—		1"
2153	10/30	0949		40.66	1.52	—		1"
2132	10/30	0958		26.59	3.05	—		2" - ABB
2148	10/30	1005		29.19	5.76	—		1"
SG-2	10/30	1010		—	4.08	—		1" N. POW
2146	10/30	1012		29.23	3.63	—		2"
2145	10/30	1014		40.04	3.42	—		1"
2134	10/30	1022		14.40	2.71	—		2" ABB
2147	10/30	1026		29.52	2.87	—		1"
2149	10/30	1031		29.27	2.99	—		1"
2133	10/30	1036		23.37	1.74	—		2" ABB
2136	10/30	1040		29.45	2.23	—		1"
2135	10/30	1055		20.14	1.60	—		2"
2160	10/30	1059		25.39	2.49	—		2"
2158	10/30	1104		24.95	1.99	—		2"
2159	10/30	1107		49.65	2.56	—		1"
2161	10/30	1115		19.88	3.07	—		2"
2166	10/30	1121		24.39	3.53	—		2"
SG-3	10/30	1126		—	4.70	—		Golf Links

* All measurements to the nearest 0.01 foot

APPENDIX C

VALIDATED LABORATORY DATA



KB LABS, INC.
6821 Southwest Archer Road
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October 20, 2006

Jason Bourgeois
TtNUS
3360 Capital Circle, NE Suite B
Tallahassee, FL 32308

**RE: NCBC Gulfport, Gulfport MS, - Final Data Report
KB Labs Project # 06-249**

Dear Mr. Bourgeois:

Enclosed is the final report of the on-site analysis performed by KB Labs, Inc. at the above referenced site. Samples were collected and analyzed from October 10 to 17, 2006. Included are a brief project narrative, and data report narrative, tables listing quality control results, final analytical results, and sample chain-of-custody form. This information will also be sent electronically.

KB Labs' mobile laboratories have been inspected by the FDOH Bureau of Laboratories and are NELAP Certified as of April 1, 2003. Our personnel, methodology, proficiency testing, and quality assurance requirements comply with the guidelines of Chapter 62-160 of the Florida Administrative Code and with the consensus standards adopted at the National Environmental Laboratory Accreditation Conference (NELAC). Data for the site referenced above were determined in accordance with published procedures under Test Methods for Evaluating Solid Waste (EPA SW-846, Update III Revised May 1997). Unless otherwise indicated on the quality control narrative accompanying the data report, the quality assurance and quality control procedures performed in conjunction with analysis of groundwater samples demonstrated that the reported data met our requirements for accuracy and precision under NELAC Standards.

If you have any questions, please do not hesitate to call me or Kelly Bergdoll, President of KB Labs, at (352) 367-0073.

Sincerely,

KB Labs, Inc.

Todd Romero
Director of Operations

"KB Labs is a small, woman-owned business enterprise."



KB Labs, Inc.
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Gainesville, FL 32608
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PROJECT NARRATIVE

Project Scope

From October 10 to 17, 2006, a total of 81 samples (81 water) were analyzed for TtNUS at NCBC Gulfport, Gulfport MS. The samples were analyzed for dichlorodifluoromethane, chloromethane, vinyl chloride, bromomethane, chloroethane, trichlorofluoromethane, freon 113, 1,1-dichloroethene, acetone, carbon disulfide, methylene chloride, t-1,2-dichloroethene, mtbe, 1,1-dichloroethane, c-1,2-dichloroethene, 2-butanone, chloroform, 1,1,1-trichloroethane, carbon tetrachloride, benzene, 1,2-dichloroethane, trichloroethene, 1,2-dichloropropane, bromodichloromethane, c-1, 3-dichloropropene, 4-methyl-2-pentanone, toluene, t-1,3-dichloropropene, 1,1,2-trichloroethane, tetrachloroethene, 2-hexanone, dibromochloromethane, 1,2-dibromoethane, chlorobenzene, ethylbenzene, xylenes, styrene, bromoform, Isopropylbenzene, 1,1,2,2-tetrachloroethane, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2-dibromo-3-chloropropane, and 1,2,4-trichlorobenzene.

NELAP Certification

KB Mobile Labs Unit KB1: FDOH NELAP Certification Number E82815

Analytical Procedure

All samples were analyzed using SW846 Method 5030/8260 for waters. Ten (10) milliliters (mL) of water or air (air samples) were purged with helium and the volatile organic compounds (VOCs) were collected on a solid-phase adsorption trap. The adsorption trap was heated and back-purged with helium. The components were then separated by capillary column gas chromatography and measured with a mass spectrometer (GC/MS) operated in the electron impact full-scan mode. The individual VOCs in the samples were measured against corresponding VOC standards.

Analytical Results

Laboratory results were provided to the client on an as-completed or next-day basis. Final results of the on-site analyses are provided in a hardcopy report. The data produced and reported in the field has been reviewed and approved for this final report by the Director of Operations for KB Labs.

Quality Control (QC) Data

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Surrogate Recoveries – Table 1 lists the daily analytical sequence and percent recovery results for surrogate compounds, which were added to all analyses. Four (4) surrogate compounds were added to each analysis in order to continually monitor general method performance.

VOC Spike Recoveries – Table 2 lists the percent recovery results for matrix spike and laboratory control samples. A known amount of each target compound was added to selected field samples and to laboratory reagent water in order to monitor the performance of each of the target compounds in the actual matrix and in laboratory reagent water.

Method Blanks – Daily analysis of laboratory reagent water samples was performed in order to monitor the cleanliness of the analytical system.

DATA REPORT NARRATIVE

1. All sample data has been reviewed and, if required, updated in the Final Data Report for rounding and significant figures.
2. The vinyl chloride and cis-1,2-dichloroethene results for samples 03GP1201 and 03GP1204 were transposed in the Preliminary Results.
3. Sample ID 03GP1202 reported vinyl chloride <1.0 ug/L changed to 23ug/L.
4. Sample ID 03GP1202 reported c-1, 2-dichloroethene <1.0 ug/L changed to 20.6ug/L.
5. Sample ID 03GP1601 reported vinyl chloride <1.0 ug/L changed to 6.5ug/L.
6. Sample ID 03GP1602 reported c-1, 2-dichloroethene <1.0 ug/L changed to 12.5ug/L.
7. Sample ID 03GP1903 reported trichloroethene 5.6 changed to 4.6ug/L.
8. Sample ID 03GP2204 reported c-1, 2-dichloroethene 280 changed to 430ug/L.
9. Ethylbenzene was not reported on the Preliminary result sheets. No hits reported.

“KB Labs is a small, woman-owned business enterprise.”

KB LABS, INC.

Table 1: Analytical Run Sequence/Surrogate Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Glenn Jackson
Site: NCBC Gulfport	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No: 06-249
On-site Dates: 10/10/06-10/17/06	Client Project Manager: Jason Bourgeois	Matrix: Water

Sample ID	Date of Analysis	Surrogate % Recovery				Surrogate Control Limits			
		S1*	S2*	S3*	S4*	S1*	S2*	S3*	S4*
BLANK WATER	10/10/06	100	100	89	92	Pass	Pass	Pass	Pass
BLANK WATER	10/10/06	109	103	88	90	Pass	Pass	Pass	Pass
VSTD 1	10/10/06	49	84	105	97	< LCL	Pass	Pass	Pass
VSTD 5	10/10/06	113	110	104	98	Pass	Pass	Pass	Pass
VSTD 10	10/10/06	101	112	102	101	Pass	Pass	Pass	Pass
VSTD 20	10/10/06	59	102	102	103	< LCL	Pass	Pass	Pass
RSTD 20	10/10/06	105	103	104	102	Pass	Pass	Pass	Pass
VSTD 50	10/10/06	105	95	99	100	Pass	Pass	Pass	Pass
VSTD 100	10/10/06	106	97	87	100	Pass	Pass	Pass	Pass
BLANK WATER	10/10/06	114	102	104	97	Pass	Pass	Pass	Pass
BLANK WATER	10/10/06	115	110	105	98	Pass	Pass	Pass	Pass
03GP0101	10/10/06	113	98	108	100	Pass	Pass	Pass	Pass
VSTD 20	10/11/06	98	88	104	108	Pass	Pass	Pass	Pass
RSTD 20	10/11/06	102	87	107	109	Pass	Pass	Pass	Pass
BLANK WATER	10/11/06	108	100	110	100	Pass	Pass	Pass	Pass
03GP0101	10/11/06	109	96	106	100	Pass	Pass	Pass	Pass
03GP0102	10/11/06	109	94	106	100	Pass	Pass	Pass	Pass
03GP0103	10/11/06	111	97	106	98	Pass	Pass	Pass	Pass
03GP0101 MSD	10/11/06	109	95	103	102	Pass	Pass	Pass	Pass
03GP0101 MS	10/11/06	106	91	103	103	Pass	Pass	Pass	Pass
03GP0201	10/11/06	109	97	104	96	Pass	Pass	Pass	Pass
03GP0202	10/11/06	108	98	105	93	Pass	Pass	Pass	Pass
03GP0203 1:10	10/11/06	106	106	105	103	Pass	Pass	Pass	Pass
03GP0201 1:10	10/11/06	112	102	105	98	Pass	Pass	Pass	Pass
03GP0202 1:10	10/11/06	40	103	101	98	< LCL	Pass	Pass	Pass
03GP0301 1:10	10/11/06	114	108	104	96	Pass	Pass	Pass	Pass
03GP0302 1:10	10/11/06	99	108	104	98	Pass	Pass	Pass	Pass
03GP0203 1:10	10/11/06	5	100	106	97	< LCL	Pass	Pass	Pass
BLANK WATER	10/11/06	111	104	106	96	Pass	Pass	Pass	Pass
03GP0303	10/11/06	109	102	106	94	Pass	Pass	Pass	Pass
BLANK WATER	10/11/06	106	90	107	96	Pass	Pass	Pass	Pass
VSTD 20	10/11/06	108	97	99	103	Pass	Pass	Pass	Pass
VSTD 20	10/12/06	97	85	104	108	Pass	Pass	Pass	Pass
RSTD 20	10/12/06	106	90	104	105	Pass	Pass	Pass	Pass
BLANK WATER	10/12/06	112	97	106	96	Pass	Pass	Pass	Pass
03GP0402	10/12/06	103	93	105	100	Pass	Pass	Pass	Pass
03GP0402 MS	10/12/06	104	89	102	105	Pass	Pass	Pass	Pass
03GP0402 MSD	10/12/06	109	92	100	104	Pass	Pass	Pass	Pass

***Surrogate Compounds:**

- S1 = Dibromofluoromethane (70%-130%)
- S2 = 1,2- Dichloroethane-D4 (48% - 147%)
- S3 = Toluene-D8 (82% - 116%)
- S4 = 4-Bromofluorobenzene (65% - 133%)

KB LABS, INC.

Table 1: Analytical Run Sequence/Surrogate Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Glenn Jackson
Site: NCBC Gulfport	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No: 06-249
On-site Dates: 10/10/06-10/17/06	Client Project Manager: Jason Bourgeois	Matrix: Water

Sample ID	Date of Analysis	Surrogate % Recovery				Surrogate Control Limits			
		S1*	S2*	S3*	S4*	S1*	S2*	S3*	S4*
03GP0403	10/12/06	111	93	107	96	Pass	Pass	Pass	Pass
03GP0501	10/12/06	108	100	104	97	Pass	Pass	Pass	Pass
03GP0502	10/12/06	110	102	103	95	Pass	Pass	Pass	Pass
03GP0503	10/12/06	116	103	102	99	Pass	Pass	Pass	Pass
VSTD 20	10/12/06	91	77	98	99	Pass	Pass	Pass	Pass
VSTD 20	10/13/06	106	89	104	109	Pass	Pass	Pass	Pass
RSTD 20	10/13/06	107	87	102	105	Pass	Pass	Pass	Pass
BLANK WATER	10/13/06	113	96	103	98	Pass	Pass	Pass	Pass
03GP0601	10/13/06	108	96	105	99	Pass	Pass	Pass	Pass
03GP0603	10/13/06	114	96	103	95	Pass	Pass	Pass	Pass
03GP0603 MS	10/13/06	103	84	102	105	Pass	Pass	Pass	Pass
03GP0603 MSD	10/13/06	106	87	101	105	Pass	Pass	Pass	Pass
03GP0602	10/13/06	114	98	105	104	Pass	Pass	Pass	Pass
03GP0701	10/13/06	110	94	106	99	Pass	Pass	Pass	Pass
03GP0702	10/13/06	112	92	102	98	Pass	Pass	Pass	Pass
03GP0703	10/13/06	113	95	105	98	Pass	Pass	Pass	Pass
03GP0804	10/13/06	120	112	121	132	Pass	Pass	> UCL	Pass
03GP0803	10/13/06	115	102	104	100	Pass	Pass	Pass	Pass
03GP0802	10/13/06	115	98	103	98	Pass	Pass	Pass	Pass
03GP0801	10/13/06	115	98	103	97	Pass	Pass	Pass	Pass
03GP0903	10/13/06	111	93	103	98	Pass	Pass	Pass	Pass
03GP0902	10/13/06	98	96	101	95	Pass	Pass	Pass	Pass
03GP0901	10/13/06	113	95	105	98	Pass	Pass	Pass	Pass
VSTD 20	10/13/06	105	87	100	102	Pass	Pass	Pass	Pass
VSTD 20	10/14/06	108	96	104	108	Pass	Pass	Pass	Pass
RSTD 20	10/14/06	107	96	101	104	Pass	Pass	Pass	Pass
BLANK WATER	10/14/06	115	95	103	98	Pass	Pass	Pass	Pass
03GP1001	10/14/06	115	94	104	98	Pass	Pass	Pass	Pass
03GP1002	10/14/06	114	90	104	100	Pass	Pass	Pass	Pass
03GP1003	10/14/06	114	95	107	100	Pass	Pass	Pass	Pass
03GP1004	10/14/06	116	99	102	99	Pass	Pass	Pass	Pass
03GP1001 MS	10/14/06	108	86	99	102	Pass	Pass	Pass	Pass
03GP1001 MSD	10/14/06	110	89	100	104	Pass	Pass	Pass	Pass
03GP1101	10/14/06	114	96	103	101	Pass	Pass	Pass	Pass
03GP1102	10/14/06	115	96	102	100	Pass	Pass	Pass	Pass
03GP1103 1:5	10/14/06	118	100	100	99	Pass	Pass	Pass	Pass
03GP1104 1:10	10/14/06	116	100	102	97	Pass	Pass	Pass	Pass
03GP1103	10/14/06	112	92	102	98	Pass	Pass	Pass	Pass

***Surrogate Compounds:**

- S1 = Dibromofluoromethane (70%-130%)
- S2 = 1,2- Dichloroethane-D4 (48% - 147%)
- S3 = Toluene-D8 (82% - 116%)
- S4 = 4-Bromofluorobenzene (65% - 133%)

KB LABS, INC.

Table 1: Analytical Run Sequence/Surrogate Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Glenn Jackson
Site: NCBC Gulfport	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No: 06-249
On-site Dates: 10/10/06-10/17/06	Client Project Manager: Jason Bourgeois	Matrix: Water

Sample ID	Date of Analysis	Surrogate % Recovery				Surrogate Control Limits			
		S1*	S2*	S3*	S4*	S1*	S2*	S3*	S4*
03GP1104	10/14/06	117	99	102	99	Pass	Pass	Pass	Pass
03GP1204	10/14/06	96	86	96	94	Pass	Pass	Pass	Pass
03GP1203	10/14/06	119	106	100	98	Pass	Pass	Pass	Pass
03GP1202	10/14/06	118	102	100	101	Pass	Pass	Pass	Pass
03GP1201 1:10	10/14/06	116	97	101	97	Pass	Pass	Pass	Pass
VSTD 20	10/14/06	110	92	96	105	Pass	Pass	Pass	Pass
VSTD 20	10/15/06	105	84	100	104	Pass	Pass	Pass	Pass
RSTD 20	10/15/06	110	85	100	104	Pass	Pass	Pass	Pass
BLANK WATER	10/15/06	99	91	124	102	Pass	Pass	> UCL	Pass
03GP1201	10/15/06	96	93	122	100	Pass	Pass	> UCL	Pass
03GP1204 MS	10/15/06	108	97	103	106	Pass	Pass	Pass	Pass
03GP1204 MSD	10/15/06	109	86	100	102	Pass	Pass	Pass	Pass
03GP1303	10/15/06	101	87	98	95	Pass	Pass	Pass	Pass
03GP1302	10/15/06	120	100	101	99	Pass	Pass	Pass	Pass
03GP1301	10/15/06	112	93	101	98	Pass	Pass	Pass	Pass
03GP1404	10/15/06	97	93	119	99	Pass	Pass	> UCL	Pass
03GP1403	10/15/06	99	93	120	99	Pass	Pass	> UCL	Pass
03GP1402	10/15/06	98	97	121	100	Pass	Pass	> UCL	Pass
03GP1401	10/15/06	98	92	120	97	Pass	Pass	> UCL	Pass
03GP1503	10/15/06	94	94	122	101	Pass	Pass	> UCL	Pass
03GP1502	10/15/06	98	91	120	100	Pass	Pass	> UCL	Pass
03GP1501	10/15/06	98	90	120	99	Pass	Pass	> UCL	Pass
03GP1604	10/15/06	95	94	122	108	Pass	Pass	> UCL	Pass
03GP1603	10/15/06	96	96	127	109	Pass	Pass	> UCL	Pass
03GP1602 1:5	10/15/06	96	92	125	102	Pass	Pass	> UCL	Pass
03GP1601	10/15/06	98	92	124	101	Pass	Pass	> UCL	Pass
VSTD 20	10/15/06	111	90	100	106	Pass	Pass	Pass	Pass
RSTD 20	10/16/06	118	98	93	99	Pass	Pass	Pass	Pass
VSTD 20	10/16/06	117	94	92	104	Pass	Pass	Pass	Pass
BLANK WATER	10/16/06	101	99	120	99	Pass	Pass	> UCL	Pass
03GP1601 MS	10/16/06	112	92	94	100	Pass	Pass	Pass	Pass
03GP1601 MSD	10/16/06	107	86	93	98	Pass	Pass	Pass	Pass
03GP1701	10/16/06	85	99	118	98	Pass	Pass	> UCL	Pass
03GP1702	10/16/06	122	99	96	95	Pass	Pass	Pass	Pass
03GP1703	10/16/06	121	102	96	99	Pass	Pass	Pass	Pass
03GP1704	10/16/06	124	100	97	99	Pass	Pass	Pass	Pass
03GP1801	10/16/06	98	99	117	97	Pass	Pass	> UCL	Pass
03GP1802	10/16/06	97	95	116	98	Pass	Pass	Pass	Pass

***Surrogate Compounds:**

- S1 = Dibromofluoromethane (70%-130%)
- S2 = 1,2- Dichloroethane-D4 (48% - 147%)
- S3 = Toluene-D8 (82% - 116%)
- S4 = 4-Bromofluorobenzene (65% - 133%)

KB LABS, INC.

Table 1: Analytical Run Sequence/Surrogate Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Glenn Jackson
Site: NCBC Gulfport	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No: 06-249
On-site Dates: 10/10/06-10/17/06	Client Project Manager: Jason Bourgeois	Matrix: Water

Sample ID	Date of Analysis	Surrogate % Recovery				Surrogate Control Limits			
		S1*	S2*	S3*	S4*	S1*	S2*	S3*	S4*
03GP1803	10/16/06	97	97	116	98	Pass	Pass	Pass	Pass
03GP1804	10/16/06	96	98	116	103	Pass	Pass	Pass	Pass
03GP1803 1:5	10/16/06	98	99	116	98	Pass	Pass	Pass	Pass
03GP1904	10/16/06	98	93	117	98	Pass	Pass	> UCL	Pass
03GP1903 1:2	10/16/06	96	93	116	98	Pass	Pass	Pass	Pass
03GP1901	10/16/06	96	97	117	97	Pass	Pass	> UCL	Pass
03GP1902 1:2	10/16/06	96	94	117	97	Pass	Pass	> UCL	Pass
03GP2003	10/16/06	97	95	115	98	Pass	Pass	Pass	Pass
03GP2002	10/16/06	99	97	119	96	Pass	Pass	> UCL	Pass
03GP2001	10/16/06	98	94	119	96	Pass	Pass	> UCL	Pass
03GP2004	10/16/06	99	98	119	98	Pass	Pass	> UCL	Pass
03GP2104 Rerun	10/16/06	134	150	117	95	> UCL	> UCL	> UCL	Pass
03GP2103 1:2	10/16/06	97	96	118	97	Pass	Pass	> UCL	Pass
03GP2102 1:5	10/16/06	99	100	116	95	Pass	Pass	Pass	Pass
03GP2101 1:5	10/16/06	99	99	116	98	Pass	Pass	Pass	Pass
VSTD 20	10/16/06	117	98	92	102	Pass	Pass	Pass	Pass
VSTD 20	10/17/06	114	96	90	97	Pass	Pass	Pass	Pass
RSTD 20	10/17/06	125	104	89	100	Pass	Pass	Pass	Pass
BLANK WATER	10/17/06	101	104	116	97	Pass	Pass	Pass	Pass
03GP2104	10/17/06	100	101	116	98	Pass	Pass	Pass	Pass
03GP2201	10/17/06	100	98	117	97	Pass	Pass	> UCL	Pass
03GP2202	10/17/06	100	100	117	95	Pass	Pass	> UCL	Pass
03GP2203	10/17/06	101	102	118	96	Pass	Pass	> UCL	Pass
03GP2204	10/17/06	98	99	117	96	Pass	Pass	> UCL	Pass
03GP2203 1:2	10/17/06	97	91	118	95	Pass	Pass	> UCL	Pass
03GP2204 1:5	10/17/06	141	158	117	92	> UCL	> UCL	> UCL	Pass
03GP2301	10/17/06	99	97	118	98	Pass	Pass	> UCL	Pass
03GP2302	10/17/06	141	159	119	92	> UCL	> UCL	> UCL	Pass
03GP2303	10/17/06	62	71	118	94	< LCL	Pass	> UCL	Pass
03GP2304	10/17/06	102	100	118	95	Pass	Pass	> UCL	Pass
VSTD 20	10/17/06	126	99	89	101	Pass	Pass	Pass	Pass

Comments: Although some surrogates may be out of the control percent recovery range, other supporting QC, such as matrix spikes, matrix spike duplicates, method blanks, and laboratory control samples, are performed by KB Labs to further validate reported data.

***Surrogate Compounds:**

- S1 = Dibromofluoromethane (70%-130%)
- S2 = 1,2- Dichloroethane-D4 (48% - 147%)
- S3 = Toluene-D8 (82% - 116%)
- S4 = 4-Bromofluorobenzene (65% - 133%)

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Glenn Jackson
Site: NCBC Gulfport	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-249
On-site Dates: 10/10/06-10/17/06	Client Project Manager: Jason Bourgeois	Matrix: Water

Matrix Spike/Matrix Spike Duplicate (MS/MSD):

Samples: 03GP0101MS 03GP0101MSD		Date of Analysis: 10/11/2006							
Matrix Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	RPD	MS	MSD	RPD	MS	MSD	RPD
Dichlorodifluoromethane	90	120	20	135	150	11	> UCL	> UCL	Pass
Chloromethane	39	142	20	102	114	12	Pass	Pass	Pass
Vinyl Chloride	20	187	20	95	105	10	Pass	Pass	Pass
Bromomethane	70	130	20	106	117	10	Pass	Pass	Pass
Chloroethane	70	130	20	187	193	3	> UCL	> UCL	Pass
Trichlorofluoromethane	56	149	20	138	144	4	Pass	Pass	Pass
Freon 113	70	130	20	100	114	13	Pass	Pass	Pass
1,1-Dichloroethene	52	144	20	109	118	8	Pass	Pass	Pass
Acetone	70	130	20	58	98	52	< LCL	Pass	> RPD
Carbon Disulfide	70	130	20	107	120	11	Pass	Pass	Pass
Methylene Chloride	47	148	20	94	101	7	Pass	Pass	Pass
trans-1,2-Dichloroethene	41	157	20	100	111	10	Pass	Pass	Pass
Mtbe	60	145	20	81	96	17	Pass	Pass	Pass
1,1-Dichloroethane	69	134	20	97	107	10	Pass	Pass	Pass
cis-1,2-Dichloroethene	59	143	20	103	114	9	Pass	Pass	Pass
2-Butanone	70	130	20	75	91	20	Pass	Pass	Pass
Chloroform	64	148	20	101	112	11	Pass	Pass	Pass
1,1,1-Trichloroethane	53	147	20	107	115	7	Pass	Pass	Pass
Carbon Tetrachloride	51	161	20	107	118	10	Pass	Pass	Pass
Benzene	51	149	20	104	113	8	Pass	Pass	Pass
1,2-Dichloroethane	51	163	20	87	96	10	Pass	Pass	Pass
Trichloroethene	50	147	20	88	94	7	Pass	Pass	Pass
1,2-Dichloropropane	62	150	20	92	100	8	Pass	Pass	Pass
Bromodichloromethane	58	156	20	94	104	9	Pass	Pass	Pass
c-1,3-Dichloropropene	53	169	20	103	110	7	Pass	Pass	Pass
4-Methyl-2-Pentanone	70	130	20	70	86	21	< LCL	Pass	Pass
Toluene	60	136	20	103	112	8	Pass	Pass	Pass
t-1,3-Dichloropropene	72	154	20	101	111	9	Pass	Pass	Pass
1,1,2-Trichloroethane	64	144	20	99	110	10	Pass	Pass	Pass
Tetrachloroethene	56	138	20	102	109	6	Pass	Pass	Pass
2-Hexanone	70	130	20	72	90	22	Pass	Pass	Pass
Dibromochloromethane	69	147	20	100	107	8	Pass	Pass	Pass
1,2-Dibromoethane	70	130	20	92	103	11	Pass	Pass	Pass
Chlorobenzene	83	128	20	95	103	8	Pass	Pass	Pass
Ethylbenzene	60	143	20	110	119	8	Pass	Pass	Pass
m,p-Xylene	58	142	20	113	120	6	Pass	Pass	Pass
o-Xylene	57	145	20	108	117	8	Pass	Pass	Pass
Styrene	64	146	20	100	107	6	Pass	Pass	Pass
Bromoform	59	157	20	99	109	10	Pass	Pass	Pass
Isopropylbenzene	103	148	20	104	111	7	Pass	Pass	Pass
1,1,2,2-Tetrachloroethane	70	130	20	88	102	14	Pass	Pass	Pass
1,3-Dichlorobenzene	74	117	20	98	106	8	Pass	Pass	Pass
1,4-Dichlorobenzene	76	116	20	96	102	6	Pass	Pass	Pass
1,2-Dichlorobenzene	72	124	20	95	103	8	Pass	Pass	Pass
1,2-Dibromo-3-chloropropan	44	182	20	69	81	15	Pass	Pass	Pass
1,2,4-Trichlorobenzene	57	102	20	95	102	7	Pass	Pass	Pass

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit.

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Glenn Jackson
Site: NCBC Gulfport	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-249
On-site Dates: 10/10/06-10/17/06	Client Project Manager: Jason Bourgeois	Matrix: Water

Samples: 03GP0402 MS 03GP0402 MSD		Date of Analysis: 10/12/2006							
Matrix Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	RPD	MS	MSD	RPD	MS	MSD	RPD
Dichlorodifluoromethane	90	120	20	125	130	4	> UCL	> UCL	Pass
Chloromethane	39	142	20	100	101	1	Pass	Pass	Pass
Vinyl Chloride	20	187	20	91	94	4	Pass	Pass	Pass
Bromomethane	70	130	20	125	102	20	Pass	Pass	Pass
Chloroethane	70	130	20	179	152	16	> UCL	> UCL	Pass
Trichlorofluoromethane	56	149	20	138	134	3	Pass	Pass	Pass
Freon 113	70	130	20	113	116	2	Pass	Pass	Pass
1,1-Dichloroethene	52	144	20	110	111	1	Pass	Pass	Pass
Acetone	70	130	20	81	95	16	Pass	Pass	Pass
Carbon Disulfide	70	130	20	107	109	2	Pass	Pass	Pass
Methylene Chloride	47	148	20	90	96	7	Pass	Pass	Pass
trans-1,2-Dichloroethene	41	157	20	99	102	2	Pass	Pass	Pass
Mtbe	60	145	20	75	91	19	Pass	Pass	Pass
1,1-Dichloroethane	69	134	20	99	104	5	Pass	Pass	Pass
cis-1,2-Dichloroethene	59	143	20	103	107	4	Pass	Pass	Pass
2-Butanone	70	130	20	72	91	23	Pass	Pass	Pass
Chloroform	64	148	20	101	108	7	Pass	Pass	Pass
1,1,1-Trichloroethane	53	147	20	108	111	2	Pass	Pass	Pass
Carbon Tetrachloride	51	161	20	107	111	4	Pass	Pass	Pass
Benzene	51	149	20	102	107	4	Pass	Pass	Pass
1,2-Dichloroethane	51	163	20	85	96	12	Pass	Pass	Pass
Trichloroethene	50	147	20	88	88	0	Pass	Pass	Pass
1,2-Dichloropropane	62	150	20	89	95	6	Pass	Pass	Pass
Bromodichloromethane	58	156	20	91	98	7	Pass	Pass	Pass
c-1,3-Dichloropropene	53	169	20	89	104	16	Pass	Pass	Pass
4-Methyl-2-Pentanone	70	130	20	70	81	14	Pass	Pass	Pass
Toluene	60	136	20	103	107	4	Pass	Pass	Pass
t-1,3-Dichloropropene	72	154	20	88	106	19	Pass	Pass	Pass
1,1,2-Trichloroethane	64	144	20	96	105	9	Pass	Pass	Pass
Tetrachloroethene	56	138	20	101	106	5	Pass	Pass	Pass
2-Hexanone	70	130	20	70	84	19	< LCL	Pass	Pass
Dibromochloromethane	69	147	20	96	104	8	Pass	Pass	Pass
1,2-Dibromoethane	70	130	20	85	101	17	Pass	Pass	Pass
Chlorobenzene	83	128	20	95	99	5	Pass	Pass	Pass
Ethylbenzene	60	143	20	112	114	2	Pass	Pass	Pass
m,p-Xylene	58	142	20	111	115	3	Pass	Pass	Pass
o-Xylene	57	145	20	111	116	4	Pass	Pass	Pass
Styrene	64	146	20	99	102	3	Pass	Pass	Pass
Bromoform	59	157	20	96	105	9	Pass	Pass	Pass
Isopropylbenzene	103	148	20	107	110	3	Pass	Pass	Pass
1,1,2,2-Tetrachloroethane	70	130	20	68	92	30	< LCL	Pass	Pass
1,3-Dichlorobenzene	74	117	20	98	104	5	Pass	Pass	Pass
1,4-Dichlorobenzene	76	116	20	95	97	1	Pass	Pass	Pass
1,2-Dichlorobenzene	72	124	20	94	99	5	Pass	Pass	Pass
1,2-Dibromo-3-chloropropan	44	182	20	39	75	63	< LCL	Pass	> RPD
1,2,4-Trichlorobenzene	57	102	20	88	97	10	Pass	Pass	Pass

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit.

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Glenn Jackson
Site: NCBC Gulfport	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-249
On-site Dates: 10/10/06-10/17/06	Client Project Manager: Jason Bourgeois	Matrix: Water

Samples: 03GP0603 MS 03GP0603 MSD		Date of Analysis: 10/13/2006							
Matrix Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	RPD	MS	MSD	RPD	MS	MSD	RPD
Dichlorodifluoromethane	90	120	20	133	143	7	> UCL	> UCL	Pass
Chloromethane	39	142	20	105	101	4	Pass	Pass	Pass
Vinyl Chloride	20	187	20	99	95	4	Pass	Pass	Pass
Bromomethane	70	130	20	112	96	15	Pass	Pass	Pass
Chloroethane	70	130	20	184	165	11	> UCL	> UCL	Pass
Trichlorofluoromethane	56	149	20	148	141	5	Pass	Pass	Pass
Freon 113	70	130	20	113	110	3	Pass	Pass	Pass
1,1-Dichloroethene	52	144	20	116	113	3	Pass	Pass	Pass
Acetone	70	130	20	83	85	2	Pass	Pass	Pass
Carbon Disulfide	70	130	20	107	103	3	Pass	Pass	Pass
Methylene Chloride	47	148	20	98	99	1	Pass	Pass	Pass
trans-1,2-Dichloroethene	41	157	20	104	101	3	Pass	Pass	Pass
Mtbe	60	145	20	79	86	9	Pass	Pass	Pass
1,1-Dichloroethane	69	134	20	105	103	2	Pass	Pass	Pass
cis-1,2-Dichloroethene	59	143	20	109	108	1	Pass	Pass	Pass
2-Butanone	70	130	20	74	78	5	Pass	Pass	Pass
Chloroform	64	148	20	106	107	1	Pass	Pass	Pass
1,1,1-Trichloroethane	53	147	20	115	114	1	Pass	Pass	Pass
Carbon Tetrachloride	51	161	20	115	112	2	Pass	Pass	Pass
Benzene	51	149	20	109	108	1	Pass	Pass	Pass
1,2-Dichloroethane	51	163	20	89	90	2	Pass	Pass	Pass
Trichloroethene	50	147	20	92	91	2	Pass	Pass	Pass
1,2-Dichloropropane	62	150	20	96	97	0	Pass	Pass	Pass
Bromodichloromethane	58	156	20	95	97	2	Pass	Pass	Pass
c-1,3-Dichloropropene	53	169	20	102	103	1	Pass	Pass	Pass
4-Methyl-2-Pentanone	70	130	20	72	74	3	Pass	Pass	Pass
Toluene	60	136	20	114	110	4	Pass	Pass	Pass
t-1,3-Dichloropropene	72	154	20	104	105	1	Pass	Pass	Pass
1,1,2-Trichloroethane	64	144	20	103	104	2	Pass	Pass	Pass
Tetrachloroethene	56	138	20	114	109	5	Pass	Pass	Pass
2-Hexanone	70	130	20	75	77	3	Pass	Pass	Pass
Dibromochloromethane	69	147	20	103	104	1	Pass	Pass	Pass
1,2-Dibromoethane	70	130	20	95	96	2	Pass	Pass	Pass
Chlorobenzene	83	128	20	105	103	1	Pass	Pass	Pass
Ethylbenzene	60	143	20	124	119	4	Pass	Pass	Pass
m,p-Xylene	58	142	20	122	117	4	Pass	Pass	Pass
o-Xylene	57	145	20	121	118	3	Pass	Pass	Pass
Styrene	64	146	20	110	106	3	Pass	Pass	Pass
Bromoform	59	157	20	105	103	1	Pass	Pass	Pass
Isopropylbenzene	103	148	20	120	114	5	Pass	Pass	Pass
1,1,2,2-Tetrachloroethane	70	130	20	91	92	1	Pass	Pass	Pass
1,3-Dichlorobenzene	74	117	20	110	107	3	Pass	Pass	Pass
1,4-Dichlorobenzene	76	116	20	106	103	3	Pass	Pass	Pass
1,2-Dichlorobenzene	72	124	20	103	101	1	Pass	Pass	Pass
1,2-Dibromo-3-chloropropan	44	182	20	69	73	6	Pass	Pass	Pass
1,2,4-Trichlorobenzene	57	102	20	103	102	0	> UCL	> UCL	Pass

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit.

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Glenn Jackson
Site: NCBC Gulfport	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-249
On-site Dates: 10/10/06-10/17/06	Client Project Manager: Jason Bourgeois	Matrix: Water

Samples: 03GP1001 MS 03GP1001 MSD		Date of Analysis: 10/14/2006							
Matrix Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	RPD	MS	MSD	RPD	MS	MSD	RPD
Dichlorodifluoromethane	90	120	20	134	109	20	> UCL	Pass	Pass
Chloromethane	39	142	20	103	95	7	Pass	Pass	Pass
Vinyl Chloride	20	187	20	92	87	5	Pass	Pass	Pass
Bromomethane	70	130	20	109	88	22	Pass	Pass	Pass
Chloroethane	70	130	20	172	177	3	> UCL	> UCL	Pass
Trichlorofluoromethane	56	149	20	139	136	2	Pass	Pass	Pass
Freon 113	70	130	20	122	107	13	Pass	Pass	Pass
1,1-Dichloroethene	52	144	20	109	107	3	Pass	Pass	Pass
Acetone	70	130	20	86	83	4	Pass	Pass	Pass
Carbon Disulfide	70	130	20	103	98	4	Pass	Pass	Pass
Methylene Chloride	47	148	20	91	92	0	Pass	Pass	Pass
trans-1,2-Dichloroethene	41	157	20	99	99	0	Pass	Pass	Pass
Mtbe	60	145	20	76	75	2	Pass	Pass	Pass
1,1-Dichloroethane	69	134	20	102	101	1	Pass	Pass	Pass
cis-1,2-Dichloroethene	59	143	20	106	105	0	Pass	Pass	Pass
2-Butanone	70	130	20	77	78	2	Pass	Pass	Pass
Chloroform	64	148	20	106	102	4	Pass	Pass	Pass
1,1,1-Trichloroethane	53	147	20	112	110	2	Pass	Pass	Pass
Carbon Tetrachloride	51	161	20	109	113	3	Pass	Pass	Pass
Benzene	51	149	20	106	103	2	Pass	Pass	Pass
1,2-Dichloroethane	51	163	20	86	86	0	Pass	Pass	Pass
Trichloroethene	50	147	20	93	89	4	Pass	Pass	Pass
1,2-Dichloropropane	62	150	20	95	92	3	Pass	Pass	Pass
Bromodichloromethane	58	156	20	94	93	1	Pass	Pass	Pass
c-1,3-Dichloropropene	53	169	20	99	98	1	Pass	Pass	Pass
4-Methyl-2-Pentanone	70	130	20	72	75	5	Pass	Pass	Pass
Toluene	60	136	20	106	105	1	Pass	Pass	Pass
t-1,3-Dichloropropene	72	154	20	97	96	1	Pass	Pass	Pass
1,1,2-Trichloroethane	64	144	20	98	97	1	Pass	Pass	Pass
Tetrachloroethene	56	138	20	103	102	1	Pass	Pass	Pass
2-Hexanone	70	130	20	75	75	1	Pass	Pass	Pass
Dibromochloromethane	69	147	20	97	97	0	Pass	Pass	Pass
1,2-Dibromoethane	70	130	20	90	88	2	Pass	Pass	Pass
Chlorobenzene	83	128	20	100	98	2	Pass	Pass	Pass
Ethylbenzene	60	143	20	113	115	1	Pass	Pass	Pass
m,p-Xylene	58	142	20	111	114	3	Pass	Pass	Pass
o-Xylene	57	145	20	111	113	2	Pass	Pass	Pass
Styrene	64	146	20	101	100	1	Pass	Pass	Pass
Bromoform	59	157	20	93	96	3	Pass	Pass	Pass
Isopropylbenzene	103	148	20	110	110	0	Pass	Pass	Pass
1,1,2,2-Tetrachloroethane	70	130	20	84	84	1	Pass	Pass	Pass
1,3-Dichlorobenzene	74	117	20	101	102	1	Pass	Pass	Pass
1,4-Dichlorobenzene	76	116	20	97	98	1	Pass	Pass	Pass
1,2-Dichlorobenzene	72	124	20	94	96	2	Pass	Pass	Pass
1,2-Dibromo-3-chloropropan	44	182	20	67	61	10	Pass	Pass	Pass
1,2,4-Trichlorobenzene	57	102	20	91	94	3	Pass	Pass	Pass

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit.

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Glenn Jackson
Site: NCBC Gulfport	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-249
On-site Dates: 10/10/06-10/17/06	Client Project Manager: Jason Bourgeois	Matrix: Water

Samples: 03GP1204 MS 03GP1204 MSD		Date of Analysis: 10/15/2006							
Matrix Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	RPD	MS	MSD	RPD	MS	MSD	RPD
Dichlorodifluoromethane	90	120	20	140	136	3	> UCL	> UCL	Pass
Chloromethane	39	142	20	104	99	4	Pass	Pass	Pass
Vinyl Chloride	20	187	20	95	91	4	Pass	Pass	Pass
Bromomethane	70	130	20	109	85	25	Pass	Pass	Pass
Chloroethane	70	130	20	195	177	9	> UCL	> UCL	Pass
Trichlorofluoromethane	56	149	20	146	139	5	Pass	Pass	Pass
Freon 113	70	130	20	114	107	6	Pass	Pass	Pass
1,1-Dichloroethene	52	144	20	111	106	4	Pass	Pass	Pass
Acetone	70	130	20	80	79	1	Pass	Pass	Pass
Carbon Disulfide	70	130	20	102	92	11	Pass	Pass	Pass
Methylene Chloride	47	148	20	95	94	1	Pass	Pass	Pass
trans-1,2-Dichloroethene	41	157	20	100	98	2	Pass	Pass	Pass
Mtbe	60	145	20	79	80	1	Pass	Pass	Pass
1,1-Dichloroethane	69	134	20	107	104	3	Pass	Pass	Pass
cis-1,2-Dichloroethene	59	143	20	111	108	2	Pass	Pass	Pass
2-Butanone	70	130	20	76	73	3	Pass	Pass	Pass
Chloroform	64	148	20	110	108	2	Pass	Pass	Pass
1,1,1-Trichloroethane	53	147	20	120	115	4	Pass	Pass	Pass
Carbon Tetrachloride	51	161	20	115	114	1	Pass	Pass	Pass
Benzene	51	149	20	108	106	2	Pass	Pass	Pass
1,2-Dichloroethane	51	163	20	88	89	1	Pass	Pass	Pass
Trichloroethene	50	147	20	92	93	1	Pass	Pass	Pass
1,2-Dichloropropane	62	150	20	99	98	1	Pass	Pass	Pass
Bromodichloromethane	58	156	20	98	100	1	Pass	Pass	Pass
c-1,3-Dichloropropene	53	169	20	103	105	3	Pass	Pass	Pass
4-Methyl-2-Pentanone	70	130	20	67	70	3	< LCL	< LCL	Pass
Toluene	60	136	20	110	107	3	Pass	Pass	Pass
t-1,3-Dichloropropene	72	154	20	100	101	1	Pass	Pass	Pass
1,1,2-Trichloroethane	64	144	20	100	104	4	Pass	Pass	Pass
Tetrachloroethene	56	138	20	105	105	0	Pass	Pass	Pass
2-Hexanone	70	130	20	70	70	0	Pass	Pass	Pass
Dibromochloromethane	69	147	20	102	103	2	Pass	Pass	Pass
1,2-Dibromoethane	70	130	20	90	94	5	Pass	Pass	Pass
Chlorobenzene	83	128	20	104	102	2	Pass	Pass	Pass
Ethylbenzene	60	143	20	119	114	5	Pass	Pass	Pass
m,p-Xylene	58	142	20	122	116	5	Pass	Pass	Pass
o-Xylene	57	145	20	119	115	4	Pass	Pass	Pass
Styrene	64	146	20	108	103	5	Pass	Pass	Pass
Bromoform	59	157	20	98	99	1	Pass	Pass	Pass
Isopropylbenzene	103	148	20	117	112	5	Pass	Pass	Pass
1,1,2,2-Tetrachloroethane	70	130	20	84	95	13	Pass	Pass	Pass
1,3-Dichlorobenzene	74	117	20	105	104	1	Pass	Pass	Pass
1,4-Dichlorobenzene	76	116	20	102	101	1	Pass	Pass	Pass
1,2-Dichlorobenzene	72	124	20	99	99	0	Pass	Pass	Pass
1,2-Dibromo-3-chloropropan	44	182	20	64	69	7	Pass	Pass	Pass
1,2,4-Trichlorobenzene	57	102	20	94	100	7	Pass	Pass	Pass

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit.

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Glenn Jackson
Site: NCBC Gulfport	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-249
On-site Dates: 10/10/06-10/17/06	Client Project Manager: Jason Bourgeois	Matrix: Water

Samples: 03GP1601 MS 03GP1601 MSD		Date of Analysis: 10/15/2006							
Matrix Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	RPD	MS	MSD	RPD	MS	MSD	RPD
Dichlorodifluoromethane	90	120	20	116	136	15	Pass	> UCL	Pass
Chloromethane	39	142	20	93	90	3	Pass	Pass	Pass
Vinyl Chloride	20	187	20	106	115	8	Pass	Pass	Pass
Bromomethane	70	130	20	68	85	22	< LCL	Pass	Pass
Chloroethane	70	130	20	145	184	24	> UCL	> UCL	Pass
Trichlorofluoromethane	56	149	20	134	134	0	Pass	Pass	Pass
Freon 113	70	130	20	118	102	15	Pass	Pass	Pass
1,1-Dichloroethene	52	144	20	109	101	7	Pass	Pass	Pass
Acetone	70	130	20	111	103	8	Pass	Pass	Pass
Carbon Disulfide	70	130	20	93	94	1	Pass	Pass	Pass
Methylene Chloride	47	148	20	98	105	7	Pass	Pass	Pass
trans-1,2-Dichloroethene	41	157	20	103	89	15	Pass	Pass	Pass
Mtbe	60	145	20	100	90	11	Pass	Pass	Pass
1,1-Dichloroethane	69	134	20	109	96	12	Pass	Pass	Pass
cis-1,2-Dichloroethene	59	143	20	160	137	15	> UCL	Pass	Pass
2-Butanone	70	130	20	101	88	14	Pass	Pass	Pass
Chloroform	64	148	20	114	104	9	Pass	Pass	Pass
1,1,1-Trichloroethane	53	147	20	118	111	6	Pass	Pass	Pass
Carbon Tetrachloride	51	161	20	120	112	7	Pass	Pass	Pass
Benzene	51	149	20	118	117	1	Pass	Pass	Pass
1,2-Dichloroethane	51	163	20	101	91	10	Pass	Pass	Pass
Trichloroethene	50	147	20	95	97	2	Pass	Pass	Pass
1,2-Dichloropropane	62	150	20	108	103	5	Pass	Pass	Pass
Bromodichloromethane	58	156	20	113	104	8	Pass	Pass	Pass
c-1,3-Dichloropropene	53	169	20	119	114	4	Pass	Pass	Pass
4-Methyl-2-Pentanone	70	130	20	92	80	14	Pass	Pass	Pass
Toluene	60	136	20	109	104	5	Pass	Pass	Pass
t-1,3-Dichloropropene	72	154	20	118	105	11	Pass	Pass	Pass
1,1,2-Trichloroethane	64	144	20	120	108	10	Pass	Pass	Pass
Tetrachloroethene	56	138	20	105	98	7	Pass	Pass	Pass
2-Hexanone	70	130	20	96	86	11	Pass	Pass	Pass
Dibromochloromethane	69	147	20	117	106	10	Pass	Pass	Pass
1,2-Dibromoethane	70	130	20	111	101	10	Pass	Pass	Pass
Chlorobenzene	83	128	20	106	103	4	Pass	Pass	Pass
Ethylbenzene	60	143	20	110	102	8	Pass	Pass	Pass
m,p-Xylene	58	142	20	111	104	7	Pass	Pass	Pass
o-Xylene	57	145	20	111	103	7	Pass	Pass	Pass
Styrene	64	146	20	106	97	10	Pass	Pass	Pass
Bromoform	59	157	20	116	100	14	Pass	Pass	Pass
Isopropylbenzene	103	148	20	107	101	6	Pass	< LCL	Pass
1,1,2,2-Tetrachloroethane	70	130	20	106	96	10	Pass	Pass	Pass
1,3-Dichlorobenzene	74	117	20	106	103	3	Pass	Pass	Pass
1,4-Dichlorobenzene	76	116	20	104	101	3	Pass	Pass	Pass
1,2-Dichlorobenzene	72	124	20	104	102	2	Pass	Pass	Pass
1,2-Dibromo-3-chloropropan	44	182	20	87	81	8	Pass	Pass	Pass
1,2,4-Trichlorobenzene	57	102	20	105	110	4	> UCL	> UCL	Pass

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit.

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Glenn Jackson
Site: NCBC Gulfport	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-249
On-site Dates: 10/10/06-10/17/06	Client Project Manager: Jason Bourgeois	Matrix: Water

Laboratory Control Spikes (LCS):

Spike Compounds	Control Limits		Percent Recoveries			Control Limit Checks		
	Lower	Upper	LCS#1	LCS#2	LCS#3	LCS#1	LCS#2	LCS#3
Dichlorodifluoromethane	70	to 130	107	173	209	Pass	> UCL	> UCL
Chloromethane	70	to 130	101	114	116	Pass	Pass	Pass
Vinyl Chloride	55	to 148	97	103	108	Pass	Pass	Pass
Bromomethane	70	to 130	99	102	130	Pass	Pass	Pass
Chloroethane	70	to 130	119	198	192	Pass	> UCL	> UCL
Trichlorofluoromethane	70	to 130	125	137	150	Pass	> UCL	> UCL
Freon 113	70	to 130	100	113	103	Pass	Pass	Pass
1,1-Dichloroethene	56	to 145	109	116	117	Pass	Pass	Pass
Acetone	70	to 130	106	84	86	Pass	Pass	Pass
Carbon Disulfide	70	to 130	104	124	98	Pass	Pass	Pass
Methylene Chloride	70	to 130	95	94	96	Pass	Pass	Pass
t-1,2-Dichloroethene	54	to 138	101	104	104	Pass	Pass	Pass
Mtbe	70	to 130	106	76	76	Pass	Pass	Pass
1,1-Dichloroethane	70	to 130	99	100	100	Pass	Pass	Pass
c-1,2-Dichloroethene	70	to 122	106	106	97	Pass	Pass	Pass
2-Butanone	70	to 130	103	80	79	Pass	Pass	Pass
Chloroform	70	to 130	108	102	102	Pass	Pass	Pass
1,1,1-Trichloroethane	70	to 130	108	111	98	Pass	Pass	Pass
Carbon Tetrachloride	70	to 130	109	110	103	Pass	Pass	Pass
Benzene	72	to 121	108	104	104	Pass	Pass	Pass
1,2-Dichloroethane	70	to 130	101	86	86	Pass	Pass	Pass
Trichloroethene	67	to 118	101	88	96	Pass	Pass	Pass
1,2-Dichloropropane	70	to 130	99	88	85	Pass	Pass	Pass
Bromodichloromethane	70	to 130	106	92	85	Pass	Pass	Pass
c-1,3-Dichloropropene	70	to 130	100	100	65	Pass	Pass	< LCL
4-Methyl-2-Pentanone	70	to 130	97	74	72	Pass	Pass	Pass
Toluene	75	to 129	107	106	104	Pass	Pass	Pass
t-1,3-Dichloropropene	70	to 130	102	99	52	Pass	Pass	< LCL
1,1,2-Trichloroethane	70	to 130	115	93	89	Pass	Pass	Pass
Tetrachloroethene	75	to 131	102	111	102	Pass	Pass	Pass
2-Hexanone	70	to 130	99	76	77	Pass	Pass	Pass
Dibromochloromethane	70	to 130	111	96	92	Pass	Pass	Pass
1,2-Dibromoethane	64	to 115	105	85	69	Pass	Pass	Pass
Chlorobenzene	70	to 126	100	100	96	Pass	Pass	Pass
Ethylbenzene	66	to 136	109	122	108	Pass	Pass	Pass
m,p-Xylene	66	to 145	113	122	108	Pass	Pass	Pass
o-Xylene	71	to 141	108	117	108	Pass	Pass	Pass
Styrene	70	to 134	101	107	97	Pass	Pass	Pass
Bromoform	53	to 147	114	94	89	Pass	Pass	Pass
Isopropylbenzene	96	to 126	101	118	114	Pass	Pass	Pass
1,1,2,2-Tetrachloroethane	70	to 130	64	84	37	< LCL	Pass	< LCL
1,3-Dichlorobenzene	70	to 130	102	105	98	Pass	Pass	Pass
1,4-Dichlorobenzene	70	to 130	100	98	92	Pass	Pass	Pass
1,2-Dichlorobenzene	70	to 130	102	96	92	Pass	Pass	Pass
1,2-Dibromo-3-chloropropan	70	to 130	32	63	8	< LCL	< LCL	< LCL
1,2,4-Trichlorobenzene	85	to 134	103	95	89	Pass	Pass	Pass

Note: Control limits are based on method guidance.

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Glenn Jackson
Site: NCBC Gulfport	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-249
On-site Dates: 10/10/06-10/17/06	Client Project Manager: Jason Bourgeois	Matrix: Water

Samples:	LCS 4	Date of Analysis:	10/13/2006
	LCS 5		10/14/2006
	LCS 6		10/15/2006

Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower		Upper	LCS#4	LCS#5	LCS#6	LCS#4	LCS#5	LCS#6
Dichlorodifluoromethane	70	to	130	143	245	244	> UCL	> UCL	> UCL
Chloromethane	70	to	130	107	122	126	Pass	Pass	Pass
Vinyl Chloride	55	to	148	95	113	120	Pass	Pass	Pass
Bromomethane	70	to	130	130	130	128	Pass	Pass	Pass
Chloroethane	70	to	130	175	222	235	> UCL	> UCL	> UCL
Trichlorofluoromethane	70	to	130	138	167	175	> UCL	> UCL	> UCL
Freon 113	70	to	130	110	113	118	Pass	Pass	Pass
1,1-Dichloroethene	56	to	145	119	117	122	Pass	Pass	Pass
Acetone	70	to	130	87	86	NA	Pass	Pass	NA
Carbon Disulfide	70	to	130	103	103	NA	Pass	Pass	NA
Methylene Chloride	70	to	130	93	99	101	Pass	Pass	Pass
t-1,2-Dichloroethene	54	to	138	102	108	114	Pass	Pass	Pass
Mtbe	70	to	130	75	80	84	Pass	Pass	Pass
1,1-Dichloroethane	70	to	130	102	103	110	Pass	Pass	Pass
c-1,2-Dichloroethene	70	to	122	95	111	115	Pass	Pass	Pass
2-Butanone	70	to	130	74	79	NA	Pass	Pass	NA
Chloroform	70	to	130	105	106	111	Pass	Pass	Pass
1,1,1-Trichloroethane	70	to	130	101	113	119	Pass	Pass	Pass
Carbon Tetrachloride	70	to	130	111	113	119	Pass	Pass	Pass
Benzene	72	to	121	104	109	115	Pass	Pass	Pass
1,2-Dichloroethane	70	to	130	87	86	90	Pass	Pass	Pass
Trichloroethene	67	to	118	94	90	95	Pass	Pass	Pass
1,2-Dichloropropane	70	to	130	89	91	99	Pass	Pass	Pass
Bromodichloromethane	70	to	130	91	91	95	Pass	Pass	Pass
c-1,3-Dichloropropene	70	to	130	79	101	107	Pass	Pass	Pass
4-Methyl-2-Pentanone	70	to	130	66	73	NA	< LCL	Pass	NA
Toluene	75	to	129	106	110	113	Pass	Pass	Pass
t-1,3-Dichloropropene	70	to	130	63	106	110	< LCL	Pass	Pass
1,1,2-Trichloroethane	70	to	130	98	96	98	Pass	Pass	Pass
Tetrachloroethene	75	to	131	107	109	111	Pass	Pass	Pass
2-Hexanone	70	to	130	64	77	NA	< LCL	Pass	NA
Dibromochloromethane	70	to	130	98	97	99	Pass	Pass	Pass
1,2-Dibromoethane	64	to	115	80	90	92	Pass	Pass	Pass
Chlorobenzene	70	to	126	99	101	106	Pass	Pass	Pass
Ethylbenzene	66	to	136	116	119	121	Pass	Pass	Pass
m,p-Xylene	66	to	145	116	118	121	Pass	Pass	Pass
o-Xylene	71	to	141	111	118	121	Pass	Pass	Pass
Styrene	70	to	134	105	104	107	Pass	Pass	Pass
Bromoform	53	to	147	96	95	95	Pass	Pass	Pass
Isopropylbenzene	96	to	126	113	125	129	Pass	Pass	> UCL
1,1,2,2-Tetrachloroethane	70	to	130	64	84	85	< LCL	Pass	Pass
1,3-Dichlorobenzene	70	to	130	104	105	108	Pass	Pass	Pass
1,4-Dichlorobenzene	70	to	130	97	101	104	Pass	Pass	Pass
1,2-Dichlorobenzene	70	to	130	98	97	103	Pass	Pass	Pass
1,2-Dibromo-3-chloropropan	70	to	130	27	61	64	< LCL	< LCL	< LCL
1,2,4-Trichlorobenzene	85	to	134	98	95	103	Pass	Pass	Pass

Note: Control limits are based on method guidance.

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Glenn Jackson
Site: NCBC Gulfport	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-249
On-site Dates: 10/10/06-10/17/06	Client Project Manager: Jason Bourgeois	Matrix: Water

Spike Compounds	Control Limits			Percent Recoveries		Control Limit Checks		
	Lower		Upper	LCS#7	LCS#8	LCS#7	LCS#8	
Dichlorodifluoromethane	70	to	130	98	94	Pass	Pass	
Chloromethane	70	to	130	85	62	Pass	< LCL	
Vinyl Chloride	55	to	148	84	82	Pass	Pass	
Bromomethane	70	to	130	54	65	< LCL	< LCL	
Chloroethane	70	to	130	115	107	Pass	Pass	
Trichlorofluoromethane	70	to	130	123	117	Pass	Pass	
Freon 113	70	to	130	101	124	Pass	Pass	
1,1-Dichloroethene	56	to	145	101	97	Pass	Pass	
Acetone	70	to	130	114	137	Pass	> UCL	
Carbon Disulfide	70	to	130	81	79	Pass	Pass	
Methylene Chloride	70	to	130	97	101	Pass	Pass	
t-1,2-Dichloroethene	54	to	138	96	99	Pass	Pass	
Mtbe	70	to	130	110	129	Pass	Pass	
1,1-Dichloroethane	70	to	130	105	109	Pass	Pass	
c-1,2-Dichloroethene	70	to	122	112	117	Pass	Pass	
2-Butanone	70	to	130	117	139	Pass	> UCL	
Chloroform	70	to	130	117	122	Pass	Pass	
1,1,1-Trichloroethane	70	to	130	114	119	Pass	Pass	
Carbon Tetrachloride	70	to	130	116	121	Pass	Pass	
Benzene	72	to	121	112	116	Pass	Pass	
1,2-Dichloroethane	70	to	130	103	112	Pass	Pass	
Trichloroethene	67	to	118	93	100	Pass	Pass	
1,2-Dichloropropane	70	to	130	109	115	Pass	Pass	
Bromodichloromethane	70	to	130	114	122	Pass	Pass	
c-1,3-Dichloropropene	70	to	130	122	130	Pass	> UCL	
4-Methyl-2-Pentanone	70	to	130	101	114	Pass	Pass	
Toluene	75	to	129	105	103	Pass	Pass	
t-1,3-Dichloropropene	70	to	130	118	120	Pass	Pass	
1,1,2-Trichloroethane	70	to	130	123	127	Pass	Pass	
Tetrachloroethene	75	to	131	101	100	Pass	Pass	
2-Hexanone	70	to	130	106	123	Pass	Pass	
Dibromochloromethane	70	to	130	118	124	Pass	Pass	
1,2-Dibromoethane	64	to	115	115	118	Pass	> UCL	
Chlorobenzene	70	to	126	103	104	Pass	Pass	
Ethylbenzene	66	to	136	103	103	Pass	Pass	
m,p-Xylene	66	to	145	104	103	Pass	Pass	
o-Xylene	71	to	141	104	104	Pass	Pass	
Styrene	70	to	134	101	99	Pass	Pass	
Bromoform	53	to	147	121	127	Pass	Pass	
Isopropylbenzene	96	to	126	101	99	Pass	Pass	
1,1,2,2-Tetrachloroethane	70	to	130	112	117	Pass	Pass	
1,3-Dichlorobenzene	70	to	130	102	102	Pass	Pass	
1,4-Dichlorobenzene	70	to	130	101	100	Pass	Pass	
1,2-Dichlorobenzene	70	to	130	102	103	Pass	Pass	
1,2-Dibromo-3-chloropropan	70	to	130	94	105	Pass	Pass	
1,2,4-Trichlorobenzene	85	to	134	109	110	Pass	Pass	

Note: Control limits are based on method guidance.

KB LABS, INC.

Final Data Report: NCBC Gulfport

October 10 - 17, 2006

Prepared for: Tetra Tech NUS

	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID
	03GP0101	03GP0102	03GP0103	03GP0201	03GP0202	03GP0203	03GP0301	03GP0302	03GP0303	03GP0402	03GP0403
Date of Analysis:	10/11/06	10/11/06	10/11/06	10/11/06	10/11/06	10/11/06	10/11/06	10/11/06	10/11/06	10/12/06	10/12/06
Matrix:	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Dilution Factor:	1	1	1	1,10	1,10	10	10	10	10	1	1
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Chloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Vinyl chloride	< 1.0	< 1.0	< 1.0	62.2	27.8	<10	150	<10	< 1.0	< 1.0	< 1.0
Bromomethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Chloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Freon 113	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Acetone	< 100	< 100	< 100	< 100	< 100	<1000	<1000	<1000	< 100	< 100	< 100
Carbon Disulfide	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Methylene Chloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
t-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	32.8	87.4	<10	<10	<10	< 1.0	< 1.0	< 1.0
MtBE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	<50	<50	<50	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
c-1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	220	320	31	160	120	< 1.0	< 1.0	< 1.0
2-Butanone	< 100	< 100	< 100	< 100	< 100	<1000	<1000	<1000	< 100	< 100	< 100
Chloroform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Benzene	< 1.0	< 1.0	< 1.0	4.2	1.6	<10	12	<10	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	1.6	1.6	<10	<10	<10	< 1.0	< 1.0	< 1.0
Trichloroethene	< 1.0	< 1.0	< 1.0	1.8	15.0	<10	15	<10	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Bromodichloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
c-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
4-Methyl-2-Pentanone	< 100	< 100	< 100	< 100	< 100	<1000	<1000	<1000	< 100	< 100	< 100
Toluene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
t,1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Tetrachloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
2-Hexanone	< 100	< 100	< 100	< 100	< 100	<1000	<1000	<1000	< 100	< 100	< 100
Dibromochloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Ethylbenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
m,p-Xylene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
o-Xylene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Styrene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
Isopropylbenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	< 1.0	< 1.0	< 1.0	1.2	< 1.0	<10	<10	<10	< 1.0	< 1.0	< 1.0

Units for waters are ug/L and for soils are mg/Kg.

KB LABS, INC.

Final Data Report: NCBC Gulfport

October 10 - 17, 2006

Prepared for: Tetra Tech NUS

	Sample ID										
	03GP0501	03GP0502	03GP0503	03GP0601	03GP0602	03GP0603	03GP0701	03GP0702	03GP0703	03GP0801	03GP0802
Date of Analysis:	10/12/06	10/12/06	10/12/06	10/13/06	10/13/06	10/13/06	10/13/06	10/13/06	10/13/06	10/13/06	10/13/06
Matrix:	Water										
Dilution Factor:	1	1	1	1	1	1	1	1	1	1	1
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Freon 113	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acetone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Carbon Disulfide	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
t-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MtBE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
c-1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Chloroform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
c-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Methyl-2-Pentanone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Toluene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
t,1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Hexanone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Dibromochloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Units for waters are ug/L and for soils are mg/Kg.

KB LABS, INC.

Final Data Report: NCBC Gulfport

October 10 - 17, 2006

Prepared for: Tetra Tech NUS

	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID					
	03GP0803	03GP0804	03GP0901	03GP0902	03GP0903	03GP1001	03GP1002	03GP1003	03GP1004	03GP1101	03GP1102
Date of Analysis:	10/13/06	10/13/06	10/13/06	10/13/06	10/13/06	10/14/06	10/14/06	10/14/06	10/14/06	10/14/06	10/14/06
Matrix:	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Dilution Factor:	1	1	1	1	1	1	1	1	1	1	1
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.0	12.7
Bromomethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Freon 113	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acetone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Carbon Disulfide	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
t-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.9
MtBE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
c-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.3	< 1.0	3.6	9.5	4.0	39.4
2-Butanone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Chloroform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.8	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
c-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Methyl-2-Pentanone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Toluene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
t,1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Hexanone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Dibromochloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0

Units for waters are ug/L. and for soils are mg/Kg.

KB LABS, INC.

Final Data Report: NCBC Gulfport

October 10 - 17, 2006

Prepared for: Tetra Tech NUS

	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID
	03GP1103	03GP1104	03GP1201	03GP1202	03GP1203	03GP1204	03GP1301	03GP1302	03GP1303	03GP1401	03GP1402
Date of Analysis:	10/14/06	10/14/06	10/15/06	10/14/06	10/14/06	10/14/06	10/15/06	10/15/06	10/15/06	10/15/06	10/15/06
Matrix:	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Dilution Factor:	1	1	1	1	1	1	1	1	1	1	1
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	8.8	< 1.0	4.0	23.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Freon 113	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acetone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Carbon Disulfide	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
t-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MtBE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
c-1,2-Dichloroethene	34.2	< 1.0	9.5	20.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Chloroform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	2.9	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
c-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Methyl-2-Pentanone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Toluene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
t,1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Hexanone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
Dibromochloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	1.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Units for waters are ug/L. and for soils are mg/Kg.

KB LABS, INC.

Final Data Report: NCBC Gulfport

October 10 - 17, 2006

Prepared for: Tetra Tech NUS

	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID					
	03GP1403	03GP1404	03GP1501	03GP1502	03GP1503	03GP1601	03GP1602	03GP1603	03GP1604	03GP1701	03GP1702
Date of Analysis:	10/15/06	10/15/06	10/15/06	10/15/06	10/15/06	10/15/06	10/15/06	10/15/06	10/15/06	10/16/06	10/16/06
Matrix:	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Dilution Factor:	1	1	1	1	1	1	5	1	1	1	1
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	6.5	77	< 1.0	< 1.0	1.2	6.6
Bromomethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Freon 113	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Acetone	< 100	< 100	< 100	< 100	< 100	< 100	< 500	< 100	< 100	< 100	< 100
Carbon Disulfide	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
t-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	2.2
MtBE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 25	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
c-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	12.5	310	3.9	< 1.0	5.9	25.4
2-Butanone	< 100	< 100	< 100	< 100	< 100	< 100	< 500	< 100	< 100	< 100	< 100
Chloroform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	1.9
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
c-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Methyl-2-Pentanone	< 100	< 100	< 100	< 100	< 100	< 100	< 500	< 100	< 100	< 100	< 100
Toluene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
t,1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Hexanone	< 100	< 100	< 100	< 100	< 100	< 100	< 500	< 100	< 100	< 100	< 100
Dibromochloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0

Units for waters are ug/L. and for soils are mg/Kg.

KB LABS, INC.

Final Data Report: NCBC Gulfport

October 10 - 17, 2006

Prepared for: Tetra Tech NUS

	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID
	03GP1703	03GP1704	03GP1801	03GP1802	03GP1803	03GP1804	03GP1904	03GP1903	03GP1901	03GP1902	03GP2001
Date of Analysis:	10/16/06	10/16/06	10/16/06	10/16/06	10/16/06	10/16/06	10/16/06	10/16/06	10/16/06	10/16/06	10/16/06
Matrix:	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Dilution Factor:	1	1	1	1	1.5	1	1	2	1	2	1
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Chloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Vinyl chloride	2.0	< 1.0	1.7	12.1	54.5	< 1.0	< 1.0	38	2.8	28	< 1.0
Bromomethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Chloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Freon 113	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	2.2	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Acetone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 200	< 100	< 200	< 100
Carbon Disulfide	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Methylene Chloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
t-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	6.8	4.1	< 1.0	< 1.0	21	1.5	13	< 1.0
MtBE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 10	< 5.0	< 10	< 5.0
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
c-1,2-Dichloroethene	18.9	< 1.0	7.0	50.2	160	< 1.0	< 1.0	155	19.7	110	< 1.0
2-Butanone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 200	< 100	< 200	< 100
Chloroform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Benzene	< 1.0	< 1.0	< 1.0	1.5	1.2	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Trichloroethene	< 1.0	< 1.0	< 1.0	1.7	25.9	< 1.0	< 1.0	4.6	2.2	3.3	< 1.0
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Bromodichloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
c-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
4-Methyl-2-Pentanone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 200	< 100	< 200	< 100
Toluene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
t,1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Tetrachloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
2-Hexanone	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 200	< 100	< 200	< 100
Dibromochloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
1,2-Dibromoethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Chlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	1.1	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Ethylbenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
m,p-Xylene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
o-Xylene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Styrene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
Isopropylbenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
1,3-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
1,4-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
1,2-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
1,2-Dibromo-3-chloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0
1,2,4-Trichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 2.0	< 1.0

Units for waters are ug/L. and for soils are mg/Kg.

KB LABS, INC.

Final Data Report: NCBC Gulfport

October 10 - 17, 2006

Prepared for: Tetra Tech NUS

	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID
	03GP2002	03GP2003	03GP2004	03GP2101	03GP2102	03GP2103	03GP2104	03GP2201	03GP2202	03GP2203	03GP2204
Date of Analysis:	10/16/06	10/16/06	10/16/06	10/16/06	10/16/06	10/16/06	10/17/06	10/17/06	10/17/06	10/17/06	10/17/06
Matrix:	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Dilution Factor:	1	1	1	5	5	2	1	1	1	1, 2	1, 5
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	< 1.0	< 1.0	< 1.0	10	22	20	< 1.0	< 1.0	< 1.0	1.3	1.7
Bromomethane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Freon 113	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acetone	< 100	< 100	< 100	<500	<500	<200	< 100	< 100	< 100	< 100	< 100
Carbon Disulfide	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
t-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	<5.0	14	5.7	< 1.0	< 1.0	3.2	10.1	10.0
MtBE	< 5.0	< 5.0	< 5.0	<25	<25	<10	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
c-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	81	290	180	16.7	17.1	83.8	120	430
2-Butanone	< 100	< 100	< 100	<500	<500	<200	< 100	< 100	< 100	< 100	< 100
Chloroform	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	< 1.0	< 1.0	< 1.0	6.6	15	7.2	< 1.0	< 1.0	3.4	5.8	15.8
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
c-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Methyl-2-Pentanone	< 100	< 100	< 100	<500	<500	<200	< 100	< 100	< 100	< 100	< 100
Toluene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
t,1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Hexanone	< 100	< 100	< 100	<500	<500	<200	< 100	< 100	< 100	< 100	< 100
Dibromochloromethane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m,p-Xylene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	< 1.0	< 1.0	< 1.0	<5.0	<5.0	<2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Units for waters are ug/L. and for soils are mg/Kg.

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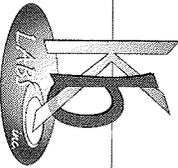
Final Data Report: NCBC Gulfport

October 10 - 17, 2006

Prepared for: Tetra Tech NUS

	Sample ID										
	03GP2304	03GP2303	03GP2302	03GP2301							
Date of Analysis:	10/17/06	10/17/06	10/17/06	10/17/06							
Matrix:	Water	Water	Water	Water							
Dilution Factor:	1	1	1	1							
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0	< 1.0							
Chloromethane	< 1.0	< 1.0	< 1.0	< 1.0							
Vinyl chloride	< 1.0	< 1.0	< 1.0	< 1.0							
Bromomethane	< 1.0	< 1.0	< 1.0	< 1.0							
Chloroethane	< 1.0	< 1.0	< 1.0	< 1.0							
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0	< 1.0							
Freon 113	< 1.0	< 1.0	< 1.0	< 1.0							
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0							
Acetone	< 100	< 100	< 100	< 100							
Carbon Disulfide	< 1.0	< 1.0	< 1.0	< 1.0							
Methylene Chloride	< 1.0	< 1.0	< 1.0	< 1.0							
t-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0							
MtBE	< 5.0	< 5.0	< 5.0	< 5.0							
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0							
c-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0							
2-Butanone	< 100	< 100	< 100	< 100							
Chloroform	< 1.0	< 1.0	< 1.0	< 1.0							
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0							
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	< 1.0							
Benzene	< 1.0	< 1.0	< 1.0	< 1.0							
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0							
Trichloroethene	< 1.0	< 1.0	< 1.0	< 1.0							
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0	< 1.0							
Bromodichloromethane	< 1.0	< 1.0	< 1.0	< 1.0							
c-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0							
4-Methyl-2-Pentanone	< 100	< 100	< 100	< 100							
Toluene	< 1.0	< 1.0	< 1.0	< 1.0							
t,1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0							
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0							
Tetrachloroethene	< 1.0	< 1.0	< 1.0	< 1.0							
2-Hexanone	< 100	< 100	< 100	< 100							
Dibromochloromethane	< 1.0	< 1.0	< 1.0	< 1.0							
1,2-Dibromoethane	< 1.0	< 1.0	< 1.0	< 1.0							
Chlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0							
Ethylbenzene	< 1.0	< 1.0	< 1.0	< 1.0							
m,p-Xylene	< 1.0	< 1.0	< 1.0	< 1.0							
o-Xylene	< 1.0	< 1.0	< 1.0	< 1.0							
Styrene	< 1.0	< 1.0	< 1.0	< 1.0							
Bromoform	< 1.0	< 1.0	< 1.0	< 1.0							
Isopropylbenzene	< 1.0	< 1.0	< 1.0	< 1.0							
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0							
1,3-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0							
1,4-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0							
1,2-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0							
1,2-Dibromo-3-chloropropane	< 1.0	< 1.0	< 1.0	< 1.0							
1,2,4-Trichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0							

Units for waters are ug/L. and for soils are mg/Kg.



Mobile Laboratory Services

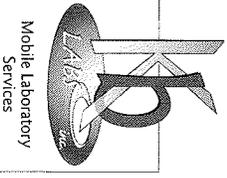
6821 SW Archer Road
 Gainesville, FL 32608
 TEL (352) 367-0073
 FAX (352) 367-0074

CHAIN-OF-CUSTODY RECORD

MOBILE UNIT #
 K81

CLIENT NAME TT	PROJECT NAME & ADDRESS KCBS Golfport		CONTACT PERSON Tasen Bourgeois		BATCH # (Lab Use Only)		SAMPLE MATRIX	NUMBER OF CONTAINERS	IDENTIFY PARAMETERS DESIRED AND NO OF CONTAINERS	PRESERVATION C Chilled H HCL O Other (see Remarks)
			DATE SAMPLED	TIME SAMPLED	DATE RECD	TIME RECD				
SAMPLES	SAMPLE FIELD ID \ NUMBER K31K10/006X	DATE SAMPLED 10/10/06	TIME SAMPLED	COMP GRAB	DATE RECD 10/10/06	TIME RECD 1230	GW 2	1	VOLATILES	COMMENT
	03GP 0102	↓			↓	1321				
	03GP 0103	↓			↓	1321				
	03GP 0201	10/11/06			10/11/06	1001				
	03GP 0202				↓					
	03GP 0203				↓	1120				
	03GP 0301				↓	1120				
	03GP 0302				↓	1520				
	03GP 0303				↓	1757				
	03GP 0402				↓	1757				
	03GP 0403				↓	1757				
	03GP 0501	10/12/06			↓	1330				
	03GP 0502				↓					
	03GP 0503				↓					
	03GP 0601				↓	1745				
Recleared Containers Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time	Remarks and Observations			
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time				

Matrix Types S Soil SW Surface Water GW Ground Water SG Soil Gas



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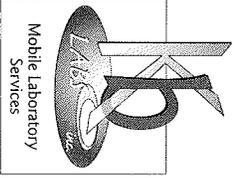
CHAIN-OF-CUSTODY RECORD

3

MOBILE UNIT #
 1551

CLIENT NAME	PROJECT NAME & ADDRESS										SAMPLE MATRIX	NUMBER OF CONTAINERS	IDENTIFY PARAMETERS DESIRED AND NO. OF CONTAINERS	PRESERVATION C Chilled H HCL Ot Other (see Remarks)
	SAMPLERS	CONTACT PERSON	DATE SAMPLED	TIME SAMPLED	COMP	GRAB	DATE RECD	TIME RECD	STATION LOCATION / No.	BATCH # (Lab Use Only)				
TT	NEBC	10/3/06				10/3/06	1830				2			
	CONTACT PERSON	10/4/06				10/4/06	1030							
	Sam													
	Bovergeis													
03GP1001														
03GP1101														
03GP1102														
03GP1103														
03GP1104														
03GP1204							1350							
03GP1203							1350							
03GP1202							1420							
03GP1201							1420							
03GP1303														
03GP1302														
03GP1301														
03GP1404							1430							
03GP1403														
03GP1402														
Prelabeled Containers		Date / Time	Received by: (Signature)		Date / Time	Remarks and Observations								
Relinquished by: (Signature)		Date / Time	Received by: (Signature)		Date / Time									
Relinquished by: (Signature)		Date / Time	Received by: (Signature)		Date / Time									

Matrix Types S Soil SW Surface Water GW Ground Water SG Soil Gas



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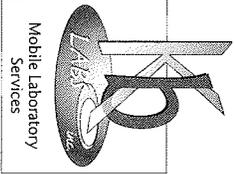
CHAIN-OF-CUSTODY RECORD

4

MOBILE UNIT #
 1881

CLIENT NAME	PROJECT NAME & ADDRESS					SAMPLE MATRIX	NUMBER OF CONTAINERS	IDENTIFY PARAMETERS DESIRED AND NO. OF CONTAINERS	PRESERVATION
	SAMPLERS	CONTACT PERSON	BATCH # (Lab Use Only)	DATE SAMPLED	TIME SAMPLED				
TT		WCBSC	Gulfport						
		Jessie Bourgeois							
SAMPLE FIELD ID \ NUMBER	DATE SAMPLED	TIME SAMPLED	COMP.	GRAB	DATE RECD	TIME RECD	STATION LOCATION / No.	VOLATILES	
03 GP 1701	12/15/06				12/15/06	1440			
03 GP 1503					1620				
03 GP 1502					1630				
03 GP 1501					1630				
03 GP 1604					1740				
03 GP 1603					1800				
03 GP 1602					1800				
03 GP 1601					1820				
03 GP 1704	12/16/06				19/16/06	1000			
03 GP 1703									
03 GP 1702									
03 GP 1701									
03 GP 1804						1130			
03 GP 1803									
03 GP 1802									
Prelabeled Containers Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time		Remarks and Observations	
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time			

Matrix Types S Soil SW Surface Water GW Ground Water SG Soil Gas



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CHAIN-OF-CUSTODY RECORD

5

MOBILE UNIT #
 1281

CLIENT NAME		PROJECT NAME & ADDRESS						SAMPLE MATRIX		IDENTITY PARAMETERS DESIRED AND NO. OF CONTAINERS		PRESERVATION	
TT		NCSB Goldport Jas - Bougeois						SAMPLE MATRIX		VOLATILES		C Chilled H HCL O Other (see Remarks)	
SAMPLERS	CONTACT PERSON	BATCH # (Lab Use Only)	DATE SAMPLED	TIME SAMPLED	COMP	GRAB	DATE RECD	TIME RECD	STATION LOCATION / No.	NUMBER OF CONTAINERS	COMMENT	REMARKS AND OBSERVATIONS	
03 GP 1801			10/16/06				10/16/06	1130		2			
03 GP 1902								1315					
03 GP 1901								1335					
03 GP 2004								1520					
03 GP 2003								1520					
03 GP 2002								1550					
03 GP 2001								1550					
03 GP 2104								1720					
03 GP 2103								1720					
03 GP 2102								1750					
03 GP 2101								1750					
03 GP 2204			10/16/06				10/16/06	0830					
03 GP 2203								0830					
Precleaned Containers Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time		Remarks and Observations					
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time							

Matrix Types S Soil SW Surface Water GW Ground Water SG Soil Gas



KB LABS, INC.
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November 2, 2006

Mark Jonnet
TtNUS
661 Andersen Drive, Foster Plaza 7
Pittsburgh, PA 15220

**RE: NASA CCB III Kennedy Space Center, FL - Final Data Report
KB Labs Project # 06-261**

Dear Mr. Jonnet:

Enclosed is the final report of the on-site analysis performed by KB Labs, Inc. at the above referenced site. Samples were collected and analyzed from October 24 to 27, 2006. Included are a brief project narrative, and data report narrative, tables listing quality control results, final analytical results, and sample chain-of-custody form. This information will also be sent electronically.

KB Labs' mobile laboratories have been inspected by the FDOH Bureau of Laboratories and are NELAP Certified as of April 1, 2003. Our personnel, methodology, proficiency testing, and quality assurance requirements comply with the guidelines of Chapter 62-160 of the Florida Administrative Code and with the consensus standards adopted at the National Environmental Laboratory Accreditation Conference (NELAC). Data for the site referenced above were determined in accordance with published procedures under Test Methods for Evaluating Solid Waste (EPA SW-846, Update III Revised May 1997). Unless otherwise indicated on the quality control narrative accompanying the data report, the quality assurance and quality control procedures performed in conjunction with analysis of groundwater samples demonstrated that the reported data met our requirements for accuracy and precision under NELAC Standards.

If you have any questions, please do not hesitate to call me or Kelly Bergdoll, President of KB Labs, at (352) 367-0073.

Sincerely,

KB Labs, Inc.

Todd Romero
Director of Operations

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PROJECT NARRATIVE

Project Scope

From October 24 to 27, 2006, a total of 80 samples (80 water) were analyzed for TtNUS at NASA CCB, FL. The samples were analyzed for dichlorodifluoromethane, chloromethane, vinyl chloride, bromomethane, chloroethane, freon 113, trichlorofluoromethane, 1,1,-dichloroethene, methylene chloride, t-1,2-dichloroethene, 1,1-dichloroethane, c-1,2- dichloroethene, chloroform, 1,1,1-trichloroethane, carbon tetrachloride, 1,2-dichloroethane, trichloroethene, 1,2-dichloropropane, bromodichloromethane, c-1,3-dichloropropene, t-1,3-dichloropropene, 1,1,2-trichloroethane, tetrachloroethene, dibromochloromethane, 1,2-dibromoethane, chlorobenzene, 1,1,1,2-tetrachloroethane, bromoform, 1,1,1,2,2-tetrachloroethane, 1,3-dichlorobenzene, 1,4-dichlorobenzene, 1,2-dichlorobenzene, 1,2-dibromo-3-chloropropane, and 1,2,4-trichlorobenzene.

NELAP Certification

KB Mobile Labs Unit KB1: FDOH NELAP Certification Number E82815

Analytical Procedure

All samples were analyzed using SW846 Method 5030/8260 for waters. Ten (10) milliliters (mL) of water or air (air samples) were purged with helium and the volatile organic compounds (VOCs) were collected on a solid-phase adsorption trap. The adsorption trap was heated and back-purged with helium. The components were then separated by capillary column gas chromatography and measured with a mass spectrometer (GC/MS) operated in the electron impact full-scan mode. The individual VOCs in the samples were measured against corresponding VOC standards.

Analytical Results

Laboratory results were provided to the client on an as-completed or next-day basis. Final results of the on-site analyses are provided in a hardcopy report. The data produced and reported in the field has been reviewed and approved for this final report by the Director of Operations for KB Labs.

Quality Control (QC) Data

Surrogate Recoveries – Table 1 lists the daily analytical sequence and percent recovery results for surrogate compounds, which were added to all analyses. Four (4) surrogate

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compounds were added to each analysis in order to continually monitor general method performance.

VOC Spike Recoveries – Table 2 lists the percent recovery results for matrix spike and laboratory control samples. A known amount of each target compound was added to selected field samples and to laboratory reagent water in order to monitor the performance of each of the target compounds in the actual matrix and in laboratory reagent water.

Method Blanks – Daily analysis of laboratory reagent water samples was performed in order to monitor the cleanliness of the analytical system.

DATA REPORT NARRATIVE

1. All sample data has been reviewed and, if required, updated in the Final Data Report for rounding and significant figures.
2. 1,1,1,2-Tetrachloroethane was not reported on the Preliminary Data.
3. Sample ID CCB-DPT09-45 reported trichloroethene 34 ug/L changed to <2.0ug/L.
4. Sample ID CCB-DPT55-55 reported t-1,2-dichloroethene <10 ug/L changed to 10 ug/L.
5. Sample ID CCB-DPT56-15 reported trichloroethene 1.1 ug/L changed to <1.0ug/L.
6. Compounds for sample ID CCB-DPT50-70 eluting after 5.0-minute retention time are estimated. GCMS quant file was not saved when computer crashed. Analyst saw no hits prior to crash but there is not documentation to verify. No sample was available to reanalyze.

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KB LABS, INC.

Table 1: Analytical Run Sequence/Surrogate Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Brad Weichert
Site: NASA CCB III	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No: 06-261
On-site Dates: 10/24/06-10/27/06	Client Project Manager: Mark Jonnet	Matrix: Water

Sample ID	Date of Analysis	Surrogate % Recovery				Surrogate Control Limits			
		S1*	S2*	S3*	S4*	S1*	S2*	S3*	S4*
VSTD 20	10/24/06	84	97	126	110	Pass	Pass	> UCL	Pass
BLANK	10/24/06	122	102	98	98	Pass	Pass	Pass	Pass
1UG/L	10/24/06	149	109	100	98	> UCL	Pass	Pass	Pass
5UG/L	10/24/06	53	100	120	99	< LCL	Pass	> UCL	Pass
10UG/L	10/24/06	6	88	122	100	< LCL	Pass	> UCL	Pass
20UG/L	10/24/06	75	90	121	102	Pass	Pass	> UCL	Pass
50UG/L	10/24/06	88	92	124	109	Pass	Pass	> UCL	Pass
100UG/L	10/24/06	85	84	123	112	Pass	Pass	> UCL	Pass
BLANK	10/24/06	122	102	98	98	Pass	Pass	Pass	Pass
DPT41-45	10/24/06	123	102	98	97	Pass	Pass	Pass	Pass
DPT41-55	10/24/06	124	102	101	97	Pass	Pass	Pass	Pass
DPT42-45	10/24/06	125	101	101	95	Pass	Pass	Pass	Pass
DPT42-55	10/24/06	125	103	101	96	Pass	Pass	Pass	Pass
DPT43-45 1:5	10/24/06	127	105	97	94	Pass	Pass	Pass	Pass
DPT43-55 1:100	10/24/06	125	96	101	92	Pass	Pass	Pass	Pass
DPT44-45	10/24/06	124	101	97	94	Pass	Pass	Pass	Pass
DPT44-55	10/24/06	10	93	99	93	< LCL	Pass	Pass	Pass
DPT55-15	10/24/06	127	104	96	95	Pass	Pass	Pass	Pass
DPT55-25 1:100	10/24/06	111	104	97	93	Pass	Pass	Pass	Pass
DPT55-35 1:20	10/24/06	4	106	96	97	< LCL	Pass	Pass	Pass
DPT55-55	10/24/06	123	102	100	96	Pass	Pass	Pass	Pass
DPT55-45 1:10	10/24/06	130	105	100	96	Pass	Pass	Pass	Pass
DPT55-70 1:5	10/24/06	127	103	100	96	Pass	Pass	Pass	Pass
DPT56-15	10/24/06	130	102	100	95	Pass	Pass	Pass	Pass
DPT56-25 1:1000	10/24/06	126	103	98	94	Pass	Pass	Pass	Pass
DPT56-35 1:500	10/24/06	129	104	97	95	Pass	Pass	Pass	Pass
DPT56-45 1:50	10/24/06	132	108	98	94	> UCL	Pass	Pass	Pass
DPT56-55 1:2	10/24/06	134	113	96	94	> UCL	Pass	Pass	Pass
DPT56-70 1:50	10/24/06	130	107	95	95	Pass	Pass	Pass	Pass
DPT09-45 1:2	10/24/06	120	101	97	92	Pass	Pass	Pass	Pass
DPT09-55	10/24/06	131	111	98	97	> UCL	Pass	Pass	Pass
DPT09-55 MS	10/24/06	127	110	97	99	Pass	Pass	Pass	Pass
DPT09-55 MSD	10/24/06	122	96	100	100	Pass	Pass	Pass	Pass
LCS	10/24/06	111	98	98	98	Pass	Pass	Pass	Pass
CCS	10/24/06	120	98	95	98	Pass	Pass	Pass	Pass
CCS	10/25/06	120	97	103	101	Pass	Pass	Pass	Pass
BLANK	10/25/06	116	96	101	94	Pass	Pass	Pass	Pass
DPT09-45 1:100	10/25/06	128	100	96	97	Pass	Pass	Pass	Pass
DPT61-15	10/25/06	128	100	99	94	Pass	Pass	Pass	Pass
DPT61-25	10/25/06	128	102	97	94	Pass	Pass	Pass	Pass
DPT61-35	10/25/06	131	102	98	95	> UCL	Pass	Pass	Pass

***Surrogate Compounds:**

S1 = Dibromofluoromethane (70% - 130%)
 S2 = 1,2- Dichloroethane-D4 (48% - 147%)
 S3 = Toluene-D8 (82% - 116%)
 S4 = 4-Bromofluorobenzene (65% - 133%)

KB LABS, INC.

Table 1: Analytical Run Sequence/Surrogate Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Brad Weichert
Site: NASA CCB III	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No: 06-261
On-site Dates: 10/24/06-10/27/06	Client Project Manager: Mark Jonnet	Matrix: Water

Sample ID	Date of Analysis	Surrogate % Recovery				Surrogate Control Limits			
		S1*	S2*	S3*	S4*	S1*	S2*	S3*	S4*
DPT61-45	10/25/06	131	105	97	96	> UCL	Pass	Pass	Pass
DPT61-55	10/25/06	128	102	97	93	Pass	Pass	Pass	Pass
DPT61-70	10/25/06	122	103	99	97	Pass	Pass	Pass	Pass
DPT62-15 1:20	10/25/06	129	106	95	94	Pass	Pass	Pass	Pass
DPT62-25 1:10	10/25/06	130	109	95	93	Pass	Pass	Pass	Pass
DPT62-35 1:20	10/25/06	131	104	96	92	> UCL	Pass	Pass	Pass
DPT62-45	10/25/06	132	106	96	92	> UCL	Pass	Pass	Pass
FDSA-MW0021252	10/25/06	136	116	96	95	> UCL	Pass	Pass	Pass
DPT62-55 1:5	10/25/06	136	111	94	95	> UCL	Pass	Pass	Pass
DPT62-70 1:10	10/25/06	126	111	96	93	Pass	Pass	Pass	Pass
DPT63-15	10/25/06	134	108	96	92	> UCL	Pass	Pass	Pass
DPT63-25	10/25/06	130	101	94	94	Pass	Pass	Pass	Pass
DPT63-35	10/25/06	133	106	96	93	> UCL	Pass	Pass	Pass
DPT63-55	10/25/06	128	105	96	95	Pass	Pass	Pass	Pass
DPT63-45	10/25/06	132	106	96	96	> UCL	Pass	Pass	Pass
DPT63-70	10/25/06	131	104	98	94	> UCL	Pass	Pass	Pass
DPT64-15	10/25/06	128	103	97	95	Pass	Pass	Pass	Pass
DPT64-25 1:5	10/25/06	124	108	96	95	Pass	Pass	Pass	Pass
DPT64-35	10/25/06	130	108	97	94	Pass	Pass	Pass	Pass
DPT64-35 MS	10/25/06	126	99	98	99	Pass	Pass	Pass	Pass
DPT64-35 MSD	10/25/06	126	101	97	99	Pass	Pass	Pass	Pass
LCS	10/25/06	122	106	97	100	Pass	Pass	Pass	Pass
CCS	10/25/06	126	102	98	100	Pass	Pass	Pass	Pass
CCS	10/26/06	129	102	99	99	Pass	Pass	Pass	Pass
BLANK	10/26/06	130	104	100	96	Pass	Pass	Pass	Pass
DPT64-45	10/26/06	129	101	97	95	Pass	Pass	Pass	Pass
DPT64-55	10/26/06	115	91	98	95	Pass	Pass	Pass	Pass
DPT64-70 1:5	10/26/06	118	95	97	95	Pass	Pass	Pass	Pass
DPT65-15 1:100	10/26/06	112	98	96	92	Pass	Pass	Pass	Pass
DPT65-25	10/26/06	126	100	98	95	Pass	Pass	Pass	Pass
DPT65-35	10/26/06	116	96	94	95	Pass	Pass	Pass	Pass
DPT65-45 1:5	10/26/06	114	93	96	94	Pass	Pass	Pass	Pass
DPT65-55 1:10	10/26/06	116	95	97	95	Pass	Pass	Pass	Pass
DPT65-70 1:10	10/26/06	102	84	97	94	Pass	Pass	Pass	Pass
DPT49-15	10/26/06	132	110	98	94	> UCL	Pass	Pass	Pass

***Surrogate Compounds:**

S1 = Dibromofluoromethane (70% - 130%)
 S2 = 1,2- Dichloroethane-D4 (48% - 147%)
 S3 = Toluene-D8 (82% - 116%)
 S4 = 4-Bromofluorobenzene (65% - 133%)

KB LABS, INC.

Table 1: Analytical Run Sequence/Surrogate Percent Recoveries

Client: TtNUS	Driller/Sampler: TtNUS	Analyst: Brad Weichert
Site: NASA CCB III	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No: 06-261
On-site Dates: 10/24/06-10/27/06	Client Project Manager: Mark Jonnet	Matrix: Water

Sample ID	Date of Analysis	Surrogate % Recovery				Surrogate Control Limits			
		S1*	S2*	S3*	S4*	S1*	S2*	S3*	S4*
DPT49-25	10/26/06	119	97	97	93	Pass	Pass	Pass	Pass
DPT49-35	10/26/06	119	100	96	94	Pass	Pass	Pass	Pass
DPT-49 45	10/26/06	120	99	96	95	Pass	Pass	Pass	Pass
DPT49-55	10/26/06	120	98	97	94	Pass	Pass	Pass	Pass
DPT49-70	10/26/06	114	96	96	93	Pass	Pass	Pass	Pass
DPT36-15 1:5000	10/26/06	119	98	93	94	Pass	Pass	Pass	Pass
DPT52-70 1:40	10/26/06	130	109	96	95	Pass	Pass	Pass	Pass
DPT43-70	10/26/06	129	106	96	94	Pass	Pass	Pass	Pass
DPT66-15 1:500	10/26/06	125	103	97	95	Pass	Pass	Pass	Pass
DPT66-25	10/26/06	128	102	96	96	Pass	Pass	Pass	Pass
DPT49-55 MS	10/26/06	126	109	96	99	Pass	Pass	Pass	Pass
DPT49-55 MSD	10/26/06	124	110	98	100	Pass	Pass	Pass	Pass
LCS	10/26/06	126	98	96	98	Pass	Pass	Pass	Pass
CCS	10/26/06	127	111	95	100	Pass	Pass	Pass	Pass
CCS	10/27/06	125	105	100	102	Pass	Pass	Pass	Pass
BLANK	10/27/06	134	108	97	94	> UCL	Pass	Pass	Pass
DPT66-35 1:100	10/27/06	128	101	97	93	Pass	Pass	Pass	Pass
DPT66-45 1:20	10/27/06	130	103	96	96	Pass	Pass	Pass	Pass
DPT66-55 1:5	10/27/06	130	105	97	95	Pass	Pass	Pass	Pass
DPT66-70 1:10	10/27/06	129	103	98	96	Pass	Pass	Pass	Pass
DPT67-15 1:10	10/27/06	130	102	96	94	Pass	Pass	Pass	Pass
DPT67-25	10/27/06	132	106	99	94	> UCL	Pass	Pass	Pass
DPT67-35	10/27/06	130	104	96	95	Pass	Pass	Pass	Pass
DPT67-45	10/27/06	134	112	94	95	> UCL	Pass	Pass	Pass
DPT67-55	10/27/06	120	101	96	93	Pass	Pass	Pass	Pass
DPT67-70	10/27/06	80	100	102	111	Pass	Pass	Pass	Pass
DPT50-15	10/27/06	131	104	98	96	> UCL	Pass	Pass	Pass
DPT50-25 1:500	10/27/06	117	93	95	94	Pass	Pass	Pass	Pass
DPT50-35 1:1000	10/27/06	116	96	96	95	Pass	Pass	Pass	Pass
DPT50-45 1:10	10/27/06	116	95	96	94	Pass	Pass	Pass	Pass
DPT50-55 1:5	10/27/06	128	99	96	94	Pass	Pass	Pass	Pass
DPT50-70 1:1000	10/27/06	117	95	NA	NA	Pass	Pass	NA	NA
DPT67-55 MS	10/27/06	124	96	98	99	Pass	Pass	Pass	Pass
DPT67-55 MSD	10/27/06	121	94	98	100	Pass	Pass	Pass	Pass
LCS	10/27/06	124	95	97	100	Pass	Pass	Pass	Pass
CCS	10/27/06	122	97	97	99	Pass	Pass	Pass	Pass

Comments: Although some surrogates may be out of the control percent recovery range, other supporting QC, such as matrix spikes, matrix spike duplicates, method blanks, and laboratory control samples, are performed by KB Labs to further validate reported data.

***Surrogate Compounds:**

- S1 = Dibromofluoromethane (70% - 130%)
- S2 = 1,2- Dichloroethane-D4 (48% - 147%)
- S3 = Toluene-D8 (82% - 116%)
- S4 = 4-Bromofluorobenzene (65% - 133%)

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: Tetra Tech NUS	Driller/Sampler: TtNUS	Analyst: Brad Weichert
Site: NASA CCB III	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-261
On-site Dates: 10/24/06-10/27/06	Client Project Manager: Mark Jonnet	Matrix: Water

Matrix Spike/Matrix Spike Duplicate (MS/MSD):

Samples: DPT09-55 MS DPT09-55 MSD	Date of Analysis: 10/24/2006								
Matrix Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	RPD	MS	MSD	RPD	MS	MSD	RPD
Dichlorodifluoromethane	90	120	20	103	100	3	Pass	Pass	Pass
Chloromethane	39	142	20	84	91	7	Pass	Pass	Pass
Vinyl Chloride	20	187	20	81	90	11	Pass	Pass	Pass
Bromomethane	70	130	20	97	114	16	Pass	Pass	Pass
Chloroethane	70	130	20	98	106	8	Pass	Pass	Pass
Trichlorofluoromethane	56	149	20	92	103	11	Pass	Pass	Pass
Freon 113	70	130	20	92	103	11	Pass	Pass	Pass
1,1-Dichloroethene	52	144	20	79	87	10	Pass	Pass	Pass
Methylene Chloride	47	148	20	86	92	7	Pass	Pass	Pass
trans-1,2-Dichloroethene	41	157	20	87	97	10	Pass	Pass	Pass
1,1-Dichloroethane	69	134	20	89	95	7	Pass	Pass	Pass
cis-1,2-Dichloroethene	59	143	20	89	98	10	Pass	Pass	Pass
Chloroform	64	148	20	86	95	10	Pass	Pass	Pass
1,1,1-Trichloroethane	53	147	20	88	98	10	Pass	Pass	Pass
Carbon Tetrachloride	51	161	20	93	105	12	Pass	Pass	Pass
1,2-Dichloroethane	51	163	20	84	91	8	Pass	Pass	Pass
Trichloroethene	50	147	20	84	95	12	Pass	Pass	Pass
1,2-Dichloropropane	62	150	20	90	100	10	Pass	Pass	Pass
Bromodichloromethane	58	156	20	93	102	10	Pass	Pass	Pass
c-1,3-Dichloropropene	53	169	20	103	114	11	Pass	Pass	Pass
t-1,3-Dichloropropene	72	154	20	120	132	10	Pass	Pass	Pass
1,1,2-Trichloroethane	64	144	20	102	113	10	Pass	Pass	Pass
Tetrachloroethene	56	138	20	87	100	13	Pass	Pass	Pass
Dibromochloromethane	69	147	20	105	116	10	Pass	Pass	Pass
1,2-Dibromoethane	70	130	20	106	118	11	Pass	Pass	Pass
Chlorobenzene	83	128	20	89	102	14	Pass	Pass	Pass
1,1,1,2-Tetrachloroethane	70	130	20	100	112	11	Pass	Pass	Pass
Bromoform	59	157	20	102	116	13	Pass	Pass	Pass
1,1,2,2-Tetrachloroethane	70	130	20	96	111	15	Pass	Pass	Pass
1,3-Dichlorobenzene	74	117	20	87	101	15	Pass	Pass	Pass
1,4-Dichlorobenzene	76	116	20	88	100	12	Pass	Pass	Pass
1,2-Dichlorobenzene	72	124	20	90	105	16	Pass	Pass	Pass
1,2-Dibromo-3-chloropropan	44	182	20	83	91	10	Pass	Pass	Pass
1,2,4-Trichlorobenzene	57	102	20	87	105	19	Pass	> UCL	Pass

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit.

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: Tetra Tech NUS	Driller/Sampler: TtNUS	Analyst: Brad Weichert
Site: NASA CCB III	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-261
On-site Dates: 10/24/06-10/27/06	Client Project Manager: Mark Jonnet	Matrix: Water

Samples:		Date of Analysis: 10/25/2006							
DPT64-35 MS									
DPT64-35 MSD									
Matrix Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	RPD	MS	MSD	RPD	MS	MSD	RPD
Dichlorodifluoromethane	90	120	20	75	84	12	< LCL	< LCL	Pass
Chloromethane	39	142	20	75	79	5	Pass	Pass	Pass
Vinyl Chloride	20	187	20	81	88	8	Pass	Pass	Pass
Bromomethane	70	130	20	94	102	8	Pass	Pass	Pass
Chloroethane	70	130	20	82	94	13	Pass	Pass	Pass
Trichlorofluoromethane	56	149	20	83	90	8	Pass	Pass	Pass
Freon 113	70	130	20	91	100	9	Pass	Pass	Pass
1,1-Dichloroethene	52	144	20	72	81	11	Pass	Pass	Pass
Methylene Chloride	47	148	20	84	93	11	Pass	Pass	Pass
trans-1,2-Dichloroethene	41	157	20	83	92	11	Pass	Pass	Pass
1,1-Dichloroethane	69	134	20	83	93	11	Pass	Pass	Pass
cis-1,2-Dichloroethene	59	143	20	82	93	13	Pass	Pass	Pass
Chloroform	64	148	20	85	95	11	Pass	Pass	Pass
1,1,1-Trichloroethane	53	147	20	85	93	9	Pass	Pass	Pass
Carbon Tetrachloride	51	161	20	88	97	9	Pass	Pass	Pass
1,2-Dichloroethane	51	163	20	83	93	11	Pass	Pass	Pass
Trichloroethene	50	147	20	82	91	10	Pass	Pass	Pass
1,2-Dichloropropane	62	150	20	88	99	12	Pass	Pass	Pass
Bromodichloromethane	58	156	20	88	98	11	Pass	Pass	Pass
c-1,3-Dichloropropene	53	169	20	105	110	5	Pass	Pass	Pass
t-1,3-Dichloropropene	72	154	20	119	130	9	Pass	Pass	Pass
1,1,2-Trichloroethane	64	144	20	105	116	10	Pass	Pass	Pass
Tetrachloroethene	56	138	20	86	94	8	Pass	Pass	Pass
Dibromochloromethane	69	147	20	104	112	8	Pass	Pass	Pass
1,2-Dibromoethane	70	130	20	110	121	10	Pass	Pass	Pass
Chlorobenzene	83	128	20	87	97	11	Pass	Pass	Pass
1,1,1,2-Tetrachloroethane	70	130	20	98	107	9	Pass	Pass	Pass
Bromoform	59	157	20	104	110	5	Pass	Pass	Pass
1,1,2,2-Tetrachloroethane	70	130	20	104	119	14	Pass	Pass	Pass
1,3-Dichlorobenzene	74	117	20	88	99	12	Pass	Pass	Pass
1,4-Dichlorobenzene	76	116	20	88	100	13	Pass	Pass	Pass
1,2-Dichlorobenzene	72	124	20	90	102	12	Pass	Pass	Pass
1,2-Dibromo-3-chloropropan	44	182	20	86	98	13	Pass	Pass	Pass
1,2,4-Trichlorobenzene	57	102	20	91	106	15	Pass	> UCL	Pass

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit.

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: Tetra Tech NUS	Driller/Sampler: TtNUS	Analyst: Brad Weichert
Site: NASA CCB III	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-261
On-site Dates: 10/24/06-10/27/06	Client Project Manager: Mark Jonnet	Matrix: Water

Samples: DPT49-55 MS DPT49-55 MSD	Date of Analysis: 10/26/2006
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Matrix Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	RPD	MS	MSD	RPD	MS	MSD	RPD
Dichlorodifluoromethane	90	120	20	84	81	4	< LCL	< LCL	Pass
Chloromethane	39	142	20	82	78	4	Pass	Pass	Pass
Vinyl Chloride	20	187	20	90	87	3	Pass	Pass	Pass
Bromomethane	70	130	20	108	104	4	Pass	Pass	Pass
Chloroethane	70	130	20	98	95	3	Pass	Pass	Pass
Trichlorofluoromethane	56	149	20	96	96	1	Pass	Pass	Pass
Freon 113	70	130	20	101	98	3	Pass	Pass	Pass
1,1-Dichloroethene	52	144	20	82	80	3	Pass	Pass	Pass
Methylene Chloride	47	148	20	97	90	8	Pass	Pass	Pass
trans-1,2-Dichloroethene	41	157	20	92	89	3	Pass	Pass	Pass
1,1-Dichloroethane	69	134	20	97	92	5	Pass	Pass	Pass
cis-1,2-Dichloroethene	59	143	20	97	93	4	Pass	Pass	Pass
Chloroform	64	148	20	95	90	5	Pass	Pass	Pass
1,1,1-Trichloroethane	53	147	20	96	92	4	Pass	Pass	Pass
Carbon Tetrachloride	51	161	20	102	96	6	Pass	Pass	Pass
1,2-Dichloroethane	51	163	20	92	90	2	Pass	Pass	Pass
Trichloroethene	50	147	20	94	89	5	Pass	Pass	Pass
1,2-Dichloropropane	62	150	20	99	95	4	Pass	Pass	Pass
Bromodichloromethane	58	156	20	101	97	4	Pass	Pass	Pass
c-1,3-Dichloropropene	53	169	20	117	113	3	Pass	Pass	Pass
t-1,3-Dichloropropene	72	154	20	133	130	2	Pass	Pass	Pass
1,1,2-Trichloroethane	64	144	20	117	111	5	Pass	Pass	Pass
Tetrachloroethene	56	138	20	96	95	1	Pass	Pass	Pass
Dibromochloromethane	69	147	20	115	114	1	Pass	Pass	Pass
1,2-Dibromoethane	70	130	20	120	117	3	Pass	Pass	Pass
Chlorobenzene	83	128	20	99	96	3	Pass	Pass	Pass
1,1,1,2-Tetrachloroethane	70	130	20	107	104	3	Pass	Pass	Pass
Bromoform	59	157	20	116	116	0	Pass	Pass	Pass
1,1,2,2-Tetrachloroethane	70	130	20	114	114	1	Pass	Pass	Pass
1,3-Dichlorobenzene	74	117	20	100	97	3	Pass	Pass	Pass
1,4-Dichlorobenzene	76	116	20	101	99	1	Pass	Pass	Pass
1,2-Dichlorobenzene	72	124	20	102	102	0	Pass	Pass	Pass
1,2-Dibromo-3-chloropropan	44	182	20	92	95	3	Pass	Pass	Pass
1,2,4-Trichlorobenzene	57	102	20	103	103	0	> UCL	> UCL	Pass

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit.

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: Tetra Tech NUS	Driller/Sampler: TtNUS	Analyst: Brad Weichert
Site: NASA CCB III	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-261
On-site Dates: 10/24/06-10/27/06	Client Project Manager: Mark Jonnet	Matrix: Water

Samples:		Date of Analysis: 10/27/2006							
DPT67-55 MS									
DPT67-55 MSD									
Matrix Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	RPD	MS	MSD	RPD	MS	MSD	RPD
Dichlorodifluoromethane	90	120	20	100	96	4	Pass	Pass	Pass
Chloromethane	39	142	20	92	87	5	Pass	Pass	Pass
Vinyl Chloride	20	187	20	98	97	1	Pass	Pass	Pass
Bromomethane	70	130	20	122	115	5	Pass	Pass	Pass
Chloroethane	70	130	20	104	98	7	Pass	Pass	Pass
Trichlorofluoromethane	56	149	20	104	96	7	Pass	Pass	Pass
Freon 113	70	130	20	106	94	12	Pass	Pass	Pass
1,1-Dichloroethene	52	144	20	87	81	7	Pass	Pass	Pass
Methylene Chloride	47	148	20	85	85	0	Pass	Pass	Pass
trans-1,2-Dichloroethene	41	157	20	94	91	3	Pass	Pass	Pass
1,1-Dichloroethane	69	134	20	93	89	4	Pass	Pass	Pass
cis-1,2-Dichloroethene	59	143	20	86	91	5	Pass	Pass	Pass
Chloroform	64	148	20	90	88	3	Pass	Pass	Pass
1,1,1-Trichloroethane	53	147	20	91	90	1	Pass	Pass	Pass
Carbon Tetrachloride	51	161	20	100	96	4	Pass	Pass	Pass
1,2-Dichloroethane	51	163	20	88	85	3	Pass	Pass	Pass
Trichloroethene	50	147	20	92	89	3	Pass	Pass	Pass
1,2-Dichloropropane	62	150	20	92	93	2	Pass	Pass	Pass
Bromodichloromethane	58	156	20	96	93	3	Pass	Pass	Pass
c-1,3-Dichloropropene	53	169	20	112	112	0	Pass	Pass	Pass
t-1,3-Dichloropropene	72	154	20	114	129	12	Pass	Pass	Pass
1,1,2-Trichloroethane	64	144	20	108	109	2	Pass	Pass	Pass
Tetrachloroethene	56	138	20	97	93	4	Pass	Pass	Pass
Dibromochloromethane	69	147	20	107	110	3	Pass	Pass	Pass
1,2-Dibromoethane	70	130	20	113	115	2	Pass	Pass	Pass
Chlorobenzene	83	128	20	96	96	0	Pass	Pass	Pass
1,1,1,2-Tetrachloroethane	70	130	20	102	104	1	Pass	Pass	Pass
Bromoform	59	157	20	110	111	1	Pass	Pass	Pass
1,1,2,2-Tetrachloroethane	70	130	20	107	107	0	Pass	Pass	Pass
1,3-Dichlorobenzene	74	117	20	96	98	2	Pass	Pass	Pass
1,4-Dichlorobenzene	76	116	20	94	99	5	Pass	Pass	Pass
1,2-Dichlorobenzene	72	124	20	98	99	2	Pass	Pass	Pass
1,2-Dibromo-3-chloropropan	44	182	20	80	89	10	Pass	Pass	Pass
1,2,4-Trichlorobenzene	57	102	20	99	104	5	Pass	> UCL	Pass

Note: Control Limits are based on a semi-annual historical evaluation of mobile unit.

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: Tetra Tech NUS	Driller/Sampler: TtNUS	Analyst: Brad Weichert
Site: NASA CCB III	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-261
On-site Dates: 10/24/06-10/27/06	Client Project Manager: Mark Jonnet	Matrix: Water

Laboratory Control Spikes (LCS):

Samples:	LCS 1	Date of Analysis:	10/24/2006						
	LCS 2		10/25/2006						
	LCS 3		10/26/2006						
Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower		Upper	LCS#1	LCS#2	LCS#3	LCS#1	LCS#2	LCS#3
Dichlorodifluoromethane	70	to	130	84	87	95	Pass	Pass	Pass
Chloromethane	70	to	130	82	81	79	Pass	Pass	Pass
Vinyl Chloride	55	to	148	87	86	87	Pass	Pass	Pass
Bromomethane	70	to	130	95	100	105	Pass	Pass	Pass
Chloroethane	70	to	130	96	86	86	Pass	Pass	Pass
Trichlorofluoromethane	70	to	130	89	91	94	Pass	Pass	Pass
Freon 113	70	to	130	87	93	99	Pass	Pass	Pass
1,1-Dichloroethene	56	to	145	78	78	78	Pass	Pass	Pass
Methylene Chloride	70	to	130	84	87	91	Pass	Pass	Pass
trans-1,2-Dichloroethene	54	to	138	85	88	89	Pass	Pass	Pass
1,1-Dichloroethane	70	to	130	88	89	93	Pass	Pass	Pass
cis-1,2-Dichloroethene	70	to	122	86	90	96	Pass	Pass	Pass
Chloroform	70	to	130	85	91	93	Pass	Pass	Pass
1,1,1-Trichloroethane	70	to	130	86	88	93	Pass	Pass	Pass
Carbon Tetrachloride	70	to	130	90	95	103	Pass	Pass	Pass
1,2-Dichloroethane	70	to	130	81	91	92	Pass	Pass	Pass
Trichloroethene	67	to	118	88	91	93	Pass	Pass	Pass
1,2-Dichloropropane	70	to	130	89	94	96	Pass	Pass	Pass
Bromodichloromethane	70	to	130	89	99	103	Pass	Pass	Pass
c-1,3-Dichloropropene	70	to	130	99	112	116	Pass	Pass	Pass
t-1,3-Dichloropropene	70	to	130	123	133	134	Pass	> UCL	> UCL
1,1,2-Trichloroethane	70	to	130	105	115	119	Pass	Pass	Pass
Tetrachloroethene	75	to	131	94	93	95	Pass	Pass	Pass
Dibromochloromethane	70	to	130	110	117	119	Pass	Pass	Pass
1,2-Dibromoethane	64	to	115	111	126	124	Pass	> UCL	> UCL
Chlorobenzene	70	to	126	97	96	98	Pass	Pass	Pass
1,1,1,2-Tetrachloroethane	70	to	130	107	107	108	Pass	Pass	Pass
Bromoform	53	to	147	108	121	122	Pass	Pass	Pass
1,1,2,2-Tetrachloroethane	70	to	130	99	117	119	Pass	Pass	Pass
1,3-Dichlorobenzene	70	to	130	95	97	100	Pass	Pass	Pass
1,4-Dichlorobenzene	70	to	130	93	97	98	Pass	Pass	Pass
1,2-Dichlorobenzene	70	to	130	100	103	103	Pass	Pass	Pass
1,2-Dibromo-3-chloropropan	70	to	130	90	101	95	Pass	Pass	Pass
1,2,4-Trichlorobenzene	85	to	134	99	108	108	Pass	Pass	Pass

Note: Control limits are based on method guidance.

KB LABS, INC.

Table 2: VOC Spike Compound Percent Recoveries

Client: Tetra Tech NUS	Driller/Sampler: TtNUS	Analyst: Brad Weichert
Site: NASA CCB III	KB Labs Project Manager: Kelly Bergdoll	KB Labs Project No.: 06-261
On-site Dates: 10/24/06-10/27/06	Client Project Manager: Mark Jonnet	Matrix: Water

Samples: LCS 4		Date of Analysis: 10/27/2006							
Spike Compounds	Control Limits			Percent Recoveries			Control Limit Checks		
	Lower	Upper	LCS#4			LCS#4			
Dichlorodifluoromethane	70	to	130	107			Pass		
Chloromethane	70	to	130	98			Pass		
Vinyl Chloride	55	to	148	102			Pass		
Bromomethane	70	to	130	146			> UCL		
Chloroethane	70	to	130	113			Pass		
Trichlorofluoromethane	70	to	130	106			Pass		
Freon 113	70	to	130	108			Pass		
1,1-Dichloroethene	56	to	145	89			Pass		
Methylene Chloride	70	to	130	97			Pass		
trans-1,2-Dichloroethene	54	to	138	99			Pass		
1,1-Dichloroethane	70	to	130	101			Pass		
cis-1,2-Dichloroethene	70	to	122	99			Pass		
Chloroform	70	to	130	97			Pass		
1,1,1-Trichloroethane	70	to	130	98			Pass		
Carbon Tetrachloride	70	to	130	107			Pass		
1,2-Dichloroethane	70	to	130	93			Pass		
Trichloroethene	67	to	118	99			Pass		
1,2-Dichloropropane	70	to	130	101			Pass		
Bromodichloromethane	70	to	130	104			Pass		
c-1,3-Dichloropropene	70	to	130	122			Pass		
t-1,3-Dichloropropene	70	to	130	141			> UCL		
1,1,2-Trichloroethane	70	to	130	119			Pass		
Tetrachloroethene	75	to	131	105			Pass		
Dibromochloromethane	70	to	130	121			Pass		
1,2-Dibromoethane	64	to	115	126			> UCL		
Chlorobenzene	70	to	126	106			Pass		
1,1,1,2-Tetrachloroethane	70	to	130	112			Pass		
Bromoform	53	to	147	123			Pass		
1,1,2,2-Tetrachloroethane	70	to	130	118			Pass		
1,3-Dichlorobenzene	70	to	130	105			Pass		
1,4-Dichlorobenzene	70	to	130	107			Pass		
1,2-Dichlorobenzene	70	to	130	109			Pass		
1,2-Dibromo-3-chloropropan	70	to	130	97			Pass		
1,2,4-Trichlorobenzene	85	to	134	114			Pass		

Note: Control limits are based on method guidance.

KB LABS, INC.

Final Data Report: NASA CCB III

October 24 to 27, 2006
Prepared for: Tetra Tech NUS

	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID				
	CCB - DPT41-45	CCB - DPT41-55	CCB - DPT42-45	CCB - DPT42-55	CCB - DPT43 - 45	CCB - DPT43 - 55	CCB - DPT44-45	CCB - DPT44-55	CCB - DPT55-15	CCB - DPT55-25	CCB - DPT55-35
Date of Analysis:	10/24/06	10/24/06	10/24/06	10/24/06	10/24/06	10/24/06	10/24/06	10/24/06	10/24/06	10/24/06	10/24/06
Matrix:	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Dilution Factor:	1	1	1	1	5	100	1	1	1	100	20
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
Chloromethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
Vinyl chloride	< 1.0	< 1.0	< 1.0	< 1.0	11	130	1.7	< 1.0	7.3	<100	560
Bromomethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
Chloroethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
Freon 113	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
Methylene Chloride	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
t-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	38
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
c-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	240	4300	3.4	< 1.0	85.0	3100	840
Chloroform	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
Trichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	8.0	110	< 1.0	< 1.0	27.1	<100	< 20
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
Bromodichloromethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
c-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
t,1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
Tetrachloroethene	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
Dibromochloromethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
1,2-Dibromoethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
Chlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
Bromoform	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
1,1,1,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
1,3-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
1,4-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
1,2-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
1,2-Dibromo-3-chloropropane	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20
1,2,4-Trichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 100	< 1.0	< 1.0	< 1.0	<100	< 20

Units for waters are ug/L and for soils are mg/Kg.

KB LABS, INC.

Final Data Report: NASA CCB III

October 24 to 27, 2006
Prepared for: Tetra Tech NUS

	Sample ID										
	CCB - DPT55-45	CCB - DPT55-55	CCB - DPT55-70	CCB - DPT56-15	CCB - DPT56-25	CCB - DPT56-35	CCB - DPT56-45	CCB - DPT56-55	CCB - DPT56-70	CCB - DPT09-45	CCB - DPT09-55
Date of Analysis:	10/24/06	10/24/06	10/24/06	10/24/06	10/24/06	10/24/06	10/24/2006	10/24/06	10/24/06	10/24/06	10/24/06
Matrix:	Water										
Dilution Factor:	10	1	5	1	1000	500	50	2	50	2,100	1
Dichlorodifluoromethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
Chloromethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
Vinyl chloride	460	1.3	29	4.8	<1000	<500	240	< 2.0	<50	2100	3.2
Bromomethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
Chloroethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
Trichlorofluoromethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
Freon 113	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
1,1-Dichloroethene	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
Methylene Chloride	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
t-1,2-Dichloroethene	10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	5.3	< 1.0
1,1-Dichloroethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
c-1,2-Dichloroethene	320	15.3	270	6.2	15000	4400	1300	44	640	63	< 1.0
Chloroform	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
1,1,1-Trichloroethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
Carbon Tetrachloride	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
1,2-Dichloroethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
Trichloroethene	< 10	1.1	9.0	< 1.0	7700	3600	76	37	540	< 2.0	< 1.0
1,2-Dichloropropane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
Bromodichloromethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
c-1,3-Dichloropropene	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
t,1,3-Dichloropropene	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
1,1,2-Trichloroethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
Tetrachloroethene	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
Dibromochloromethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
1,2-Dibromoethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
Chlorobenzene	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
Bromoform	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
1,1,1,2-Tetrachloroethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
1,1,2,2-Tetrachloroethane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
1,3-Dichlorobenzene	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
1,4-Dichlorobenzene	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
1,2-Dichlorobenzene	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
1,2-Dibromo-3-chloropropane	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0
1,2,4-Trichlorobenzene	< 10	< 1.0	< 5.0	< 1.0	<1000	<500	<50	< 2.0	<50	< 2.0	< 1.0

Units for waters are ug/L and for soils are mg/Kg.

KB LABS, INC.

Final Data Report: NASA CCB III

October 24 to 27, 2006
Prepared for: Tetra Tech NUS

	Sample ID										
	CCB - DPT61-15	CCB - DPT61-25	CCB - DPT61-35	CCB - DPT61-45	CCB - DPT61-55	CCB - DPT61-70	CCB - DPT62-15	CCB - DPT62-25	CCB - DPT62-35	CCB - DPT62-45	CCB - DPT62-55
Date of Analysis:	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06
Matrix:	Water										
Dilution Factor:	1	1	1	1	1	1	20	10	20	1	5
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
Chloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.7	<20	<10	<20	< 1.0	<5.0
Vinyl chloride	< 1.0	< 1.0	< 1.0	23.4	< 1.0	< 1.0	<20	27	240	57.3	24
Bromomethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
Chloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
Freon 113	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	830	<10	<20	< 1.0	5.3
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
Methylene Chloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
t-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
c-1,2-Dichloroethene	1.2	< 1.0	< 1.0	1.5	< 1.0	< 1.0	120	240	340	38.0	150
Chloroform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
Trichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	470	<10	170	2.3	18
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
Bromodichloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
c-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
t,1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
Tetrachloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
Dibromochloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
1,2-Dibromoethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
Chlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
Bromoform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
1,1,1,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
1,3-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
1,4-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
1,2-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
1,2-Dibromo-3-chloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0
1,2,4-Trichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<20	<10	<20	< 1.0	<5.0

Units for waters are ug/L and for soils are mg/Kg.

KB LABS, INC.

Final Data Report: NASA CCB III

October 24 to 27, 2006
Prepared for: Tetra Tech NUS

	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID
	CCB - DPT62-70	FDSA-MW0021S2	CCB - DPT63-15	CCB - DPT63-25	CCB - DPT63-35	CCB - DPT63-45	CCB - DPT63-55	CCB - DPT63-70	CCB - DPT64-15	CCB - DPT64-25	CCB - DPT64-35
Date of Analysis:	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06	10/25/06
Matrix:	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Dilution Factor:	10	20	1	1	1	1	1	1	1	5	1
Dichlorodifluoromethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
Chloromethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
Vinyl chloride	48	<20	1.5	6.5	1.4	< 1.0	< 1.0	< 1.0	1.3	<5.0	< 1.0
Bromomethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
Chloroethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
Trichlorofluoromethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
Freon 113	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
1,1-Dichloroethene	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
Methylene Chloride	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
t-1,2-Dichloroethene	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
1,1-Dichloroethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
c-1,2-Dichloroethene	480	590	25.3	20.1	18.2	10.5	7.8	3.2	6.7	130	5.3
Chloroform	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
1,1,1-Trichloroethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
Carbon Tetrachloride	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
1,2-Dichloroethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
Trichloroethene	13	<20	3.8	6.4	< 1.0	< 1.0	< 1.0	< 1.0	1.5	36	3.1
1,2-Dichloropropane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
Bromodichloromethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
c-1,3-Dichloropropene	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
t,1,3-Dichloropropene	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
1,1,2-Trichloroethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
Tetrachloroethene	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
Dibromochloromethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
1,2-Dibromoethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
Chlorobenzene	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
Bromoform	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
1,1,1,2-Tetrachloroethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
1,1,2,2-Tetrachloroethane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
1,3-Dichlorobenzene	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
1,4-Dichlorobenzene	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
1,2-Dichlorobenzene	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
1,2-Dibromo-3-chloropropane	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0
1,2,4-Trichlorobenzene	<10	<20	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5.0	< 1.0

Units for waters are ug/L and for soils are mg/Kg.

KB LABS, INC.

Final Data Report: NASA CCB III

October 24 to 27, 2006
Prepared for: Tetra Tech NUS

	Sample ID										
	CCB - DPT64-45	CCB - DPT64-55	CCB - DPT64-70	CCB - DPT65-15	CCB - DPT65-25	CCB - DPT65-35	CCB - DPT65-45	CCB - DPT65-55	CCB - DPT65-70	CCB - DPT67-15	CCB - DPT67-25
Date of Analysis:	10/26/06	10/26/06	10/26/06	10/26/06	10/26/06	10/26/06	10/26/06	10/26/06	10/26/06	10/27/06	10/27/06
Matrix:	Water										
Dilution Factor:	1	1	5	100	1	1	5	10	10	10	1
Dichlorodifluoromethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
Chloromethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
Vinyl chloride	1.2	< 1.0	<5.0	120	< 1.0	< 1.0	<5.0	<10	12	120	17.4
Bromomethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
Chloroethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
Trichlorofluoromethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
Freon 113	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
1,1-Dichloroethene	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
Methylene Chloride	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
t-1,2-Dichloroethene	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	1.9
1,1-Dichloroethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
c-1,2-Dichloroethene	46.6	22.7	110	2200	10.7	18.7	110	200	360	280	22.2
Chloroform	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
1,1,1-Trichloroethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
Carbon Tetrachloride	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
1,2-Dichloroethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
Trichloroethene	21.0	11.6	35	<100	1.1	< 1.0	<5.0	<10	11	<10	22.1
1,2-Dichloropropane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
Bromodichloromethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
c-1,3-Dichloropropene	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
t,1,3-Dichloropropene	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
1,1,2-Trichloroethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
Tetrachloroethene	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
Dibromochloromethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
1,2-Dibromoethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
Chlorobenzene	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
Bromoform	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
1,1,1,2-Tetrachloroethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
1,3-Dichlorobenzene	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
1,4-Dichlorobenzene	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
1,2-Dichlorobenzene	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
1,2-Dibromo-3-chloropropane	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0
1,2,4-Trichlorobenzene	< 1.0	< 1.0	<5.0	<100	< 1.0	< 1.0	<5.0	<10	<10	<10	<1.0

Units for waters are ug/L and for soils are mg/Kg.

KB LABS, INC.

Final Data Report: NASA CCB III

October 24 to 27, 2006
Prepared for: Tetra Tech NUS

	Sample ID										
	CCB - DPT67-35	CCB - DPT67-45	CCB - DPT67-55	CCB - DPT67-70	CCB - DPT50-15	CCB - DPT50-25	CCB - DPT50-35	CCB - DPT50-45	CCB - DPT50-55	CCB - DPT50-70	CCB - DPT49-15
Date of Analysis:	10/27/06	10/27/06	10/27/06	10/27/06	10/27/06	10/27/06	10/27/06	10/27/06	10/27/06	10/27/06	10/26/06
Matrix:	Water										
Dilution Factor:	1	1	1	1	1	500	1000	10	5	1000	1
Dichlorodifluoromethane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
Chloromethane	<1.0	< 1.0	< 1.0	1.5	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
Vinyl chloride	10.9	3.6	< 1.0	2.1	4.2	<500	<1000	140	6.4	<1000	< 1.0
Bromomethane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
Chloroethane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
Trichlorofluoromethane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
Freon 113	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
1,1-Dichloroethene	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
Methylene Chloride	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
t-1,2-Dichloroethene	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
1,1-Dichloroethane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
c-1,2-Dichloroethene	45.9	11.4	2.6	9.6	20.3	12,000	7400	220	260	2900	1.9
Chloroform	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
1,1,1-Trichloroethane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
Carbon Tetrachloride	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
1,2-Dichloroethane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
Trichloroethene	7.8	3.5	2.6	2.5	< 1.0	<500	8400	35	40	<1000	< 1.0
1,2-Dichloropropane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
Bromodichloromethane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
c-1,3-Dichloropropene	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000	< 1.0
t,1,3-Dichloropropene	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0
1,1,2-Trichloroethane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0
Tetrachloroethene	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0
Dibromochloromethane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0
1,2-Dibromoethane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0
Chlorobenzene	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0
Bromoform	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0
1,1,1,2-Tetrachloroethane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0
1,1,2,2-Tetrachloroethane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0
1,3-Dichlorobenzene	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0
1,4-Dichlorobenzene	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0
1,2-Dichlorobenzene	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0
1,2-Dibromo-3-chloropropane	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0
1,2,4-Trichlorobenzene	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	<500	<1000	<10	<5.0	<1000 J	< 1.0

Units for waters are ug/L and for soils are mg/Kg.

KB LABS, INC.

Final Data Report: NASA CCB III

October 24 to 27, 2006
Prepared for: Tetra Tech NUS

	Sample ID										
	CCB - DPT49-25	CCB - DPT49-35	CCB - DPT49-45	CCB - DPT49-55	CCB - DPT49-70	CCB - DPT36-15	CCB - DPT52-70	CCB - DPT43-70	CCB - DPT66-15	CCB - DPT66-25	CCB - DPT66-35
Date of Analysis:	10/26/06	10/26/06	10/26/06	10/26/06	10/26/06	10/26/06	10/26/06	10/26/06	10/26/06	10/26/06	10/27/06
Matrix:	Water										
Dilution Factor:	1	1	1	1	1	5000	40	1	500	1	100
Dichlorodifluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
Chloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
Vinyl chloride	< 1.0	8.0	39.9	< 1.0	2.4	<5000	68	1.1	<500	6.4	770
Bromomethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
Chloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
Trichlorofluoromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
Freon 113	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
1,1-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
Methylene Chloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
t-1,2-Dichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
1,1-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
c-1,2-Dichloroethene	1.1	< 1.0	3.8	< 1.0	< 1.0	<5000	1300	26.6	11,000	19.9	2300
Chloroform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
1,1,1-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
Carbon Tetrachloride	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
1,2-Dichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
Trichloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	190,000	310	9.1	680	4.1	<100
1,2-Dichloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
Bromodichloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
c-1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
t,1,3-Dichloropropene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
1,1,2-Trichloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
Tetrachloroethene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
Dibromochloromethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
1,2-Dibromoethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
Chlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
Bromoform	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
1,1,1,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
1,1,2,2-Tetrachloroethane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
1,3-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
1,4-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
1,2-Dichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
1,2-Dibromo-3-chloropropane	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100
1,2,4-Trichlorobenzene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<5000	<40	< 1.0	<500	<1.0	<100

Units for waters are ug/L and for soils are mg/Kg.

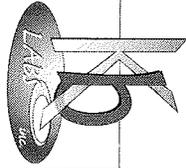
KB LABS, INC.

Final Data Report: NASA CCB III

October 24 to 27, 2006
Prepared for: Tetra Tech NUS

	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID	Sample ID
	CCB - DPT66-45	CCB - DPT66-55	CCB - DPT66-70							
Date of Analysis:	10/27/06	10/27/06	10/27/06							
Matrix:	Water	Water	Water							
Dilution Factor:	20	5	10							
Dichlorodifluoromethane	<20	<5.0	<10							
Chloromethane	<20	<5.0	<10							
Vinyl chloride	45	<5.0	<10							
Bromomethane	<20	<5.0	<10							
Chloroethane	<20	<5.0	<10							
Trichlorofluoromethane	<20	<5.0	<10							
Freon 113	<20	<5.0	<10							
1,1-Dichloroethene	<20	<5.0	<10							
Methylene Chloride	<20	<5.0	<10							
t-1,2-Dichloroethene	<20	<5.0	<10							
1,1-Dichloroethane	<20	<5.0	<10							
c-1,2-Dichloroethene	1300	130	160							
Chloroform	<20	<5.0	<10							
1,1,1-Trichloroethane	<20	<5.0	<10							
Carbon Tetrachloride	<20	<5.0	<10							
1,2-Dichloroethane	<20	<5.0	<10							
Trichloroethene	<20	7.6	<10							
1,2-Dichloropropane	<20	<5.0	<10							
Bromodichloromethane	<20	<5.0	<10							
c-1,3-Dichloropropene	<20	<5.0	<10							
t,1,3-Dichloropropene	<20	<5.0	<10							
1,1,2-Trichloroethane	<20	<5.0	<10							
Tetrachloroethene	<20	<5.0	<10							
Dibromochloromethane	<20	<5.0	<10							
1,2-Dibromoethane	<20	<5.0	<10							
Chlorobenzene	<20	<5.0	<10							
Bromoform	<20	<5.0	<10							
1,1,1,2-Tetrachloroethane	<20	<5.0	<10							
1,1,2,2-Tetrachloroethane	<20	<5.0	<10							
1,3-Dichlorobenzene	<20	<5.0	<10							
1,4-Dichlorobenzene	<20	<5.0	<10							
1,2-Dichlorobenzene	<20	<5.0	<10							
1,2-Dibromo-3-chloropropane	<20	<5.0	<10							
1,2,4-Trichlorobenzene	<20	<5.0	<10							

Units for waters are ug/L and for soils are mg/Kg.



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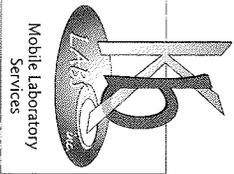
Mobile Laboratory
 Services

CHAIN-OF-CUSTODY RECORD

MOBILE UNIT #
 LAB-1

CLIENT NAME		PROJECT NAME & ADDRESS										
Eva Tech NUS		NASA COAST / NASA										
SAMPLERS		CONTACT PERSON					BATCH # (Lab Use Only)					
TT NUS		SCOTT McGuire										
SAMPLE FIELD ID \ NUMBER	DATE SAMPLED	TIME SAMPLED	COMP	GRAB	DATE RECD	TIME RECD	STATION LOCATION / No.	SAMPLE MATRIX	NUMBER OF CONTAINERS	IDENTIFY PARAMETERS DESIRED AND NO OF CONTAINERS	PRESERVATION	COMMENT
LAB-1 * 102406 *	10/23/10	1205		✓	10/24/10	0740		W	2			
DP-41 -45		1225										
DP-42 -45		1305										
DP-43 -45		1405										
DP-44 -45		1540										
DP-55		1605										
DP-55 -15	10/24/10	0810										
-25	0530	0830										
35	0855	0920										
55	0920	0920										
55	1050	1210										
70	1205	1210										
DP-58 -15	10/24/10	1210										
Prelabeled Containers Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time		Remarks and Observations				
Scott McGuire		10/23/10		Scott McGuire		10/23/10						

Matrix Types S Soil SW Surface Water GW Ground Water SG Soil Gas



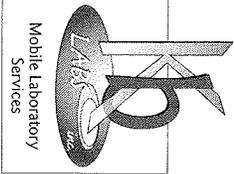
6821 SW Archer Road
 Gainesville, FL 32608
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 FAX (352) 367-0074

CHAIN-OF-CUSTODY RECORD

MOBILE UNIT #
 1KB-1

CLIENT NAME		PROJECT NAME & ADDRESS						SAMPLE MATRIX		IDENTIFY PARAMETERS DESIRED AND NO. OF CONTAINERS		PRESERVATION	
TetraTech Mus		Nasa CCBITI						VOLATILES		C Chilled H HCL O1 Other (see Remarks)		COMMENT	
SAMPLERS		CONTACT PERSON		DATE SAMPLED		TIME SAMPLED		DATE RECD		TIME RECD		STATION LOCATION / No.	
TT Mus		SCOTT											
SAMPLE FIELD ID \ NUMBER	DATE SAMPLED	TIME SAMPLED	COMP	GRAB	DATE RECD	TIME RECD	STATION LOCATION / No.		REMARKS AND OBSERVATIONS				
1KB1 * 102406A	10/24/06	1305			10/24/06	1410	W 2		✓				
DP552-25	10/24/06	1320											
35													
45		1345											
55		1410											
DP508-45	10/23/06	1735											
55		1800											
DP553-70	10/24/06	1440											
DP552-05		1520											
61 25		0540											
DP553-35		1605											
DP553-45		1625											
55		1650											
70		1715											
<p>Relinquished by: (Signature) <i>Scott McLean</i> Date / Time <i>10/24/06</i> Received by: (Signature) <i>Tom M... ..</i> Date / Time <i>10/24/06</i></p> <p>Relinquished by: (Signature) _____ Date / Time _____ Received by: (Signature) _____ Date / Time _____</p>													

Matrix Types S Soil SW Surface Water GW Ground Water SG Soil Gas



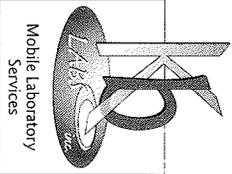
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MOBILE UNIT #
 1513-1

CHAIN-OF-CUSTODY RECORD

CLIENT NAME		PROJECT NAME & ADDRESS							BATCH # (Lab Use Only)			
TT Nias		NASA-CUBITE, Niasa										
SAMPLERS		CONTACT PERSON										
TT Nias		SCOTT										
SAMPLE FIELD ID \ NUMBER	DATE SAMPLED	TIME SAMPLED	COMP.	GRAB	DATE RECD	TIME RECD	STATION LOCATION / No.	SAMPLE MATRIX	NUMBER OF CONTAINERS	IDENTIFY PARAMETERS DESIRED AND NO OF CONTAINERS	PRESERVATION	COMMENT
4015102572	10/25/06	1630			10/25/06	1630		W	2	VOLATILES	C H O1 Chilled HCL Other (see Remarks)	
00164-35												
 [Remaining rows of the table are crossed out with a diagonal line.] 												
Pre-cleaned Containers Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time		Remarks and Observations				
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time						
Just R. McShane		10/25/06		[Signature]		10/25/06						

Matrix Types S Soil SW Surface Water GW Ground Water SG Soil Gas



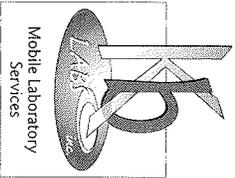
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CHAIN-OF-CUSTODY RECORD

MOBILE UNIT #
 K81

CLIENT NAME	PROJECT NAME & ADDRESS		CONTACT PERSON		BATCH # (Lab Use Only)		SAMPLE MATRIX	NUMBER OF CONTAINERS	IDENTIFY PARAMETERS DESIRED AND NO. OF CONTAINERS	PRESERVATION C Chilled H HCL Ot Other (see Remarks)	COMMENT
	SAMPLERS	DATE SAMPLED	TIME SAMPLED	COMP.	GRAB	DATE RECD					
TF Nus	NASA CCB III		SCOTT								
RTKus											
RB-1 #102606*	01/25/06	1655			10/24/06	0705					
DP-64-45		1725									
55		1800									
70		1900									
DP-65-15	10/25/06	1900									
25		1925									
35	10/26/06	0824				0530					
45		0905				0910					
55		1000				1000					
70		1045				1045					
DP-64-15		1135				1315					
25		1150									
35		1215									
45		1240									
55		1300									
70		1325				1325					
Reinforced Containers		Date / Time		Received by: (Signature)		Date / Time		Remarks and Observations			
Reinforced Containers		Date / Time		Received by: (Signature)		Date / Time					
Reinforced by: (Signature)		Date / Time		Received by: (Signature)		Date / Time					

Matrix Types S Soil SW Surface Water GW Ground Water SG Soil Gas



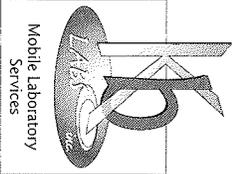
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CHAIN-OF-CUSTODY RECORD

MOBILE UNIT #
 KAB-1

CLIENT NAME		PROJECT NAME & ADDRESS						BATCH # (Lab Use Only)				
TT 1145		NASA CCB III										
SAMPLERS		CONTACT PERSON										
TT 1145		Scott McGuire										
SAMPLE FIELD ID \ NUMBER	DATE SAMPLED	TIME SAMPLED	COMP.	GRAB	DATE RECD	TIME RECD	STATION LOCATION / No.	SAMPLE MATRIX	NUMBER OF CONTAINERS	IDENTIFY PARAMETERS DESIRED AND NO OF CONTAINERS	PRESERVATION	COMMENT
K01-102702*												
DP166-35	10/26/08	1805			10/27/08	0915		W 2	2	VOLATILES		
45		1830										
55		1900										
70		1930										
DP167-15	10/27/08	0825				0855						
85		0845										
35		0915				0915						
45		0940				0945						
55		1010				1010						
70		1040										
DP150-15		1120				1120						
85		1140				1145						
35		1200				1210						
45		1225				1230						
55		1245				1255						
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time		Remarks and Observations				
Scott E McGuire		10/26/08		Scott McGuire		10/27/08						

Matrix Types S Soil SW Surface Water GW Ground Water SG Soil Gas



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CHAIN-OF-CUSTODY RECORD

MOBILE UNIT #

K8-1

CLIENT NAME		PROJECT NAME & ADDRESS						SAMPLE MATRIX		NUMBER OF CONTAINERS		IDENTIFY PARAMETERS DESIRED AND NO. OF CONTAINERS		PRESERVATION	
TT NURS		NASA CCRB III						VOLATILES				Chilled HCL Other (see Remarks)			
SAMPLERS		CONTACT PERSON						VARIABLES				C H O			
TT NURS		SCOTT						COMMIT							
SAMPLE FIELD ID \ NUMBER	DATE SAMPLED	TIME SAMPLED	COMP.	GRAB	DATE RECD	TIME RECD	STATION LOCATION / No.								
LAB-102602*	10/26/02	1415			10/26/02	1420		220							
DP-36-15		1455			10/26/02	1500									
DP-43-70		1635			10/26/02	1635									
DP-66-15		1720			10/26/02	1720									
25		1740			10/26/02	1740									
<div style="border: 1px solid black; width: 100%; height: 100%; transform: rotate(45deg); opacity: 0.5;"></div>															
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Date / Time		Remarks and Observations							
Scott R. McGraw		10/26/02		[Signature]		10/26/02									

Matrix Types S Soil SW Surface Water GW Ground Water SG Soil Gas

SVOA

The acid surrogates for the method blank associated with batch WG33135 had acid surrogate recoveries less than five percent. No action was taken on this basis because the associated samples had compliant surrogate recoveries

Pesticides

No qualification of the data was necessary.

PCBs

No qualification of the data was necessary.

Herbicides

The surrogate 2,4-dichlorophenylacetic acid had percent recoveries less than 10% on both columns for samples 03SW1101 and 03SW1401. The samples were re-extracted with compliant surrogate recoveries. Sample 03SW1101 was extracted within the extraction hold time and sample 03SW1401 was re-extracted two days outside of the 7 day extraction hold time. The re-extracted results are considered the valid results for both samples. No qualification action was taken on sample 03SW1101. The non-detected results for sample 03SW1401 have been qualified as estimated (UJ).

Notes

Positive results reported below the quantitation limit but above the method detection limit were qualified as estimated, J.

Executive Summary

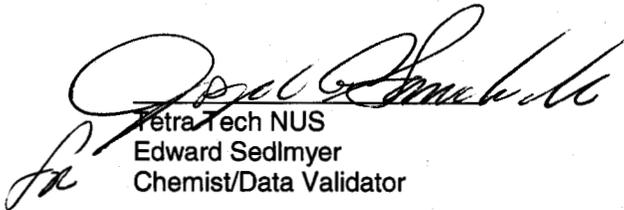
Laboratory Performance: Two samples analyzed for herbicide fraction had surrogate recoveries less than 10%. The samples were extracted. One of the herbicides was extracted outside of holding time resulting in estimation of data.

Other Factors Affecting Data Quality: None.

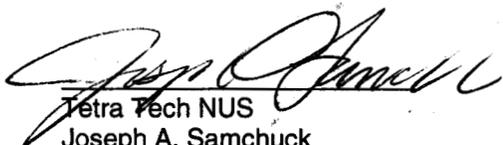
The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DoD Guidelines and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS
Edward Sedlmyer
Chemist/Data Validator



Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Data Validation Qualifier Codes:

- A = Lab Blank Contamination
- B = Field Blank Contamination
- C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
- C01 = GC/MS Tuning Noncompliance
- D = MS/MSD Recovery Noncompliance
- E = LCS/LCSD Recovery Noncompliance
- F = Lab Duplicate Imprecision
- G = Field Duplicate Imprecision
- H = Holding Time Exceedance
- I = ICP Serial Dilution Noncompliance
- J = GFAA PDS - GFAA MSA's $r < 0.995$ / ICP PDS Recovery Noncompliance
- K = ICP Interference - includes ICS % R Noncompliance
- L = Instrument Calibration Range Exceedance
- M = Sample Preservation Noncompliance
- N = Internal Standard Noncompliance
- N01 = Internal Standard Recovery Noncompliance Dioxins
- N02 = Recovery Standard Noncompliance Dioxins
- N03 = Clean-up Standard Noncompliance Dioxins
- O = Poor Instrument Performance (e.g. base-line drifting)
- P = Uncertainty near detection limit ($< 2 \times$ IDL for inorganics and $<$ CRQL for organics)
- Q = Other problems (can encompass a number of issues; e.g. chromatography, interferences, etc.)
- R = Surrogates Recovery Noncompliance
- S = Pesticide/PCB Resolution
- T = % Breakdown Noncompliance for DDT and Endrin
- U = % Difference between columns/detectors $>25\%$ for positive results determined via GC/HPLC
- V = Non-linear calibrations; correlation coefficient $r < 0.995$
- W = EMPC result
- X = Signal to noise response drop
- Y = Percent solids $<30\%$
- Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OV

nsample 03SW0101
 samp_date 10/12/2006
 lab_id WW5477-5
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0101
 samp_date 10/12/2006
 lab_id WW5477-5
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0201
 samp_date 10/12/2006
 lab_id WW5477-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	5	U	
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	5	U	
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OV

nsample 03SW0201
 samp_date 10/12/2006
 lab_id WW5477-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0301
 samp_date 10/12/2006
 lab_id WW5477-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0301
 samp_date 10/12/2006
 lab_id WW5477-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	5	U	
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OV

nsample 03SW0401
 samp_date 10/12/2006
 lab_id WW5477-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0401
 samp_date 10/12/2006
 lab_id WW5477-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0501
 samp_date 10/12/2006
 lab_id WW5477-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	5	U	
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	5	U	
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OV

nsample 03SW0501
 samp_date 10/12/2006
 lab_id WW5477-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0601
 samp_date 10/13/2006
 lab_id WW5513-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0601
 samp_date 10/13/2006
 lab_id WW5513-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	5	U	
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OV

nsample 03SW0601D
 samp_date 10/13/2006
 lab_id WW5513-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF: 03SW0601

nsample 03SW0601D
 samp_date 10/13/2006
 lab_id WW5513-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF: 03SW0601

nsample 03SW0701
 samp_date 10/13/2006
 lab_id WW5513-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	5	U	
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	5	U	
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OV

nsample 03SW0701
 samp_date 10/13/2006
 lab_id WW5513-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1001
 samp_date 10/13/2006
 lab_id WW5513-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1001
 samp_date 10/13/2006
 lab_id WW5513-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	5		
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OV

nsample 03SW1101
 samp_date 10/17/2006
 lab_id WW5571-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1101
 samp_date 10/17/2006
 lab_id WW5571-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1201
 samp_date 10/17/2006
 lab_id WW5571-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	8		
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	0.9	J	P
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	8		
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OV

nsample 03SW1201
 samp_date 10/17/2006
 lab_id WW5571-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1301
 samp_date 10/15/2006
 lab_id WW5535-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1301
 samp_date 10/15/2006
 lab_id WW5535-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	0.9	J	P
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROENZENE	5	U	
1,4-DICHLOROENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	5	U	
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OV

nsample 03SW1401
 samp_date 10/15/2006
 lab_id WW5535-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1401
 samp_date 10/15/2006
 lab_id WW5535-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1501
 samp_date 10/15/2006
 lab_id WW5535-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	5	U	
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	4	J	P
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OV

nsample 03SW1501
 samp_date 10/15/2006
 lab_id WW5535-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1601
 samp_date 10/15/2006
 lab_id WW5535-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1601
 samp_date 10/15/2006
 lab_id WW5535-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	5	U	
2-HEXANONE	5	U	
4-METHYL-2-PENTANONE	5	U	
ACETONE	5	U	
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	15	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW0101
 samp_date 10/12/2006
 lab_id WW5477-5
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0101
 samp_date 10/12/2006
 lab_id WW5477-5
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0101
 samp_date 10/12/2006
 lab_id WW5477-5
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	10	U	
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLOROBENZENE	10	U	
HEXACHLOROBUTADIENE	10	U	
HEXACHLOROCYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW0201
 samp_date 10/12/2006
 lab_id WW5477-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0201
 samp_date 10/12/2006
 lab_id WW5477-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0201
 samp_date 10/12/2006
 lab_id WW5477-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	10	U	
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLOROBENZENE	10	U	
HEXACHLOROBUTADIENE	10	U	
HEXACHLOROCYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW0301
 samp_date 10/12/2006
 lab_id WW5477-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0301
 samp_date 10/12/2006
 lab_id WW5477-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0301
 samp_date 10/12/2006
 lab_id WW5477-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	10	U	
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLOROENZENE	10	U	
HEXACHLOROBUTADIENE	10	U	
HEXACHLOROCYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW0401
 samp_date 10/12/2006
 lab_id WW5477-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0401
 samp_date 10/12/2006
 lab_id WW5477-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0401
 samp_date 10/12/2006
 lab_id WW5477-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	10	U	
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLOROBENZENE	10	U	
HEXACHLOROBUTADIENE	10	U	
HEXACHLOROCYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW0501
 samp_date 10/12/2006
 lab_id WW5477-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0501
 samp_date 10/12/2006
 lab_id WW5477-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0501
 samp_date 10/12/2006
 lab_id WW5477-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	10	U	
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLOROBENZENE	10	U	
HEXACHLOROBUTADIENE	10	U	
HEXACHLOROCYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW0601
 samp_date 10/13/2006
 lab_id WW5513-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0601
 samp_date 10/13/2006
 lab_id WW5513-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0601
 samp_date 10/13/2006
 lab_id WW5513-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	10	U	
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLOROBENZENE	10	U	
HEXACHLOROBUTADIENE	10	U	
HEXACHLOROCYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW0601D
 samp_date 10/13/2006
 lab_id WW5513-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF: 03SW0601

nsample 03SW0601D
 samp_date 10/13/2006
 lab_id WW5513-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF: 03SW0601

nsample 03SW0601D
 samp_date 10/13/2006
 lab_id WW5513-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF: 03SW0601

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	10	U	
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLOROBENZENE	10	U	
HEXACHLOROBUTADIENE	10	U	
HEXACHLOROCYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW0701
 samp_date 10/13/2006
 lab_id WW5513-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0701
 samp_date 10/13/2006
 lab_id WW5513-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0701
 samp_date 10/13/2006
 lab_id WW5513-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	10	U	
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLOROENZENE	10	U	
HEXACHLOROBUTADIENE	10	U	
HEXACHLOROCYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW1001
 samp_date 10/13/2006
 lab_id WW5513-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1001
 samp_date 10/13/2006
 lab_id WW5513-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1001
 samp_date 10/13/2006
 lab_id WW5513-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	10	U	
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLORO BENZENE	10	U	
HEXACHLORO BUTADIENE	10	U	
HEXACHLOROCYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW1101
 samp_date 10/17/2006
 lab_id WW5571-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1101
 samp_date 10/17/2006
 lab_id WW5571-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1101
 samp_date 10/17/2006
 lab_id WW5571-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	11		
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLORO BENZENE	10	U	
HEXACHLORO BUTADIENE	10	U	
HEXACHLORO CYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW1201
 samp_date 10/17/2006
 lab_id WW5571-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1201
 samp_date 10/17/2006
 lab_id WW5571-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1201
 samp_date 10/17/2006
 lab_id WW5571-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	11	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	11	U	
2,4,5-TRICHLOROPHENOL	29	U	
2,4,6-TRICHLOROPHENOL	11	U	
2,4-DICHLOROPHENOL	11	U	
2,4-DIMETHYLPHENOL	11	U	
2,4-DINITROPHENOL	29	U	
2,4-DINITROTOLUENE	11	U	
2,6-DINITROTOLUENE	11	U	
2-CHLORONAPHTHALENE	11	U	
2-CHLOROPHENOL	11	U	
2-METHYLNAPHTHALENE	11	U	
2-METHYLPHENOL	11	U	
2-NITROANILINE	29	U	
2-NITROPHENOL	11	U	
3&4-METHYLPHENOL	11	U	
3,3'-DICHLOROBENZIDINE	11	U	
3-NITROANILINE	29	U	
4,6-DINITRO-2-METHYLPHENOL	29	U	
4-BROMOPHENYL PHENYL ETHER	11	U	
4-CHLORO-3-METHYLPHENOL	11	U	
4-CHLOROANILINE	11	U	
4-CHLOROPHENYL PHENYL ETHER	11	U	
4-NITROANILINE	29	U	
4-NITROPHENOL	29	U	
ACENAPHTHENE	11	U	
ACENAPHTHYLENE	11	U	
ACETOPHENONE	11	U	
ANTHRACENE	11	U	
ATRAZINE	11	U	
BENZALDEHYDE	11	U	
BENZO(A)ANTHRACENE	11	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	11	U	
BENZO(B)FLUORANTHENE	11	U	
BENZO(G,H,I)PERYLENE	11	U	
BENZO(K)FLUORANTHENE	11	U	
BIS(2-CHLOROETHOXY)METHANE	11	U	
BIS(2-CHLOROETHYL)ETHER	11	U	
BIS(2-ETHYLHEXYL)PHTHALATE	11	U	
BUTYL BENZYL PHTHALATE	11	U	
CAPROLACTAM	11	U	
CARBAZOLE	11	U	
CHRYSENE	11	U	
DIBENZO(A,H)ANTHRACENE	11	U	
DIBENZOFURAN	11	U	
DIETHYL PHTHALATE	11	U	
DIMETHYL PHTHALATE	11	U	
DI-N-BUTYL PHTHALATE	11	U	
DI-N-OCTYL PHTHALATE	11	U	
FLUORANTHENE	11	U	
FLUORENE	11	U	
HEXACHLOROBENZENE	11	U	
HEXACHLOROBUTADIENE	11	U	
HEXACHLOROCYCLOPENTADIENE	11	U	
HEXACHLOROETHANE	11	U	
INDENO(1,2,3-CD)PYRENE	11	U	
ISOPHORONE	11	U	
NAPHTHALENE	11	U	
NITROBENZENE	11	U	
N-NITROSO-DI-N-PROPYLAMINE	11	U	
N-NITROSODIPHENYLAMINE	11	U	
PENTACHLOROPHENOL	29	U	
PHENANTHRENE	11	U	
PHENOL	11	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	11	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW1301
 samp_date 10/15/2006
 lab_id WW5535-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1301
 samp_date 10/15/2006
 lab_id WW5535-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1301
 samp_date 10/15/2006
 lab_id WW5535-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	10	U	
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLOROENZENE	10	U	
HEXACHLOROBUTADIENE	10	U	
HEXACHLOROCYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW1401
 samp_date 10/15/2006
 lab_id WW5535-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1401
 samp_date 10/15/2006
 lab_id WW5535-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1401
 samp_date 10/15/2006
 lab_id WW5535-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	10	U	
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLOROBENZENE	10	U	
HEXACHLOROBUTADIENE	10	U	
HEXACHLOROCYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW1501
 samp_date 10/15/2006
 lab_id WW5535-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1501
 samp_date 10/15/2006
 lab_id WW5535-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1501
 samp_date 10/15/2006
 lab_id WW5535-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	19		
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLORO BENZENE	10	U	
HEXACHLOROBUTADIENE	10	U	
HEXACHLOROCYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: OS

nsample 03SW1601
 samp_date 10/15/2006
 lab_id WW5535-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1601
 samp_date 10/15/2006
 lab_id WW5535-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1601
 samp_date 10/15/2006
 lab_id WW5535-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	10	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	10	U	
2,4,5-TRICHLOROPHENOL	25	U	
2,4,6-TRICHLOROPHENOL	10	U	
2,4-DICHLOROPHENOL	10	U	
2,4-DIMETHYLPHENOL	10	U	
2,4-DINITROPHENOL	25	U	
2,4-DINITROTOLUENE	10	U	
2,6-DINITROTOLUENE	10	U	
2-CHLORONAPHTHALENE	10	U	
2-CHLOROPHENOL	10	U	
2-METHYLNAPHTHALENE	10	U	
2-METHYLPHENOL	10	U	
2-NITROANILINE	25	U	
2-NITROPHENOL	10	U	
3&4-METHYLPHENOL	10	U	
3,3'-DICHLOROBENZIDINE	10	U	
3-NITROANILINE	25	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	10	U	
4-CHLORO-3-METHYLPHENOL	10	U	
4-CHLOROANILINE	10	U	
4-CHLOROPHENYL PHENYL ETHER	10	U	
4-NITROANILINE	25	U	
4-NITROPHENOL	25	U	
ACENAPHTHENE	10	U	
ACENAPHTHYLENE	10	U	
ACETOPHENONE	10	U	
ANTHRACENE	10	U	
ATRAZINE	10	U	
BENZALDEHYDE	10	U	
BENZO(A)ANTHRACENE	10	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	10	U	
BENZO(B)FLUORANTHENE	10	U	
BENZO(G,H,I)PERYLENE	10	U	
BENZO(K)FLUORANTHENE	10	U	
BIS(2-CHLOROETHOXY)METHANE	10	U	
BIS(2-CHLOROETHYL)ETHER	10	U	
BIS(2-ETHYLHEXYL)PHTHALATE	10	U	
BUTYL BENZYL PHTHALATE	10	U	
CAPROLACTAM	10	U	
CARBAZOLE	10	U	
CHRYSENE	10	U	
DIBENZO(A,H)ANTHRACENE	10	U	
DIBENZOFURAN	10	U	
DIETHYL PHTHALATE	10	U	
DIMETHYL PHTHALATE	10	U	
DI-N-BUTYL PHTHALATE	10	U	
DI-N-OCTYL PHTHALATE	10	U	
FLUORANTHENE	10	U	
FLUORENE	10	U	
HEXACHLOROBENZENE	10	U	
HEXACHLOROBUTADIENE	10	U	
HEXACHLOROCYCLOPENTADIENE	10	U	
HEXACHLOROETHANE	10	U	
INDENO(1,2,3-CD)PYRENE	10	U	
ISOPHORONE	10	U	
NAPHTHALENE	10	U	
NITROBENZENE	10	U	
N-NITROSO-DI-N-PROPYLAMINE	10	U	
N-NITROSODIPHENYLAMINE	10	U	
PENTACHLOROPHENOL	25	U	
PHENANTHRENE	10	U	
PHENOL	10	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	10	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: PEST/PCB

nsample 03SW0101
 samp_date 10/12/2006
 lab_id WW5477-5
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0201
 samp_date 10/12/2006
 lab_id WW5477-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0301
 samp_date 10/12/2006
 lab_id WW5477-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: PEST/PCB

nsample 03SW0401
 samp_date 10/12/2006
 lab_id WW5477-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0501
 samp_date 10/12/2006
 lab_id WW5477-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0601
 samp_date 10/13/2006
 lab_id WW5513-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: PEST/PCB

nsample 03SW0601D
 samp_date 10/13/2006
 lab_id WW5513-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF: 03SW0601

nsample 03SW0701
 samp_date 10/13/2006
 lab_id WW5513-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1001
 samp_date 10/13/2006
 lab_id WW5513-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: PEST/PCB

nsample 03SW1101
 samp_date 10/17/2006
 lab_id WW5571-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1201
 samp_date 10/17/2006
 lab_id WW5571-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1301
 samp_date 10/15/2006
 lab_id WW5535-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: PEST/PCB

nsample 03SW1401
 samp_date 10/15/2006
 lab_id WW5535-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1501
 samp_date 10/15/2006
 lab_id WW5535-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1601
 samp_date 10/15/2006
 lab_id WW5535-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.1	U	
4,4'-DDE	0.1	U	
4,4'-DDT	0.1	U	
ALDRIN	0.05	U	
ALPHA-BHC	0.05	U	
ALPHA-CHLORDANE	0.05	U	
AROCLOR-1016	0.5	U	
AROCLOR-1221	0.5	U	
AROCLOR-1232	0.5	U	
AROCLOR-1242	0.5	U	
AROCLOR-1248	0.5	U	
AROCLOR-1254	0.5	U	
AROCLOR-1260	0.5	U	
BETA-BHC	0.05	U	
DELTA-BHC	0.05	U	
DIELDRIN	0.1	U	
ENDOSULFAN I	0.05	U	
ENDOSULFAN II	0.1	U	
ENDOSULFAN SULFATE	0.1	U	
ENDRIN	0.1	U	
ENDRIN ALDEHYDE	0.1	U	
ENDRIN KETONE	0.1	U	
GAMMA-BHC (LINDANE)	0.05	U	
GAMMA-CHLORDANE	0.05	U	
HEPTACHLOR	0.05	U	
HEPTACHLOR EPOXIDE	0.05	U	
METHOXYCHLOR	0.5	U	
TOXAPHENE	1	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: HERB

nsample 03SW0101
 samp_date 10/12/2006
 lab_id WW5477-5
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0201
 samp_date 10/12/2006
 lab_id WW5477-4
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0301
 samp_date 10/12/2006
 lab_id WW5477-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3	U	
2,4,5-TP (SILVEX)	3	U	
2,4-D	3	U	
2,4-DB	3	U	
DALAPON	5	U	
DICAMBA	3	U	
DICHLOROPROP	3	U	
DINOSEB	5	U	
MCPA	150	U	
MCPP	100	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3	U	
2,4,5-TP (SILVEX)	3	U	
2,4-D	3	U	
2,4-DB	3	U	
DALAPON	5	U	
DICAMBA	3	U	
DICHLOROPROP	3	U	
DINOSEB	5	U	
MCPA	150	U	
MCPP	100	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3	U	
2,4,5-TP (SILVEX)	3	U	
2,4-D	3	U	
2,4-DB	3	U	
DALAPON	5	U	
DICAMBA	3	U	
DICHLOROPROP	3	U	
DINOSEB	5	U	
MCPA	150	U	
MCPP	100	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: HERB

nsample 03SW0401
 samp_date 10/12/2006
 lab_id WW5477-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0501
 samp_date 10/12/2006
 lab_id WW5477-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0601
 samp_date 10/13/2006
 lab_id WW5513-1
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3.1	U	
2,4,5-TP (SILVEX)	3.1	U	
2,4-D	3.1	U	
2,4-DB	3.1	U	
DALAPON	5.1	U	
DICAMBA	3.1	U	
DICHLOROPROP	3.1	U	
DINOSEB	5.1	U	
MCPA	150	U	
MCPP	100	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3	U	
2,4,5-TP (SILVEX)	3	U	
2,4-D	3	U	
2,4-DB	3	U	
DALAPON	5	U	
DICAMBA	3	U	
DICHLOROPROP	3	U	
DINOSEB	5	U	
MCPA	150	U	
MCPP	100	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3	U	
2,4,5-TP (SILVEX)	3	U	
2,4-D	3	U	
2,4-DB	3	U	
DALAPON	5	U	
DICAMBA	3	U	
DICHLOROPROP	3	U	
DINOSEB	5	U	
MCPA	150	U	
MCPP	100	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: HERB

nsample 03SW0601D
 samp_date 10/13/2006
 lab_id WW5513-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF: 03SW0601

nsample 03SW0701
 samp_date 10/13/2006
 lab_id WW5513-3
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1101RE
 samp_date 10/17/2006
 lab_id WW5571-1RE
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3	U	
2,4,5-TP (SILVEX)	3	U	
2,4-D	3	U	
2,4-DB	3	U	
DALAPON	5	U	
DICAMBA	3	U	
DICHLOROPROP	3	U	
DINOSEB	5	U	
MCPA	150	U	
MCPP	100	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3	U	
2,4,5-TP (SILVEX)	3	U	
2,4-D	3	U	
2,4-DB	3	U	
DALAPON	5	U	
DICAMBA	3	U	
DICHLOROPROP	3	U	
DINOSEB	5	U	
MCPA	150	U	
MCPP	100	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3	U	
2,4,5-TP (SILVEX)	3	U	
2,4-D	3	U	
2,4-DB	3	U	
DALAPON	5	U	
DICAMBA	3	U	
DICHLOROPROP	3	U	
DINOSEB	5	U	
MCPA	150	U	
MCPP	100	U	

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: HERB

nsample 03SW1201
 samp_date 10/17/2006
 lab_id WW5571-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1301
 samp_date 10/15/2006
 lab_id WW5535-2
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1401RE
 samp_date 10/15/2006
 lab_id WW5535-1RE
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3	U	
2,4,5-TP (SILVEX)	3	U	
2,4-D	3	U	
2,4-DB	3	U	
DALAPON	5	U	
DICAMBA	3	U	
DICHLOROPROP	3	U	
DINOSEB	5	U	
MCPA	150	U	
MCPP	100	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3	U	
2,4,5-TP (SILVEX)	3	U	
2,4-D	3	U	
2,4-DB	3	U	
DALAPON	5	U	
DICAMBA	3	U	
DICHLOROPROP	3	U	
DINOSEB	5	U	
MCPA	150	U	
MCPP	100	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3	UJ	H
2,4,5-TP (SILVEX)	3	UJ	H
2,4-D	3	UJ	H
2,4-DB	3	UJ	H
DALAPON	5	UJ	H
DICAMBA	3	UJ	H
DICHLOROPROP	3	UJ	H
DINOSEB	5	UJ	H
MCPA	150	UJ	H
MCPP	100	UJ	H

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: HERB

nsample 03SW1501
samp_date 10/15/2006
lab_id WW5535-4
qc_type NM
units UG/L
Pct_Solids 0.0
DUP_OF:

nsample 03SW1601
samp_date 10/15/2006
lab_id WW5535-3
qc_type NM
units UG/L
Pct_Solids 0.0
DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3	U	
2,4,5-TP (SILVEX)	3	U	
2,4-D	3	U	
2,4-DB	3	U	
DALAPON	5	U	
DICAMBA	3	U	
DICHLOROPROP	3	U	
DINOSEB	5	U	
MCPA	150	U	
MCPP	100	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	3	U	
2,4,5-TP (SILVEX)	3	U	
2,4-D	3	U	
2,4-DB	3	U	
DALAPON	5	U	
DICAMBA	3	U	
DICHLOROPROP	3	U	
DINOSEB	5	U	
MCPA	150	U	
MCPP	100	U	



Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: R. Fisher **DATE:** DECEMBER 1, 2006
FROM: MATTHEW D. KRAUS **COPIES:** DV FILE
SUBJECT: INORGANIC DATA VALIDATION – TAL METALS
NCBC GULFPORT – CTO 041
SAMPLE DELIVERY GROUP (SDG) – CTO041-1

SAMPLES: 15/Aqueous/

03SW0101	03SW0201	03SW0301
03SW0401	03SW0501	03SW0601
03SW0601D	03SW0701	03SW1001
03SW1101	03SW1201	03SW1301
03SW1401	03SW1501	03SW1601

Overview

The sample set for NCBC GULFPORT, CTO 041, SDG CTO041-1, consists of fifteen aqueous environmental samples. One field duplicate pair (03SW0601 / 03SW0601D) is included in this SDG.

All samples were analyzed for target analyte list (TAL) metals. The samples were collected by Tetra Tech NUS on October 12-13, 15-16, 2006 and analyzed by Katahdin Analytical Services. TAL analyses (except mercury) were conducted using SW-846 6010B. Mercury analyses were conducted using SW-846 7470A.

Tal analyses were conducted using Inductively Coupled Plasma Atomic Absorption (ICP) methodologies and mercury analyses were conducted using Cold Vapor Atomic Absorption (CVAA) methodologies.

These data were evaluated based on the following parameters:

- * • Data Completeness
 - * • Holding Times
 - * • Calibration Analyses
 - Laboratory Blank Analyses
 - * • Field Duplicate Precision
 - * • Detection Limits
- * - All quality control criteria were met for this parameter.

TO: FISHER, R – PAGE 2
DATE: DECEMBER 1, 2006

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentration:

<u>Analyte</u>	<u>Maximum Concentration (ug/L)</u>	<u>Action Level (ug/L)</u>
Aluminum	85.46	427
Antimony	4.19	21.0
Arsenic	4.57	22.8
Beryllium	0.40	2.00
Cadmium	4.21	21.0
Calcium	53.53	268
Chromium	1.11	5.55
Iron	26.42	132
Magnesium	69.73	349
Manganese	0.53	2.65
Nickel	11.28	56.4
Potassium	883.36	4417
Silver	6.83	34.2
Sodium	264.72	1324
Thallium ⁽¹⁾	8.870	44.4

⁽¹⁾ Maximum concentration is present in the laboratory preparation blank.

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors, if applicable, were taken into consideration when evaluating for blank contamination. Positive results for aluminum, antimony, arsenic, cadmium, chromium, iron, nickel, potassium, silver, and thallium less than the blank action level were qualified due to blank contamination.

Executive Summary

Laboratory Performance: Aluminum, antimony, arsenic, cadmium, chromium, iron, nickel, potassium, silver, and thallium were qualified due to blank contamination.

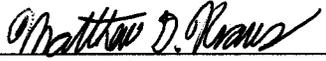
Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", October 2004 and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006).

The text of this report has been formulated to address only those problem areas affecting data quality.

TO: FISHER, R – PAGE 3
DATE: DECEMBER 1, 2006

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DoD QSM and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS
Matthew D. Kraus
Chemist / Environmental Scientist



Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: M

nsample 03SW0101
 samp_date 10/12/2006
 lab_id WW5477-005
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0201
 samp_date 10/12/2006
 lab_id WW5477-004
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0301
 samp_date 10/12/2006
 lab_id WW5477-003
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINIUM	87.8	U	A
ANTIMONY	3.2	U	A
ARSENIC	3.09	U	
BARIUM	31.5		
BERYLLIUM	0.3	U	
CADMIUM	2.48	U	
CALCIUM	20600		
CHROMIUM	0.69	U	
COBALT	2.99	U	
COPPER	3.19	U	
IRON	2860		
LEAD	1.8	U	
MAGNESIUM	2740		
MANGANESE	73.3		
MERCURY	0.01	U	
NICKEL	9.98	U	
POTASSIUM	2450	U	A
SELENIUM	4.04	U	
SILVER	4.23	U	
SODIUM	13900		
THALLIUM	9	U	A
VANADIUM	5.89	U	
ZINC	5.8		

Parameter	Result	Val Qual	Qual Code
ALUMINIUM	67.3	U	A
ANTIMONY	2.68	U	
ARSENIC	3.09	U	
BARIUM	30.5		
BERYLLIUM	0.3	U	
CADMIUM	2.48	U	
CALCIUM	21400		
CHROMIUM	0.8	U	A
COBALT	2.99	U	
COPPER	3.19	U	
IRON	2850		
LEAD	1.8	U	
MAGNESIUM	2800		
MANGANESE	42		
MERCURY	0.01	U	
NICKEL	9.98	U	
POTASSIUM	1570	U	A
SELENIUM	4.04	U	
SILVER	4.23	U	
SODIUM	13700		
THALLIUM	7	U	A
VANADIUM	5.89	U	
ZINC	3.22	U	

Parameter	Result	Val Qual	Qual Code
ALUMINIUM	389	U	A
ANTIMONY	2.68	U	
ARSENIC	3.09	U	
BARIUM	38		
BERYLLIUM	0.3	U	
CADMIUM	2.7	U	A
CALCIUM	18100		
CHROMIUM	0.95	U	A
COBALT	2.99	U	
COPPER	13		
IRON	2940		
LEAD	1.9		
MAGNESIUM	2810		
MANGANESE	98.2		
MERCURY	0.01	U	
NICKEL	9.98	U	
POTASSIUM	1850	U	A
SELENIUM	4.04	U	
SILVER	4.23	U	
SODIUM	15100		
THALLIUM	7.5	U	A
VANADIUM	5.89	U	
ZINC	13.4		

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: M

nsample 03SW0401
 samp_date 10/12/2006
 lab_id WW5477-002
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0501
 samp_date 10/12/2006
 lab_id WW5477-001
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW0601
 samp_date 10/13/2006
 lab_id WW5513-001
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	54.2	U	A
ANTIMONY	2.68	U	
ARSENIC	12.7	U	A
BARIUM	35.9		
BERYLLIUM	0.3	U	
CADMIUM	4.4	U	A
CALCIUM	20700		
CHROMIUM	1.1	U	A
COBALT	2.99	U	
COPPER	3.19	U	
IRON	3580		
LEAD	1.8	U	
MAGNESIUM	4150		
MANGANESE	45.5		
MERCURY	0.01	U	
NICKEL	10.4	U	A
POTASSIUM	2380	U	A
SELENIUM	4.04	U	
SILVER	4.23	U	
SODIUM	13600		
THALLIUM	6.04	U	
VANADIUM	5.89	U	
ZINC	5.7		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	37.8	U	A
ANTIMONY	4.2	U	A
ARSENIC	12.1	U	A
BARIUM	34.1		
BERYLLIUM	0.3	U	
CADMIUM	2.9	U	A
CALCIUM	22000		
CHROMIUM	0.69	U	
COBALT	2.99	U	
COPPER	3.19	U	
IRON	3680		
LEAD	1.8	U	
MAGNESIUM	3990		
MANGANESE	42.7		
MERCURY	0.01	U	
NICKEL	9.98	U	
POTASSIUM	1900	U	A
SELENIUM	4.04	U	
SILVER	4.23	U	
SODIUM	13400		
THALLIUM	6.6	U	A
VANADIUM	5.89	U	
ZINC	3.4		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	398	U	A
ANTIMONY	3.3	U	A
ARSENIC	3.09	U	
BARIUM	4.2		
BERYLLIUM	0.3	U	
CADMIUM	2.48	U	
CALCIUM	2760		
CHROMIUM	1.7	U	A
COBALT	2.99	U	
COPPER	3.19	U	
IRON	316		
LEAD	1.8	U	
MAGNESIUM	1760		
MANGANESE	9		
MERCURY	0.01	U	
NICKEL	9.98	U	
POTASSIUM	5590		
SELENIUM	4.04	U	
SILVER	4.23	U	
SODIUM	21600		
THALLIUM	6.2	U	A
VANADIUM	5.89	U	
ZINC	7		

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: M

nsample 03SW0601D
 samp_date 10/13/2006
 lab_id WW5513-002
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF: 03SW0601

nsample 03SW0701
 samp_date 10/13/2006
 lab_id WW5513-003
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1001
 samp_date 10/13/2006
 lab_id WW5513-004
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	57	U	A
ANTIMONY	2.68	U	
ARSENIC	3.09	U	
BARIUM	3.7		
BERYLLIUM	0.3	U	
CADMIUM	2.48	U	
CALCIUM	2730		
CHROMIUM	0.69	U	
COBALT	2.99	U	
COPPER	3.19	U	
IRON	135		
LEAD	1.8	U	
MAGNESIUM	1760		
MANGANESE	8		
MERCURY	0.01	U	
NICKEL	9.98	U	
POTASSIUM	6010		
SELENIUM	4.7		
SILVER	4.23	U	
SODIUM	21500		
THALLIUM	10.5	U	A
VANADIUM	5.89	U	
ZINC	4.3		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	21.2	U	A
ANTIMONY	2.68	U	
ARSENIC	3.09	U	
BARIUM	1.9		
BERYLLIUM	0.3	U	
CADMIUM	2.48	U	
CALCIUM	2680		
CHROMIUM	0.69	U	
COBALT	2.99	U	
COPPER	3.19	U	
IRON	131	U	A
LEAD	1.8	U	
MAGNESIUM	1720		
MANGANESE	8.9		
MERCURY	0.01	U	
NICKEL	9.98	U	
POTASSIUM	5520		
SELENIUM	4.04	U	
SILVER	4.23	U	
SODIUM	21000		
THALLIUM	6.04	U	
VANADIUM	5.89	U	
ZINC	4.1		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	98.3	U	A
ANTIMONY	2.68	U	
ARSENIC	3.8	U	A
BARIUM	34.1		
BERYLLIUM	0.3	U	
CADMIUM	2.48	U	
CALCIUM	9740		
CHROMIUM	4	U	A
COBALT	2.99	U	
COPPER	14.4		
IRON	2180		
LEAD	2.2		
MAGNESIUM	2560		
MANGANESE	71		
MERCURY	0.01	U	
NICKEL	9.98	U	
POTASSIUM	1390	U	A
SELENIUM	4.04	U	
SILVER	4.23	U	
SODIUM	16700		
THALLIUM	7.2	U	A
VANADIUM	5.89	U	
ZINC	8.8		

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: M

nsample 03SW1101
 samp_date 10/17/2006
 lab_id WW5571-001
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1201
 samp_date 10/17/2006
 lab_id WW5571-002
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1301
 samp_date 10/15/2006
 lab_id WW5535-002
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	251	U	A
ANTIMONY	2.68	U	
ARSENIC	4.6	U	A
BARIUM	27.9		
BERYLLIUM	0.3	U	
CADMIUM	2.48	U	
CALCIUM	10700		
CHROMIUM	1.8	U	A
COBALT	2.99	U	
COPPER	19.1		
IRON	696		
LEAD	1.9		
MAGNESIUM	2790		
MANGANESE	54.5		
MERCURY	0.01	U	
NICKEL	9.98	U	
POTASSIUM	2530	U	A
SELENIUM	4.04	U	
SILVER	5	U	A
SODIUM	21200		
THALLIUM	6.04	U	
VANADIUM	5.89	U	
ZINC	6.5		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	442		
ANTIMONY	2.68	U	
ARSENIC	5.6	U	A
BARIUM	27.4		
BERYLLIUM	0.3	U	
CADMIUM	2.48	U	
CALCIUM	10400		
CHROMIUM	1.9	U	A
COBALT	2.99	U	
COPPER	15.6		
IRON	727		
LEAD	2.8		
MAGNESIUM	2700		
MANGANESE	50.7		
MERCURY	0.01	U	
NICKEL	9.98	U	
POTASSIUM	2660	U	A
SELENIUM	4.04	U	
SILVER	5.6	U	A
SODIUM	20600		
THALLIUM	6.04	U	
VANADIUM	5.89	U	
ZINC	6.1		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	111	U	A
ANTIMONY	2.68	U	
ARSENIC	5.2	U	A
BARIUM	51.9		
BERYLLIUM	0.3	U	
CADMIUM	2.48	U	
CALCIUM	12600		
CHROMIUM	1.3	U	A
COBALT	2.99	U	
COPPER	16.6		
IRON	1610		
LEAD	3.4		
MAGNESIUM	3000		
MANGANESE	130		
MERCURY	0.01	U	
NICKEL	16.7	U	A
POTASSIUM	3120	U	A
SELENIUM	4.04	U	
SILVER	4.23	U	
SODIUM	23500		
THALLIUM	9.1	U	A
VANADIUM	5.89	U	
ZINC	9.6		

PROJ_NO: 00464

SDG: CTO041-1 MEDIA: WATER DATA FRACTION: M

nsample 03SW1401
 samp_date 10/15/2006
 lab_id WW5535-001
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1501
 samp_date 10/15/2006
 lab_id WW5535-004
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

nsample 03SW1601
 samp_date 10/15/2006
 lab_id WW5535-003
 qc_type NM
 units UG/L
 Pct_Solids 0.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	122	U	A
ANTIMONY	3	U	A
ARSENIC	3.6	U	A
BARIUM	25.4		
BERYLLIUM	0.3	U	
CADMIUM	2.48	U	
CALCIUM	12500		
CHROMIUM	1	U	A
COBALT	2.99	U	
COPPER	20.7		
IRON	861		
LEAD	1.8	U	
MAGNESIUM	3000		
MANGANESE	58.8		
MERCURY	0.01	U	
NICKEL	9.98	U	
POTASSIUM	4390	U	A
SELENIUM	4.04	U	
SILVER	4.2	U	A
SODIUM	20200		
THALLIUM	9.9	U	A
VANADIUM	5.89	U	
ZINC	7.8		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	427		
ANTIMONY	2.68	U	
ARSENIC	3.09	U	
BARIUM	53.3		
BERYLLIUM	0.3	U	
CADMIUM	2.48	U	
CALCIUM	11900		
CHROMIUM	1.4	U	A
COBALT	2.99	U	
COPPER	15.5		
IRON	2780		
LEAD	1.9		
MAGNESIUM	3430		
MANGANESE	63.6		
MERCURY	0.01	U	
NICKEL	9.98	U	
POTASSIUM	3880	U	A
SELENIUM	4.04	U	
SILVER	4.23	U	
SODIUM	18400		
THALLIUM	9.5	U	A
VANADIUM	5.89	U	
ZINC	6.8		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	269	U	A
ANTIMONY	2.68	U	
ARSENIC	3.09	U	
BARIUM	20.5		
BERYLLIUM	0.3	U	
CADMIUM	2.48	U	
CALCIUM	10700		
CHROMIUM	1.7	U	A
COBALT	2.99	U	
COPPER	12.6		
IRON	1080		
LEAD	1.8	U	
MAGNESIUM	2300		
MANGANESE	58.4		
MERCURY	0.01	U	
NICKEL	9.98	U	
POTASSIUM	5090		
SELENIUM	4.04	U	
SILVER	4.23	U	
SODIUM	11600		
THALLIUM	9.4	U	A
VANADIUM	5.89	U	
ZINC	5.8		

- Value < Reporting Limit (RL); report RL followed by a U.
- Value > RL and < Action level; report value followed by a U.

An action level of 10X the maximum contaminant concentration was established for methylene chloride; 5X for 4-methyl-2-pentanone to evaluate laboratory contamination. Dilution factors, percent solids, and sample aliquots were taken into consideration during the application of all action levels. The positive results for methylene chloride below the blank action level were qualified as non-detected, U.

Despite the absence of acetone in the laboratory method blanks, acetone is a common laboratory contaminant and was qualified as estimated, J, in environmental samples.

SVOA

The continuing calibration analyzed on 11/06/06 @14:35, on instrument GCMS-U had a relative response factor (RRF) less than the 0.05 quality control limit for 3-nitroaniline. Non-detected results for 3-nitroaniline have been rejected, UR, in samples 03SD0101, 03SD0201, 03SD0401, 03SD0501, 03SD0801, 03SD1101, and 03SD1201.

Pesticides

Sample 03SD0301 was re-extracted and re-analyzed by the laboratory at the request of the project manager. The sample was re-prepared and re-analyzed because the laboratory noted in their case narrative that the sample had inadvertently undergone a sulfuric acid clean-up step. The laboratory noted that the clean-up step will compromise the ability to detect the following pesticides: Dieldrin, Endrin, Endosulfan II, Endrin Aldehyde, and Methoxychlor. Although the re-extraction was performed for corrective action purposes, the sample was re-extracted grossly outside (>28 days) of the acceptable holding time. Therefore, the original sample results were used for all pesticides except for those previously referenced. Nondetected results for the aforementioned compromised compounds were used from the re-extraction and re-analysis because the compounds could have been detected if present. Despite the effort to generate usable data for this sample the re-extraction results were qualified as rejected, UR, for gross holding time exceedance.

PCBs

No qualification of the data was necessary.

Herbicides

No qualification of the data was necessary.

Notes

Positive results reported below the quantitation limit but above the method detection limit were qualified as estimated, J.

Executive Summary

Laboratory Performance: One SVOA compound failed RRF control limit resulting in the rejection of several non-detected results. Qualification of the data resulted from laboratory contamination. A laboratory preparation mistake affecting 1 pesticide sample resulted in the rejection of data.

Other Factors Affecting Data Quality: None.

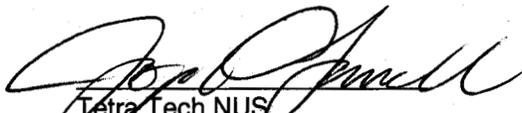
The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DoD Guidelines and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS
Edward Sedlmyer
Chemist/Data Validator



Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OV

nsample 03SD0101
 samp_date 10/12/2006
 lab_id WW5492-5
 qc_type NM
 units UG/KG
 Pct_Solids 66.6
 DUP_OF:

nsample 03SD0101
 samp_date 10/12/2006
 lab_id WW5492-5
 qc_type NM
 units UG/KG
 Pct_Solids 66.6
 DUP_OF:

nsample 03SD0201RA
 samp_date 10/12/2006
 lab_id WW5492-4RA
 qc_type NM
 units UG/KG
 Pct_Solids 64.6
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	8	U	
1,1,2,2-TETRACHLOROETHANE	8	U	
1,1,2-TRICHLOROETHANE	8	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	8	U	
1,1-DICHLOROETHANE	8	U	
1,1-DICHLOROETHENE	8	U	
1,2,4-TRICHLOROBENZENE	8	U	
1,2-DIBROMO-3-CHLOROPROPANE	8	U	
1,2-DIBROMOETHANE	8	U	
1,2-DICHLOROBENZENE	8	U	
1,2-DICHLOROETHANE	8	U	
1,2-DICHLOROPROPANE	8	U	
1,3-DICHLOROBENZENE	8	U	
1,4-DICHLOROBENZENE	8	U	
2-BUTANONE	41	U	
2-HEXANONE	41	U	
4-METHYL-2-PENTANONE	41	U	
ACETONE	57	J	A
BENZENE	8	U	
BROMODICHLOROMETHANE	8	U	
BROMOFORM	8	U	
BROMOMETHANE	8	U	
CARBON DISULFIDE	8	U	
CARBON TETRACHLORIDE	8	U	
CHLOROBENZENE	8	U	
CHLORODIBROMOMETHANE	8	U	
CHLOROETHANE	8	U	
CHLOROFORM	8	U	
CHLOROMETHANE	8	U	
CIS-1,2-DICHLOROETHENE	8	U	
CIS-1,3-DICHLOROPROPENE	8	U	
CYCLOHEXANE	8	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	8	U	
ETHYLBENZENE	8	U	
ISOPROPYLBENZENE	8	U	
M+P-XYLENES	16	U	
METHYL ACETATE	8	U	
METHYL CYCLOHEXANE	8	U	
METHYL TERT-BUTYL ETHER	8	U	
METHYLENE CHLORIDE	28	U	A
O-XYLENE	8	U	
STYRENE	8	U	
TETRACHLOROETHENE	8	U	
TOLUENE	8	U	
TOTAL 1,2-DICHLOROETHENE	16	U	
TOTAL XYLENES	24	U	
TRANS-1,2-DICHLOROETHENE	8	U	
TRANS-1,3-DICHLOROPROPENE	8	U	
TRICHLOROETHENE	8	U	
TRICHLOROFLUOROMETHANE	8	U	
VINYL CHLORIDE	8	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	8	U	
1,1,2,2-TETRACHLOROETHANE	8	U	
1,1,2-TRICHLOROETHANE	8	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	8	U	
1,1-DICHLOROETHANE	8	U	
1,1-DICHLOROETHENE	8	U	
1,2,4-TRICHLOROBENZENE	8	U	
1,2-DIBROMO-3-CHLOROPROPANE	8	U	
1,2-DIBROMOETHANE	8	U	
1,2-DICHLOROBENZENE	8	U	
1,2-DICHLOROETHANE	8	U	
1,2-DICHLOROPROPANE	8	U	
1,3-DICHLOROBENZENE	8	U	
1,4-DICHLOROBENZENE	8	U	
2-BUTANONE	41	U	
2-HEXANONE	41	U	
4-METHYL-2-PENTANONE	41	U	
ACETONE	40	J	AP
BENZENE	8	U	
BROMODICHLOROMETHANE	8	U	
BROMOFORM	8	U	
BROMOMETHANE	8	U	
CARBON DISULFIDE	8	U	
CARBON TETRACHLORIDE	8	U	
CHLOROBENZENE	8	U	
CHLORODIBROMOMETHANE	8	U	
CHLOROETHANE	8	U	
CHLOROFORM	8	U	
CHLOROMETHANE	8	U	
CIS-1,2-DICHLOROETHENE	8	U	
CIS-1,3-DICHLOROPROPENE	8	U	
CYCLOHEXANE	8	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OV

nsample 03SD0201RA
 samp_date 10/12/2006
 lab_id WW5492-4RA
 qc_type NM
 units UG/KG
 Pct_Solids 64.6
 DUP_OF:

nsample 03SD0301
 samp_date 10/12/2006
 lab_id WW5492-3
 qc_type NM
 units UG/KG
 Pct_Solids 78.5
 DUP_OF:

nsample 03SD0301
 samp_date 10/12/2006
 lab_id WW5492-3
 qc_type NM
 units UG/KG
 Pct_Solids 78.5
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	8	U	
ETHYLBENZENE	8	U	
ISOPROPYLBENZENE	8	U	
M+P-XYLENES	16	U	
METHYL ACETATE	8	U	
METHYL CYCLOHEXANE	8	U	
METHYL TERT-BUTYL ETHER	8	U	
METHYLENE CHLORIDE	23	U	A
O-XYLENE	8	U	
STYRENE	8	U	
TETRACHLOROETHENE	8	U	
TOLUENE	8	U	
TOTAL 1,2-DICHLOROETHENE	16	U	
TOTAL XYLENES	25	U	
TRANS-1,2-DICHLOROETHENE	8	U	
TRANS-1,3-DICHLOROPROPENE	8	U	
TRICHLOROETHENE	8	U	
TRICHLOROFLUOROMETHANE	8	U	
VINYL CHLORIDE	8	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	6	U	
1,1,2,2-TETRACHLOROETHANE	6	U	
1,1,2-TRICHLOROETHANE	6	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	6	U	
1,1-DICHLOROETHANE	6	U	
1,1-DICHLOROETHENE	6	U	
1,2,4-TRICHLOROBENZENE	6	U	
1,2-DIBROMO-3-CHLOROPROPANE	6	U	
1,2-DIBROMOETHANE	6	U	
1,2-DICHLOROBENZENE	6	U	
1,2-DICHLOROETHANE	6	U	
1,2-DICHLOROPROPANE	6	U	
1,3-DICHLOROBENZENE	6	U	
1,4-DICHLOROBENZENE	6	U	
2-BUTANONE	28	U	
2-HEXANONE	28	U	
4-METHYL-2-PENTANONE	28	U	
ACETONE	18	J	AP
BENZENE	6	U	
BROMODICHLOROMETHANE	6	U	
BROMOFORM	6	U	
BROMOMETHANE	6	U	
CARBON DISULFIDE	6	U	
CARBON TETRACHLORIDE	6	U	
CHLOROBENZENE	6	U	
CHLORODIBROMOMETHANE	6	U	
CHLOROETHANE	6	U	
CHLOROFORM	6	U	
CHLOROMETHANE	6	U	
CIS-1,2-DICHLOROETHENE	6	U	
CIS-1,3-DICHLOROPROPENE	6	U	
CYCLOHEXANE	6	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	6	U	
ETHYLBENZENE	6	U	
ISOPROPYLBENZENE	6	U	
M+P-XYLENES	11	U	
METHYL ACETATE	6	U	
METHYL CYCLOHEXANE	6	U	
METHYL TERT-BUTYL ETHER	6	U	
METHYLENE CHLORIDE	11	U	A
O-XYLENE	6	U	
STYRENE	6	U	
TETRACHLOROETHENE	6	U	
TOLUENE	6	U	
TOTAL 1,2-DICHLOROETHENE	11	U	
TOTAL XYLENES	17	U	
TRANS-1,2-DICHLOROETHENE	6	U	
TRANS-1,3-DICHLOROPROPENE	6	U	
TRICHLOROETHENE	6	U	
TRICHLOROFLUOROMETHANE	6	U	
VINYL CHLORIDE	6	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OV

nsample 03SD0401
 samp_date 10/12/2006
 lab_id WW5492-2
 qc_type NM
 units UG/KG
 Pct_Solids 59.1
 DUP_OF:

nsample 03SD0401
 samp_date 10/12/2006
 lab_id WW5492-2
 qc_type NM
 units UG/KG
 Pct_Solids 59.1
 DUP_OF:

nsample 03SD0501
 samp_date 10/12/2006
 lab_id WW5492-1
 qc_type NM
 units UG/KG
 Pct_Solids 70.7
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	15	U	
1,1,2,2-TETRACHLOROETHANE	15	U	
1,1,2-TRICHLOROETHANE	15	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	15	U	
1,1-DICHLOROETHANE	15	U	
1,1-DICHLOROETHENE	15	U	
1,2,4-TRICHLOROENZENE	15	U	
1,2-DIBROMO-3-CHLOROPROPANE	15	U	
1,2-DIBROMOETHANE	15	U	
1,2-DICHLOROENZENE	15	U	
1,2-DICHLOROETHANE	15	U	
1,2-DICHLOROPROPANE	15	U	
1,3-DICHLOROENZENE	15	U	
1,4-DICHLOROENZENE	15	U	
2-BUTANONE	75	U	
2-HEXANONE	75	U	
4-METHYL-2-PENTANONE	75	U	
ACETONE	75	U	
BENZENE	15	U	
BROMODICHLOROMETHANE	15	U	
BROMOFORM	15	U	
BROMOMETHANE	15	U	
CARBON DISULFIDE	7	J	AP
CARBON TETRACHLORIDE	15	U	
CHLOROENZENE	15	U	
CHLORODIBROMOMETHANE	15	U	
CHLOROETHANE	15	U	
CHLOROFORM	15	U	
CHLOROMETHANE	15	U	
CIS-1,2-DICHLOROETHENE	15	U	
CIS-1,3-DICHLOROPROPENE	15	U	
CYCLOHEXANE	15	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	15	U	
ETHYLBENZENE	15	U	
ISOPROPYLBENZENE	15	U	
M+P-XYLENES	30	U	
METHYL ACETATE	15	U	
METHYL CYCLOHEXANE	15	U	
METHYL TERT-BUTYL ETHER	15	U	
METHYLENE CHLORIDE	31	U	A
O-XYLENE	15	U	
STYRENE	15	U	
TETRACHLOROETHENE	15	U	
TOLUENE	15	U	
TOTAL 1,2-DICHLOROETHENE	30	U	
TOTAL XYLENES	45	U	
TRANS-1,2-DICHLOROETHENE	15	U	
TRANS-1,3-DICHLOROPROPENE	15	U	
TRICHLOROETHENE	15	U	
TRICHLOROFLUOROMETHANE	15	U	
VINYL CHLORIDE	15	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	10	U	
1,1,2,2-TETRACHLOROETHANE	10	U	
1,1,2-TRICHLOROETHANE	10	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	10	U	
1,1-DICHLOROETHANE	10	U	
1,1-DICHLOROETHENE	10	U	
1,2,4-TRICHLOROENZENE	10	U	
1,2-DIBROMO-3-CHLOROPROPANE	10	U	
1,2-DIBROMOETHANE	10	U	
1,2-DICHLOROENZENE	10	U	
1,2-DICHLOROETHANE	10	U	
1,2-DICHLOROPROPANE	10	U	
1,3-DICHLOROENZENE	10	U	
1,4-DICHLOROENZENE	10	U	
2-BUTANONE	52	U	
2-HEXANONE	52	U	
4-METHYL-2-PENTANONE	52	U	
ACETONE	81	J	A
BENZENE	10	U	
BROMODICHLOROMETHANE	10	U	
BROMOFORM	10	U	
BROMOMETHANE	10	U	
CARBON DISULFIDE	10	U	
CARBON TETRACHLORIDE	10	U	
CHLOROENZENE	10	U	
CHLORODIBROMOMETHANE	10	U	
CHLOROETHANE	10	U	
CHLOROFORM	10	U	
CHLOROMETHANE	10	U	
CIS-1,2-DICHLOROETHENE	10	U	
CIS-1,3-DICHLOROPROPENE	10	U	
CYCLOHEXANE	10	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OV

nsample 03SD0501
 samp_date 10/12/2006
 lab_id WW5492-1
 qc_type NM
 units UG/KG
 Pct_Solids 70.7
 DUP_OF:

nsample 03SD0601
 samp_date 10/13/2006
 lab_id WW5514-1
 qc_type NM
 units UG/KG
 Pct_Solids 77.6
 DUP_OF:

nsample 03SD0601
 samp_date 10/13/2006
 lab_id WW5514-1
 qc_type NM
 units UG/KG
 Pct_Solids 77.6
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	10	U	
ETHYLBENZENE	10	U	
ISOPROPYLBENZENE	10	U	
M+P-XYLENES	21	U	
METHYL ACETATE	10	U	
METHYL CYCLOHEXANE	10	U	
METHYL TERT-BUTYL ETHER	10	U	
METHYLENE CHLORIDE	17	U	A
O-XYLENE	10	U	
STYRENE	10	U	
TETRACHLOROETHENE	10	U	
TOLUENE	10	U	
TOTAL 1,2-DICHLOROETHENE	21	U	
TOTAL XYLENES	31	U	
TRANS-1,2-DICHLOROETHENE	10	U	
TRANS-1,3-DICHLOROPROPENE	10	U	
TRICHLOROETHENE	10	U	
TRICHLOROFLUOROMETHANE	10	U	
VINYL CHLORIDE	10	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	6	U	
1,1,2,2-TETRACHLOROETHANE	6	U	
1,1,2-TRICHLOROETHANE	6	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	6	U	
1,1-DICHLOROETHANE	6	U	
1,1-DICHLOROETHENE	6	U	
1,2,4-TRICHLOROBENZENE	6	U	
1,2-DIBROMO-3-CHLOROPROPANE	6	U	
1,2-DIBROMOETHANE	6	U	
1,2-DICHLOROBENZENE	6	U	
1,2-DICHLOROETHANE	6	U	
1,2-DICHLOROPROPANE	6	U	
1,3-DICHLOROBENZENE	6	U	
1,4-DICHLOROBENZENE	6	U	
2-BUTANONE	32	U	
2-HEXANONE	32	U	
4-METHYL-2-PENTANONE	32	U	
ACETONE	32	J	AP
BENZENE	6	U	
BROMODICHLOROMETHANE	6	U	
BROMOFORM	6	U	
BROMOMETHANE	6	U	
CARBON DISULFIDE	6	U	
CARBON TETRACHLORIDE	6	U	
CHLOROBENZENE	6	U	
CHLORODIBROMOMETHANE	6	U	
CHLOROETHANE	6	U	
CHLOROFORM	6	U	
CHLOROMETHANE	6	U	
CIS-1,2-DICHLOROETHENE	6	U	
CIS-1,3-DICHLOROPROPENE	6	U	
CYCLOHEXANE	6	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	6	U	
ETHYLBENZENE	6	U	
ISOPROPYLBENZENE	6	U	
M+P-XYLENES	13	U	
METHYL ACETATE	6	U	
METHYL CYCLOHEXANE	6	U	
METHYL TERT-BUTYL ETHER	6	U	
METHYLENE CHLORIDE	8	U	A
O-XYLENE	6	U	
STYRENE	6	U	
TETRACHLOROETHENE	6	U	
TOLUENE	6	U	
TOTAL 1,2-DICHLOROETHENE	13	U	
TOTAL XYLENES	19	U	
TRANS-1,2-DICHLOROETHENE	6	U	
TRANS-1,3-DICHLOROPROPENE	6	U	
TRICHLOROETHENE	6	U	
TRICHLOROFLUOROMETHANE	6	U	
VINYL CHLORIDE	6	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OV

nsample 03SD0601D
 samp_date 10/13/2006
 lab_id WW5514-2
 qc_type NM
 units UG/KG
 Pct_Solids 70.8
 DUP_OF: 03SD0601

nsample 03SD0601D
 samp_date 10/13/2006
 lab_id WW5514-2
 qc_type NM
 units UG/KG
 Pct_Solids 70.8
 DUP_OF: 03SD0601

nsample 03SD0701
 samp_date 10/13/2006
 lab_id WW5514-3
 qc_type NM
 units UG/KG
 Pct_Solids 83.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	7	U	
1,1,2,2-TETRACHLOROETHANE	7	U	
1,1,2-TRICHLOROETHANE	7	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	7	U	
1,1-DICHLOROETHANE	7	U	
1,1-DICHLOROETHENE	7	U	
1,2,4-TRICHLOROENZENE	7	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	7	U	
1,2-DICHLOROENZENE	7	U	
1,2-DICHLOROETHANE	7	U	
1,2-DICHLOROPROPANE	7	U	
1,3-DICHLOROENZENE	7	U	
1,4-DICHLOROENZENE	7	U	
2-BUTANONE	35	U	
2-HEXANONE	35	U	
4-METHYL-2-PENTANONE	35	U	
ACETONE	43	J	A
BENZENE	7	U	
BROMODICHLOROMETHANE	7	U	
BROMOFORM	7	U	
BROMOMETHANE	7	U	
CARBON DISULFIDE	7	U	
CARBON TETRACHLORIDE	7	U	
CHLOROENZENE	7	U	
CHLORODIBROMOMETHANE	7	U	
CHLOROETHANE	7	U	
CHLOROFORM	7	U	
CHLOROMETHANE	7	U	
CIS-1,2-DICHLOROETHENE	7	U	
CIS-1,3-DICHLOROPROPENE	7	U	
CYCLOHEXANE	7	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	7	U	
ETHYLBENZENE	7	U	
ISOPROPYLBENZENE	7	U	
M+P-XYLENES	14	U	
METHYL ACETATE	7	U	
METHYL CYCLOHEXANE	7	U	
METHYL TERT-BUTYL ETHER	7	U	
METHYLENE CHLORIDE	12	U	A
O-XYLENE	7	U	
STYRENE	7	U	
TETRACHLOROETHENE	7	U	
TOLUENE	7	U	
TOTAL 1,2-DICHLOROETHENE	14	U	
TOTAL XYLENES	21	U	
TRANS-1,2-DICHLOROETHENE	7	U	
TRANS-1,3-DICHLOROPROPENE	7	U	
TRICHLOROETHENE	7	U	
TRICHLOROFUOROMETHANE	7	U	
VINYL CHLORIDE	7	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROENZENE	5	U	
1,4-DICHLOROENZENE	5	U	
2-BUTANONE	26	U	
2-HEXANONE	26	U	
4-METHYL-2-PENTANONE	26	U	
ACETONE	22	J	AP
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OV

nsample 03SD0701
 samp_date 10/13/2006
 lab_id WW5514-3
 qc_type NM
 units UG/KG
 Pct_Solids 83.4
 DUP_OF:

nsample 03SD0801
 samp_date 10/16/2006
 lab_id WW5540-6
 qc_type NM
 units UG/KG
 Pct_Solids 85.9
 DUP_OF:

nsample 03SD0801
 samp_date 10/16/2006
 lab_id WW5540-6
 qc_type NM
 units UG/KG
 Pct_Solids 85.9
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	12	U	A
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	16	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	6	U	
1,1,2,2-TETRACHLOROETHANE	6	U	
1,1,2-TRICHLOROETHANE	6	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	6	U	
1,1-DICHLOROETHANE	6	U	
1,1-DICHLOROETHENE	6	U	
1,2,4-TRICHLOROBENZENE	6	U	
1,2-DIBROMO-3-CHLOROPROPANE	6	U	
1,2-DIBROMOETHANE	6	U	
1,2-DICHLOROBENZENE	6	U	
1,2-DICHLOROETHANE	6	U	
1,2-DICHLOROPROPANE	6	U	
1,3-DICHLOROBENZENE	6	U	
1,4-DICHLOROBENZENE	6	U	
2-BUTANONE	28	U	
2-HEXANONE	28	U	
4-METHYL-2-PENTANONE	28	U	
ACETONE	160	J	A
BENZENE	6	U	
BROMODICHLOROMETHANE	6	U	
BROMOFORM	6	U	
BROMOMETHANE	6	U	
CARBON DISULFIDE	6	U	
CARBON TETRACHLORIDE	6	U	
CHLOROBENZENE	6	U	
CHLORODIBROMOMETHANE	6	U	
CHLOROETHANE	6	U	
CHLOROFORM	6	U	
CHLOROMETHANE	6	U	
CIS-1,2-DICHLOROETHENE	6	U	
CIS-1,3-DICHLOROPROPENE	6	U	
CYCLOHEXANE	6	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	6	U	
ETHYLBENZENE	6	U	
ISOPROPYLBENZENE	6	U	
M+P-XYLENES	11	U	
METHYL ACETATE	6	U	
METHYL CYCLOHEXANE	6	U	
METHYL TERT-BUTYL ETHER	6	U	
METHYLENE CHLORIDE	8	U	A
O-XYLENE	6	U	
STYRENE	6	U	
TETRACHLOROETHENE	6	U	
TOLUENE	6	U	
TOTAL 1,2-DICHLOROETHENE	11	U	
TOTAL XYLENES	17	U	
TRANS-1,2-DICHLOROETHENE	6	U	
TRANS-1,3-DICHLOROPROPENE	6	U	
TRICHLOROETHENE	6	U	
TRICHLOROFLUOROMETHANE	6	U	
VINYL CHLORIDE	6	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OV

nsample 03SD0901
 samp_date 10/16/2006
 lab_id WW5540-5
 qc_type NM
 units UG/KG
 Pct_Solids 82.7
 DUP_OF:

nsample 03SD0901
 samp_date 10/16/2006
 lab_id WW5540-5
 qc_type NM
 units UG/KG
 Pct_Solids 82.7
 DUP_OF:

nsample 03SD1001
 samp_date 10/13/2006
 lab_id WW5514-4
 qc_type NM
 units UG/KG
 Pct_Solids 54.7
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	27	U	
2-HEXANONE	27	U	
4-METHYL-2-PENTANONE	27	U	
ACETONE	110	J	A
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROBENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	11	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	7	U	A
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	11	U	
TOTAL XYLENES	16	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	14	U	
1,1,2,2-TETRACHLOROETHANE	14	U	
1,1,2-TRICHLOROETHANE	14	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	14	U	
1,1-DICHLOROETHANE	14	U	
1,1-DICHLOROETHENE	14	U	
1,2,4-TRICHLOROBENZENE	14	U	
1,2-DIBROMO-3-CHLOROPROPANE	14	U	
1,2-DIBROMOETHANE	14	U	
1,2-DICHLOROBENZENE	14	U	
1,2-DICHLOROETHANE	14	U	
1,2-DICHLOROPROPANE	14	U	
1,3-DICHLOROBENZENE	14	U	
1,4-DICHLOROBENZENE	14	U	
2-BUTANONE	69	U	
2-HEXANONE	69	U	
4-METHYL-2-PENTANONE	69	U	
ACETONE	290	J	A
BENZENE	14	U	
BROMODICHLOROMETHANE	14	U	
BROMOFORM	14	U	
BROMOMETHANE	14	U	
CARBON DISULFIDE	3	J	P
CARBON TETRACHLORIDE	14	U	
CHLOROBENZENE	14	U	
CHLORODIBROMOMETHANE	14	U	
CHLOROETHANE	14	U	
CHLOROFORM	14	U	
CHLOROMETHANE	14	U	
CIS-1,2-DICHLOROETHENE	14	U	
CIS-1,3-DICHLOROPROPENE	14	U	
CYCLOHEXANE	14	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OV

nsample 03SD1001
 samp_date 10/13/2006
 lab_id WW5514-4
 qc_type NM
 units UG/KG
 Pct_Solids 54.7
 DUP_OF:

nsample 03SD1101
 samp_date 10/17/2006
 lab_id WW5572-1
 qc_type NM
 units UG/KG
 Pct_Solids 82.5
 DUP_OF:

nsample 03SD1101
 samp_date 10/17/2006
 lab_id WW5572-1
 qc_type NM
 units UG/KG
 Pct_Solids 82.5
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	14	U	
ETHYLBENZENE	14	U	
ISOPROPYLBENZENE	14	U	
M+P-XYLENES	28	U	
METHYL ACETATE	14	U	
METHYL CYCLOHEXANE	14	U	
METHYL TERT-BUTYL ETHER	14	U	
METHYLENE CHLORIDE	25	U	A
O-XYLENE	14	U	
STYRENE	14	U	
TETRACHLOROETHENE	14	U	
TOLUENE	14	U	
TOTAL 1,2-DICHLOROETHENE	28	U	
TOTAL XYLENES	42	U	
TRANS-1,2-DICHLOROETHENE	14	U	
TRANS-1,3-DICHLOROPROPENE	14	U	
TRICHLOROETHENE	14	U	
TRICHLOROFLUOROMETHANE	14	U	
VINYL CHLORIDE	14	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROENZENE	5	U	
1,4-DICHLOROENZENE	5	U	
2-BUTANONE	27	U	
2-HEXANONE	27	U	
4-METHYL-2-PENTANONE	27	U	
ACETONE	21	J	AP
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	11	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	A
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	11	U	
TOTAL XYLENES	16	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OV

nsample 03SD1201RA
 samp_date 10/17/2006
 lab_id WW5572-2RA
 qc_type NM
 units UG/KG
 Pct_Solids 83.0
 DUP_OF:

nsample 03SD1201RA
 samp_date 10/17/2006
 lab_id WW5572-2RA
 qc_type NM
 units UG/KG
 Pct_Solids 83.0
 DUP_OF:

nsample 03SD1301
 samp_date 10/16/2006
 lab_id WW5540-4
 qc_type NM
 units UG/KG
 Pct_Solids 74.3
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	5	U	
1,1,2,2-TETRACHLOROETHANE	5	U	
1,1,2-TRICHLOROETHANE	5	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	5	U	
1,1-DICHLOROETHANE	5	U	
1,1-DICHLOROETHENE	5	U	
1,2,4-TRICHLOROBENZENE	5	U	
1,2-DIBROMO-3-CHLOROPROPANE	5	U	
1,2-DIBROMOETHANE	5	U	
1,2-DICHLOROBENZENE	5	U	
1,2-DICHLOROETHANE	5	U	
1,2-DICHLOROPROPANE	5	U	
1,3-DICHLOROBENZENE	5	U	
1,4-DICHLOROBENZENE	5	U	
2-BUTANONE	26	U	
2-HEXANONE	26	U	
4-METHYL-2-PENTANONE	26	U	
ACETONE	26	U	
BENZENE	5	U	
BROMODICHLOROMETHANE	5	U	
BROMOFORM	5	U	
BROMOMETHANE	5	U	
CARBON DISULFIDE	5	U	
CARBON TETRACHLORIDE	5	U	
CHLOROENZENE	5	U	
CHLORODIBROMOMETHANE	5	U	
CHLOROETHANE	5	U	
CHLOROFORM	5	U	
CHLOROMETHANE	5	U	
CIS-1,2-DICHLOROETHENE	5	U	
CIS-1,3-DICHLOROPROPENE	5	U	
CYCLOHEXANE	5	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	5	U	
ETHYLBENZENE	5	U	
ISOPROPYLBENZENE	5	U	
M+P-XYLENES	10	U	
METHYL ACETATE	5	U	
METHYL CYCLOHEXANE	5	U	
METHYL TERT-BUTYL ETHER	5	U	
METHYLENE CHLORIDE	5	U	A
O-XYLENE	5	U	
STYRENE	5	U	
TETRACHLOROETHENE	5	U	
TOLUENE	5	U	
TOTAL 1,2-DICHLOROETHENE	10	U	
TOTAL XYLENES	16	U	
TRANS-1,2-DICHLOROETHENE	5	U	
TRANS-1,3-DICHLOROPROPENE	5	U	
TRICHLOROETHENE	5	U	
TRICHLOROFLUOROMETHANE	5	U	
VINYL CHLORIDE	5	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	7	U	
1,1,2,2-TETRACHLOROETHANE	7	U	
1,1,2-TRICHLOROETHANE	7	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	7	U	
1,1-DICHLOROETHANE	7	U	
1,1-DICHLOROETHENE	7	U	
1,2,4-TRICHLOROBENZENE	7	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	7	U	
1,2-DICHLOROBENZENE	7	U	
1,2-DICHLOROETHANE	7	U	
1,2-DICHLOROPROPANE	7	U	
1,3-DICHLOROBENZENE	7	U	
1,4-DICHLOROBENZENE	7	U	
2-BUTANONE	34	U	
2-HEXANONE	34	U	
4-METHYL-2-PENTANONE	34	U	
ACETONE	26	J	AP
BENZENE	7	U	
BROMODICHLOROMETHANE	7	U	
BROMOFORM	7	U	
BROMOMETHANE	7	U	
CARBON DISULFIDE	7	U	
CARBON TETRACHLORIDE	7	U	
CHLOROENZENE	7	U	
CHLORODIBROMOMETHANE	7	U	
CHLOROETHANE	7	U	
CHLOROFORM	7	U	
CHLOROMETHANE	7	U	
CIS-1,2-DICHLOROETHENE	7	U	
CIS-1,3-DICHLOROPROPENE	7	U	
CYCLOHEXANE	7	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OV

nsample 03SD1301
 samp_date 10/16/2006
 lab_id WW5540-4
 qc_type NM
 units UG/KG
 Pct_Solids 74.3
 DUP_OF:

nsample 03SD1401
 samp_date 10/16/2006
 lab_id WW5540-3
 qc_type NM
 units UG/KG
 Pct_Solids 79.4
 DUP_OF:

nsample 03SD1401
 samp_date 10/16/2006
 lab_id WW5540-3
 qc_type NM
 units UG/KG
 Pct_Solids 79.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	7	U	
ETHYLBENZENE	7	U	
ISOPROPYLBENZENE	7	U	
M+P-XYLENES	13	U	
METHYL ACETATE	7	U	
METHYL CYCLOHEXANE	7	U	
METHYL TERT-BUTYL ETHER	7	U	
METHYLENE CHLORIDE	12	U	A
O-XYLENE	7	U	
STYRENE	7	U	
TETRACHLOROETHENE	7	U	
TOLUENE	7	U	
TOTAL 1,2-DICHLOROETHENE	13	U	
TOTAL XYLENES	20	U	
TRANS-1,2-DICHLOROETHENE	7	U	
TRANS-1,3-DICHLOROPROPENE	7	U	
TRICHLOROETHENE	7	U	
TRICHLOROFLUOROMETHANE	7	U	
VINYL CHLORIDE	7	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	6	U	
1,1,2,2-TETRACHLOROETHANE	6	U	
1,1,2-TRICHLOROETHANE	6	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	6	U	
1,1-DICHLOROETHANE	6	U	
1,1-DICHLOROETHENE	6	U	
1,2,4-TRICHLOROBENZENE	6	U	
1,2-DIBROMO-3-CHLOROPROPANE	6	U	
1,2-DIBROMOETHANE	6	U	
1,2-DICHLOROBENZENE	6	U	
1,2-DICHLOROETHANE	6	U	
1,2-DICHLOROPROPANE	6	U	
1,3-DICHLOROBENZENE	6	U	
1,4-DICHLOROBENZENE	6	U	
2-BUTANONE	29	U	
2-HEXANONE	29	U	
4-METHYL-2-PENTANONE	29	U	
ACETONE	25	J	AP
BENZENE	6	U	
BROMODICHLOROMETHANE	6	U	
BROMOFORM	6	U	
BROMOMETHANE	6	U	
CARBON DISULFIDE	6	U	
CARBON TETRACHLORIDE	6	U	
CHLOROBENZENE	6	U	
CHLORODIBROMOMETHANE	6	U	
CHLOROETHANE	6	U	
CHLOROFORM	6	U	
CHLOROMETHANE	6	U	
CIS-1,2-DICHLOROETHENE	6	U	
CIS-1,3-DICHLOROPROPENE	6	U	
CYCLOHEXANE	6	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	6	U	
ETHYLBENZENE	6	U	
ISOPROPYLBENZENE	6	U	
M+P-XYLENES	11	U	
METHYL ACETATE	6	U	
METHYL CYCLOHEXANE	6	U	
METHYL TERT-BUTYL ETHER	6	U	
METHYLENE CHLORIDE	8	U	A
O-XYLENE	6	U	
STYRENE	6	U	
TETRACHLOROETHENE	6	U	
TOLUENE	6	U	
TOTAL 1,2-DICHLOROETHENE	11	U	
TOTAL XYLENES	17	U	
TRANS-1,2-DICHLOROETHENE	6	U	
TRANS-1,3-DICHLOROPROPENE	6	U	
TRICHLOROETHENE	6	U	
TRICHLOROFLUOROMETHANE	6	U	
VINYL CHLORIDE	6	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OV

nsample 03SD1501
 samp_date 10/16/2006
 lab_id WW5540-2
 qc_type NM
 units UG/KG
 Pct_Solids 79.0
 DUP_OF:

nsample 03SD1501
 samp_date 10/16/2006
 lab_id WW5540-2
 qc_type NM
 units UG/KG
 Pct_Solids 79.0
 DUP_OF:

nsample 03SD1601
 samp_date 10/16/2006
 lab_id WW5540-1
 qc_type NM
 units UG/KG
 Pct_Solids 76.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	6	U	
1,1,2,2-TETRACHLOROETHANE	6	U	
1,1,2-TRICHLOROETHANE	6	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	6	U	
1,1-DICHLOROETHANE	6	U	
1,1-DICHLOROETHENE	6	U	
1,2,4-TRICHLOROENZENE	6	U	
1,2-DIBROMO-3-CHLOROPROPANE	6	U	
1,2-DIBROMOETHANE	6	U	
1,2-DICHLOROENZENE	6	U	
1,2-DICHLOROETHANE	6	U	
1,2-DICHLOROPROPANE	6	U	
1,3-DICHLOROENZENE	6	U	
1,4-DICHLOROENZENE	6	U	
2-BUTANONE	32	U	
2-HEXANONE	32	U	
4-METHYL-2-PENTANONE	32	U	
ACETONE	23	J	AP
BENZENE	6	U	
BROMODICHLOROMETHANE	6	U	
BROMOFORM	6	U	
BROMOMETHANE	6	U	
CARBON DISULFIDE	6	U	
CARBON TETRACHLORIDE	6	U	
CHLOROENZENE	6	U	
CHLORODIBROMOMETHANE	6	U	
CHLOROETHANE	6	U	
CHLOROFORM	6	U	
CHLOROMETHANE	6	U	
CIS-1,2-DICHLOROETHENE	6	U	
CIS-1,3-DICHLOROPROPENE	6	U	
CYCLOHEXANE	6	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	6	U	
ETHYLBENZENE	6	U	
ISOPROPYLBENZENE	6	U	
M+P-XYLENES	13	U	
METHYL ACETATE	6	U	
METHYL CYCLOHEXANE	6	U	
METHYL TERT-BUTYL ETHER	6	U	
METHYLENE CHLORIDE	15	U	A
O-XYLENE	6	U	
STYRENE	6	U	
TETRACHLOROETHENE	6	U	
TOLUENE	6	U	
TOTAL 1,2-DICHLOROETHENE	13	U	
TOTAL XYLENES	19	U	
TRANS-1,2-DICHLOROETHENE	6	U	
TRANS-1,3-DICHLOROPROPENE	6	U	
TRICHLOROETHENE	6	U	
TRICHLOROFUOROMETHANE	6	U	
VINYL CHLORIDE	6	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	7	U	
1,1,2,2-TETRACHLOROETHANE	7	U	
1,1,2-TRICHLOROETHANE	7	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	7	U	
1,1-DICHLOROETHANE	7	U	
1,1-DICHLOROETHENE	7	U	
1,2,4-TRICHLOROENZENE	7	U	
1,2-DIBROMO-3-CHLOROPROPANE	7	U	
1,2-DIBROMOETHANE	7	U	
1,2-DICHLOROENZENE	7	U	
1,2-DICHLOROETHANE	7	U	
1,2-DICHLOROPROPANE	7	U	
1,3-DICHLOROENZENE	7	U	
1,4-DICHLOROENZENE	7	U	
2-BUTANONE	34	U	
2-HEXANONE	34	U	
4-METHYL-2-PENTANONE	34	U	
ACETONE	54	J	A
BENZENE	7	U	
BROMODICHLOROMETHANE	7	U	
BROMOFORM	7	U	
BROMOMETHANE	7	U	
CARBON DISULFIDE	7	U	
CARBON TETRACHLORIDE	7	U	
CHLOROENZENE	7	U	
CHLORODIBROMOMETHANE	7	U	
CHLOROETHANE	7	U	
CHLOROFORM	7	U	
CHLOROMETHANE	7	U	
CIS-1,2-DICHLOROETHENE	7	U	
CIS-1,3-DICHLOROPROPENE	7	U	
CYCLOHEXANE	7	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OV

nsample 03SD1601
samp_date 10/16/2006
lab_id WW5540-1
qc_type NM
units UG/KG
Pct_Solids 76.0
DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	7	U	
ETHYLBENZENE	7	U	
ISOPROPYLBENZENE	7	U	
M+P-XYLENES	14	U	
METHYL ACETATE	7	U	
METHYL CYCLOHEXANE	7	U	
METHYL TERT-BUTYL ETHER	7	U	
METHYLENE CHLORIDE	8	U	A
O-XYLENE	7	U	
STYRENE	7	U	
TETRACHLOROETHENE	7	U	
TOLUENE	7	U	
TOTAL 1,2-DICHLOROETHENE	14	U	
TOTAL XYLENES	20	U	
TRANS-1,2-DICHLOROETHENE	7	U	
TRANS-1,3-DICHLOROPROPENE	7	U	
TRICHLOROETHENE	7	U	
TRICHLOROFLUOROMETHANE	7	U	
VINYL CHLORIDE	7	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD0101
 samp_date 10/12/2006
 lab_id WW5492-5
 qc_type NM
 units UG/KG
 Pct_Solids 66.6
 DUP_OF:

nsample 03SD0101
 samp_date 10/12/2006
 lab_id WW5492-5
 qc_type NM
 units UG/KG
 Pct_Solids 66.6
 DUP_OF:

nsample 03SD0101
 samp_date 10/12/2006
 lab_id WW5492-5
 qc_type NM
 units UG/KG
 Pct_Solids 66.6
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	500	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	500	U	
2,4,5-TRICHLOROPHENOL	1200	U	
2,4,6-TRICHLOROPHENOL	500	U	
2,4-DICHLOROPHENOL	500	U	
2,4-DIMETHYLPHENOL	500	U	
2,4-DINITROPHENOL	1200	U	
2,4-DINITROTOLUENE	500	U	
2,6-DINITROTOLUENE	500	U	
2-CHLORONAPHTHALENE	500	U	
2-CHLOROPHENOL	500	U	
2-METHYLNAPHTHALENE	500	U	
2-METHYLPHENOL	500	U	
2-NITROANILINE	1200	U	
2-NITROPHENOL	500	U	
3&4-METHYLPHENOL	500	U	
3,3'-DICHLOROBENZIDINE	500	U	
3-NITROANILINE	1200	UR	C
4,6-DINITRO-2-METHYLPHENOL	1200	U	
4-BROMOPHENYL PHENYL ETHER	500	U	
4-CHLORO-3-METHYLPHENOL	500	U	
4-CHLOROANILINE	500	U	
4-CHLOROPHENYL PHENYL ETHER	500	U	
4-NITROANILINE	1200	U	
4-NITROPHENOL	1200	U	
ACENAPHTHENE	500	U	
ACENAPHTHYLENE	500	U	
ACETOPHENONE	500	U	
ANTHRACENE	500	U	
ATRAZINE	500	U	
BENZALDEHYDE	500	U	
BENZO(A)ANTHRACENE	500	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	500	U	
BENZO(B)FLUORANTHENE	500	U	
BENZO(G,H,I)PERYLENE	500	U	
BENZO(K)FLUORANTHENE	500	U	
BIS(2-CHLOROETHOXY)METHANE	500	U	
BIS(2-CHLOROETHYL)ETHER	500	U	
BIS(2-ETHYLHEXYL)PHTHALATE	500	U	
BUTYL BENZYL PHTHALATE	500	U	
CAPROLACTAM	500	U	
CARBAZOLE	500	U	
CHRYSENE	500	U	
DIBENZO(A,H)ANTHRACENE	500	U	
DIBENZOFURAN	500	U	
DIETHYL PHTHALATE	500	U	
DIMETHYL PHTHALATE	500	U	
DI-N-BUTYL PHTHALATE	500	U	
DI-N-OCTYL PHTHALATE	500	U	
FLUORANTHENE	500	U	
FLUORENE	500	U	
HEXACHLOROENZENE	500	U	
HEXACHLOROBUTADIENE	500	U	
HEXACHLOROCYCLOPENTADIENE	500	U	
HEXACHLOROETHANE	500	U	
INDENO(1,2,3-CD)PYRENE	500	U	
ISOPHORONE	500	U	
NAPHTHALENE	500	U	
NITROBENZENE	500	U	
N-NITROSO-DI-N-PROPYLAMINE	500	U	
N-NITROSODIPHENYLAMINE	500	U	
PENTACHLOROPHENOL	1200	U	
PHENANTHRENE	500	U	
PHENOL	500	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	500	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD0201
 samp_date 10/12/2006
 lab_id WW5492-4
 qc_type NM
 units UG/KG
 Pct_Solids 64.6
 DUP_OF:

nsample 03SD0201
 samp_date 10/12/2006
 lab_id WW5492-4
 qc_type NM
 units UG/KG
 Pct_Solids 64.6
 DUP_OF:

nsample 03SD0201
 samp_date 10/12/2006
 lab_id WW5492-4
 qc_type NM
 units UG/KG
 Pct_Solids 64.6
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	510	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	510	U	
2,4,5-TRICHLOROPHENOL	1300	U	
2,4,6-TRICHLOROPHENOL	510	U	
2,4-DICHLOROPHENOL	510	U	
2,4-DIMETHYLPHENOL	510	U	
2,4-DINITROPHENOL	1300	U	
2,4-DINITROTOLUENE	510	U	
2,6-DINITROTOLUENE	510	U	
2-CHLORONAPHTHALENE	510	U	
2-CHLOROPHENOL	510	U	
2-METHYLNAPHTHALENE	510	U	
2-METHYLPHENOL	510	U	
2-NITROANILINE	1300	U	
2-NITROPHENOL	510	U	
3&4-METHYLPHENOL	510	U	
3,3'-DICHLOROBENZIDINE	510	U	
3-NITROANILINE	1300	UR	C
4,6-DINITRO-2-METHYLPHENOL	1300	U	
4-BROMOPHENYL PHENYL ETHER	510	U	
4-CHLORO-3-METHYLPHENOL	510	U	
4-CHLOROANILINE	510	U	
4-CHLOROPHENYL PHENYL ETHER	510	U	
4-NITROANILINE	1300	U	
4-NITROPHENOL	1300	U	
ACENAPHTHENE	510	U	
ACENAPHTHYLENE	510	U	
ACETOPHENONE	510	U	
ANTHRACENE	510	U	
ATRAZINE	510	U	
BENZALDEHYDE	510	U	
BENZO(A)ANTHRACENE	510	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	510	U	
BENZO(B)FLUORANTHENE	510	U	
BENZO(G,H,I)PERYLENE	510	U	
BENZO(K)FLUORANTHENE	510	U	
BIS(2-CHLOROETHOXY)METHANE	510	U	
BIS(2-CHLOROETHYL)ETHER	510	U	
BIS(2-ETHYLHEXYL)PHTHALATE	510	U	
BUTYL BENZYL PHTHALATE	510	U	
CAPROLACTAM	510	U	
CARBAZOLE	510	U	
CHRYSENE	510	U	
DIBENZO(A,H)ANTHRACENE	510	U	
DIBENZOFURAN	510	U	
DIETHYL PHTHALATE	510	U	
DIMETHYL PHTHALATE	510	U	
DI-N-BUTYL PHTHALATE	510	U	
DI-N-OCTYL PHTHALATE	510	U	
FLUORANTHENE	510	U	
FLUORENE	510	U	
HEXACHLOROBENZENE	510	U	
HEXACHLOROBUTADIENE	510	U	
HEXACHLOROCYCLOPENTADIENE	510	U	
HEXACHLOROETHANE	510	U	
INDENO(1,2,3-CD)PYRENE	510	U	
ISOPHORONE	510	U	
NAPHTHALENE	510	U	
NITROBENZENE	510	U	
N-NITROSO-DI-N-PROPYLAMINE	510	U	
N-NITROSODIPHENYLAMINE	510	U	
PENTACHLOROPHENOL	1300	U	
PHENANTHRENE	510	U	
PHENOL	510	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	510	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD0301
 samp_date 10/12/2006
 lab_id WW5492-3
 qc_type NM
 units UG/KG
 Pct_Solids 78.5
 DUP_OF:

nsample 03SD0301
 samp_date 10/12/2006
 lab_id WW5492-3
 qc_type NM
 units UG/KG
 Pct_Solids 78.5
 DUP_OF:

nsample 03SD0301
 samp_date 10/12/2006
 lab_id WW5492-3
 qc_type NM
 units UG/KG
 Pct_Solids 78.5
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	420	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	420	U	
2,4,5-TRICHLOROPHENOL	1000	U	
2,4,6-TRICHLOROPHENOL	420	U	
2,4-DICHLOROPHENOL	420	U	
2,4-DIMETHYLPHENOL	420	U	
2,4-DINITROPHENOL	1000	U	
2,4-DINITROTOLUENE	420	U	
2,6-DINITROTOLUENE	420	U	
2-CHLORONAPHTHALENE	420	U	
2-CHLOROPHENOL	420	U	
2-METHYLNAPHTHALENE	420	U	
2-METHYLPHENOL	420	U	
2-NITROANILINE	1000	U	
2-NITROPHENOL	420	U	
3&4-METHYLPHENOL	420	U	
3,3'-DICHLOROBENZIDINE	420	U	
3-NITROANILINE	1000	U	
4,6-DINITRO-2-METHYLPHENOL	1000	U	
4-BROMOPHENYL PHENYL ETHER	420	U	
4-CHLORO-3-METHYLPHENOL	420	U	
4-CHLOROANILINE	420	U	
4-CHLOROPHENYL PHENYL ETHER	420	U	
4-NITROANILINE	1000	U	
4-NITROPHENOL	1000	U	
ACENAPHTHENE	420	U	
ACENAPHTHYLENE	420	U	
ACETOPHENONE	420	U	
ANTHRACENE	420	U	
ATRAZINE	420	U	
BENZALDEHYDE	420	U	
BENZO(A)ANTHRACENE	420	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	420	U	
BENZO(B)FLUORANTHENE	420	U	
BENZO(G,H,I)PERYLENE	420	U	
BENZO(K)FLUORANTHENE	420	U	
BIS(2-CHLOROETHOXY)METHANE	420	U	
BIS(2-CHLOROETHYL)ETHER	420	U	
BIS(2-ETHYLHEXYL)PHTHALATE	420	U	
BUTYL BENZYL PHTHALATE	420	U	
CAPROLACTAM	420	U	
CARBAZOLE	420	U	
CHRYSENE	420	U	
DIBENZO(A,H)ANTHRACENE	420	U	
DIBENZOFURAN	420	U	
DIETHYL PHTHALATE	420	U	
DIMETHYL PHTHALATE	420	U	
DI-N-BUTYL PHTHALATE	420	U	
DI-N-OCTYL PHTHALATE	420	U	
FLUORANTHENE	420	U	
FLUORENE	420	U	
HEXACHLOROBENZENE	420	U	
HEXACHLOROBUTADIENE	420	U	
HEXACHLOROCYCLOPENTADIENE	420	U	
HEXACHLOROETHANE	420	U	
INDENO(1,2,3-CD)PYRENE	420	U	
ISOPHORONE	420	U	
NAPHTHALENE	420	U	
NITROBENZENE	420	U	
N-NITROSO-DI-N-PROPYLAMINE	420	U	
N-NITROSODIPHENYLAMINE	420	U	
PENTACHLOROPHENOL	1000	U	
PHENANTHRENE	420	U	
PHENOL	420	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	420	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD0401
 samp_date 10/12/2006
 lab_id WW5492-2
 qc_type NM
 units UG/KG
 Pct_Solids 59.1
 DUP_OF:

nsample 03SD0401
 samp_date 10/12/2006
 lab_id WW5492-2
 qc_type NM
 units UG/KG
 Pct_Solids 59.1
 DUP_OF:

nsample 03SD0401
 samp_date 10/12/2006
 lab_id WW5492-2
 qc_type NM
 units UG/KG
 Pct_Solids 59.1
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	560	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	560	U	
2,4,5-TRICHLOROPHENOL	1400	U	
2,4,6-TRICHLOROPHENOL	560	U	
2,4-DICHLOROPHENOL	560	U	
2,4-DIMETHYLPHENOL	560	U	
2,4-DINITROPHENOL	1400	U	
2,4-DINITROTOLUENE	560	U	
2,6-DINITROTOLUENE	560	U	
2-CHLORONAPHTHALENE	560	U	
2-CHLOROPHENOL	560	U	
2-METHYLNAPHTHALENE	560	U	
2-METHYLPHENOL	560	U	
2-NITROANILINE	1400	U	
2-NITROPHENOL	560	U	
3&4-METHYLPHENOL	560	U	
3,3'-DICHLOROBENZIDINE	560	U	
3-NITROANILINE	1400	UR	C
4,6-DINITRO-2-METHYLPHENOL	1400	U	
4-BROMOPHENYL PHENYL ETHER	560	U	
4-CHLORO-3-METHYLPHENOL	560	U	
4-CHLOROANILINE	560	U	
4-CHLOROPHENYL PHENYL ETHER	560	U	
4-NITROANILINE	1400	U	
4-NITROPHENOL	1400	U	
ACENAPHTHENE	560	U	
ACENAPHTHYLENE	560	U	
ACETOPHENONE	560	U	
ANTHRACENE	560	U	
ATRAZINE	560	U	
BENZALDEHYDE	560	U	
BENZO(A)ANTHRACENE	560	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	560	U	
BENZO(B)FLUORANTHENE	560	U	
BENZO(G,H,I)PERYLENE	560	U	
BENZO(K)FLUORANTHENE	560	U	
BIS(2-CHLOROETHOXY)METHANE	560	U	
BIS(2-CHLOROETHYL)ETHER	560	U	
BIS(2-ETHYLHEXYL)PHTHALATE	560	U	
BUTYL BENZYL PHTHALATE	560	U	
CAPROLACTAM	560	U	
CARBAZOLE	560	U	
CHRYSENE	560	U	
DIBENZO(A,H)ANTHRACENE	560	U	
DIBENZOFURAN	560	U	
DIETHYL PHTHALATE	560	U	
DIMETHYL PHTHALATE	560	U	
DI-N-BUTYL PHTHALATE	560	U	
DI-N-OCTYL PHTHALATE	560	U	
FLUORANTHENE	560	U	
FLUORENE	560	U	
HEXACHLOROBENZENE	560	U	
HEXACHLOROBUTADIENE	560	U	
HEXACHLOROCYCLOPENTADIENE	560	U	
HEXACHLOROETHANE	560	U	
INDENO(1,2,3-CD)PYRENE	560	U	
ISOPHORONE	560	U	
NAPHTHALENE	560	U	
NITROBENZENE	560	U	
N-NITROSO-DI-N-PROPYLAMINE	560	U	
N-NITROSODIPHENYLAMINE	560	U	
PENTACHLOROPHENOL	1400	U	
PHENANTHRENE	560	U	
PHENOL	560	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	560	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD0501
 samp_date 10/12/2006
 lab_id WW5492-1
 qc_type NM
 units UG/KG
 Pct_Solids 70.7
 DUP_OF:

nsample 03SD0501
 samp_date 10/12/2006
 lab_id WW5492-1
 qc_type NM
 units UG/KG
 Pct_Solids 70.7
 DUP_OF:

nsample 03SD0501
 samp_date 10/12/2006
 lab_id WW5492-1
 qc_type NM
 units UG/KG
 Pct_Solids 70.7
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	470	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	470	U	
2,4,5-TRICHLOROPHENOL	1200	U	
2,4,6-TRICHLOROPHENOL	470	U	
2,4-DICHLOROPHENOL	470	U	
2,4-DIMETHYLPHENOL	470	U	
2,4-DINITROPHENOL	1200	U	
2,4-DINITROTOLUENE	470	U	
2,6-DINITROTOLUENE	470	U	
2-CHLORONAPHTHALENE	470	U	
2-CHLOROPHENOL	470	U	
2-METHYLNAPHTHALENE	470	U	
2-METHYLPHENOL	470	U	
2-NITROANILINE	1200	U	
2-NITROPHENOL	470	U	
3&4-METHYLPHENOL	470	U	
3,3'-DICHLOROBENZIDINE	470	U	
3-NITROANILINE	1200	UR	C
4,6-DINITRO-2-METHYLPHENOL	1200	U	
4-BROMOPHENYL PHENYL ETHER	470	U	
4-CHLORO-3-METHYLPHENOL	470	U	
4-CHLOROANILINE	470	U	
4-CHLOROPHENYL PHENYL ETHER	470	U	
4-NITROANILINE	1200	U	
4-NITROPHENOL	1200	U	
ACENAPHTHENE	470	U	
ACENAPHTHYLENE	470	U	
ACETOPHENONE	470	U	
ANTHRACENE	470	U	
ATRAZINE	470	U	
BENZALDEHYDE	470	U	
BENZO(A)ANTHRACENE	470	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	470	U	
BENZO(B)FLUORANTHENE	470	U	
BENZO(G,H,I)PERYLENE	470	U	
BENZO(K)FLUORANTHENE	470	U	
BIS(2-CHLOROETHOXY)METHANE	470	U	
BIS(2-CHLOROETHYL)ETHER	470	U	
BIS(2-ETHYLHEXYL)PHTHALATE	470	U	
BUTYL BENZYL PHTHALATE	470	U	
CAPROLACTAM	470	U	
CARBAZOLE	470	U	
CHRYSENE	470	U	
DIBENZO(A,H)ANTHRACENE	470	U	
DIBENZOFURAN	470	U	
DIETHYL PHTHALATE	470	U	
DIMETHYL PHTHALATE	470	U	
DI-N-BUTYL PHTHALATE	470	U	
DI-N-OCTYL PHTHALATE	470	U	
FLUORANTHENE	470	U	
FLUORENE	470	U	
HEXACHLOROBENZENE	470	U	
HEXACHLOROBUTADIENE	470	U	
HEXACHLOROCYCLOPENTADIENE	470	U	
HEXACHLOROETHANE	470	U	
INDENO(1,2,3-CD)PYRENE	470	U	
ISOPHORONE	470	U	
NAPHTHALENE	470	U	
NITROBENZENE	470	U	
N-NITROSO-DI-N-PROPYLAMINE	470	U	
N-NITROSODIPHENYLAMINE	470	U	
PENTACHLOROPHENOL	1200	U	
PHENANTHRENE	470	U	
PHENOL	470	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	470	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD0601
 samp_date 10/13/2006
 lab_id WW5514-1
 qc_type NM
 units UG/KG
 Pct_Solids 77.6
 DUP_OF:

nsample 03SD0601
 samp_date 10/13/2006
 lab_id WW5514-1
 qc_type NM
 units UG/KG
 Pct_Solids 77.6
 DUP_OF:

nsample 03SD0601
 samp_date 10/13/2006
 lab_id WW5514-1
 qc_type NM
 units UG/KG
 Pct_Solids 77.6
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	420	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	420	U	
2,4,5-TRICHLOROPHENOL	1000	U	
2,4,6-TRICHLOROPHENOL	420	U	
2,4-DICHLOROPHENOL	420	U	
2,4-DIMETHYLPHENOL	420	U	
2,4-DINITROPHENOL	1000	U	
2,4-DINITROTOLUENE	420	U	
2,6-DINITROTOLUENE	420	U	
2-CHLORONAPHTHALENE	420	U	
2-CHLOROPHENOL	420	U	
2-METHYLNAPHTHALENE	420	U	
2-METHYLPHENOL	420	U	
2-NITROANILINE	1000	U	
2-NITROPHENOL	420	U	
3&4-METHYLPHENOL	420	U	
3,3'-DICHLOROBENZIDINE	420	U	
3-NITROANILINE	1000	U	
4,6-DINITRO-2-METHYLPHENOL	1000	U	
4-BROMOPHENYL PHENYL ETHER	420	U	
4-CHLORO-3-METHYLPHENOL	420	U	
4-CHLOROANILINE	420	U	
4-CHLOROPHENYL PHENYL ETHER	420	U	
4-NITROANILINE	1000	U	
4-NITROPHENOL	1000	U	
ACENAPHTHENE	420	U	
ACENAPHTHYLENE	420	U	
ACETOPHENONE	420	U	
ANTHRACENE	420	U	
ATRAZINE	420	U	
BENZALDEHYDE	420	U	
BENZO(A)ANTHRACENE	420	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	420	U	
BENZO(B)FLUORANTHENE	420	U	
BENZO(G,H,I)PERYLENE	420	U	
BENZO(K)FLUORANTHENE	420	U	
BIS(2-CHLOROETHOXY)METHANE	420	U	
BIS(2-CHLOROETHYL)ETHER	420	U	
BIS(2-ETHYLHEXYL)PHTHALATE	420	U	
BUTYL BENZYL PHTHALATE	420	U	
CAPROLACTAM	420	U	
CARBAZOLE	420	U	
CHRYSENE	420	U	
DIBENZO(A,H)ANTHRACENE	420	U	
DIBENZOFURAN	420	U	
DIETHYL PHTHALATE	420	U	
DIMETHYL PHTHALATE	420	U	
DI-N-BUTYL PHTHALATE	420	U	
DI-N-OCTYL PHTHALATE	420	U	
FLUORANTHENE	420	U	
FLUORENE	420	U	
HEXACHLOROBENZENE	420	U	
HEXACHLOROBUTADIENE	420	U	
HEXACHLOROCYCLOPENTADIENE	420	U	
HEXACHLOROETHANE	420	U	
INDENO(1,2,3-CD)PYRENE	420	U	
ISOPHORONE	420	U	
NAPHTHALENE	420	U	
NITROBENZENE	420	U	
N-NITROSO-DI-N-PROPYLAMINE	420	U	
N-NITROSODIPHENYLAMINE	420	U	
PENTACHLOROPHENOL	1000	U	
PHENANTHRENE	420	U	
PHENOL	420	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	420	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD0601D
 samp_date 10/13/2006
 lab_id WW5514-2
 qc_type NM
 units UG/KG
 Pct_Solids 70.8
 DUP_OF: 03SD0601

nsample 03SD0601D
 samp_date 10/13/2006
 lab_id WW5514-2
 qc_type NM
 units UG/KG
 Pct_Solids 70.8
 DUP_OF: 03SD0601

nsample 03SD0601D
 samp_date 10/13/2006
 lab_id WW5514-2
 qc_type NM
 units UG/KG
 Pct_Solids 70.8
 DUP_OF: 03SD0601

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	460	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	460	U	
2,4,5-TRICHLOROPHENOL	1200	U	
2,4,6-TRICHLOROPHENOL	460	U	
2,4-DICHLOROPHENOL	460	U	
2,4-DIMETHYLPHENOL	460	U	
2,4-DINITROPHENOL	1200	U	
2,4-DINITROTOLUENE	460	U	
2,6-DINITROTOLUENE	460	U	
2-CHLORONAPHTHALENE	460	U	
2-CHLOROPHENOL	460	U	
2-METHYLNAPHTHALENE	460	U	
2-METHYLPHENOL	460	U	
2-NITROANILINE	1200	U	
2-NITROPHENOL	460	U	
3&4-METHYLPHENOL	460	U	
3,3'-DICHLOROBENZIDINE	460	U	
3-NITROANILINE	1200	U	
4,6-DINITRO-2-METHYLPHENOL	1200	U	
4-BROMOPHENYL PHENYL ETHER	460	U	
4-CHLORO-3-METHYLPHENOL	460	U	
4-CHLOROANILINE	460	U	
4-CHLOROPHENYL PHENYL ETHER	460	U	
4-NITROANILINE	1200	U	
4-NITROPHENOL	1200	U	
ACENAPHTHENE	460	U	
ACENAPHTHYLENE	460	U	
ACETOPHENONE	460	U	
ANTHRACENE	460	U	
ATRAZINE	460	U	
BENZALDEHYDE	460	U	
BENZO(A)ANTHRACENE	460	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	460	U	
BENZO(B)FLUORANTHENE	460	U	
BENZO(G,H,I)PERYLENE	460	U	
BENZO(K)FLUORANTHENE	460	U	
BIS(2-CHLOROETHOXY)METHANE	460	U	
BIS(2-CHLOROETHYL)ETHER	460	U	
BIS(2-ETHYLHEXYL)PHTHALATE	460	U	
BUTYL BENZYL PHTHALATE	460	U	
CAPROLACTAM	460	U	
CARBAZOLE	460	U	
CHRYSENE	460	U	
DIBENZO(A,H)ANTHRACENE	460	U	
DIBENZOFURAN	460	U	
DIETHYL PHTHALATE	460	U	
DIMETHYL PHTHALATE	460	U	
DI-N-BUTYL PHTHALATE	460	U	
DI-N-OCTYL PHTHALATE	460	U	
FLUORANTHENE	460	U	
FLUORENE	460	U	
HEXACHLOROENZENE	460	U	
HEXACHLOROBUTADIENE	460	U	
HEXACHLOROCYCLOPENTADIENE	460	U	
HEXACHLOROETHANE	460	U	
INDENO(1,2,3-CD)PYRENE	460	U	
ISOPHORONE	460	U	
NAPHTHALENE	460	U	
NITROBENZENE	460	U	
N-NITROSO-DI-N-PROPYLAMINE	460	U	
N-NITROSODIPHENYLAMINE	460	U	
PENTACHLOROPHENOL	1200	U	
PHENANTHRENE	460	U	
PHENOL	460	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	460	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD0701
 samp_date 10/13/2006
 lab_id WW5514-3
 qc_type NM
 units UG/KG
 Pct_Solids 83.4
 DUP_OF:

nsample 03SD0701
 samp_date 10/13/2006
 lab_id WW5514-3
 qc_type NM
 units UG/KG
 Pct_Solids 83.4
 DUP_OF:

nsample 03SD0701
 samp_date 10/13/2006
 lab_id WW5514-3
 qc_type NM
 units UG/KG
 Pct_Solids 83.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	400	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	400	U	
2,4,5-TRICHLOROPHENOL	980	U	
2,4,6-TRICHLOROPHENOL	400	U	
2,4-DICHLOROPHENOL	400	U	
2,4-DIMETHYLPHENOL	400	U	
2,4-DINITROPHENOL	980	U	
2,4-DINITROTOLUENE	400	U	
2,6-DINITROTOLUENE	400	U	
2-CHLORONAPHTHALENE	400	U	
2-CHLOROPHENOL	400	U	
2-METHYLNAPHTHALENE	400	U	
2-METHYLPHENOL	400	U	
2-NITROANILINE	980	U	
2-NITROPHENOL	400	U	
3&4-METHYLPHENOL	400	U	
3,3'-DICHLOROBENZIDINE	400	U	
3-NITROANILINE	980	U	
4,6-DINITRO-2-METHYLPHENOL	980	U	
4-BROMOPHENYL PHENYL ETHER	400	U	
4-CHLORO-3-METHYLPHENOL	400	U	
4-CHLOROANILINE	400	U	
4-CHLOROPHENYL PHENYL ETHER	400	U	
4-NITROANILINE	980	U	
4-NITROPHENOL	980	U	
ACENAPHTHENE	400	U	
ACENAPHTHYLENE	400	U	
ACETOPHENONE	400	U	
ANTHRACENE	400	U	
ATRAZINE	400	U	
BENZALDEHYDE	400	U	
BENZO(A)ANTHRACENE	400	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	400	U	
BENZO(B)FLUORANTHENE	400	U	
BENZO(G,H,I)PERYLENE	400	U	
BENZO(K)FLUORANTHENE	400	U	
BIS(2-CHLOROETHOXY)METHANE	400	U	
BIS(2-CHLOROETHYL)ETHER	400	U	
BIS(2-ETHYLHEXYL)PHTHALATE	400	U	
BUTYL BENZYL PHTHALATE	400	U	
CAPROLACTAM	400	U	
CARBAZOLE	400	U	
CHRYSENE	400	U	
DIBENZO(A,H)ANTHRACENE	400	U	
DIBENZOFURAN	400	U	
DIETHYL PHTHALATE	400	U	
DIMETHYL PHTHALATE	400	U	
DI-N-BUTYL PHTHALATE	400	U	
DI-N-OCTYL PHTHALATE	400	U	
FLUORANTHENE	400	U	
FLUORENE	400	U	
HEXACHLOROBENZENE	400	U	
HEXACHLOROBUTADIENE	400	U	
HEXACHLOROCYCLOPENTADIENE	400	U	
HEXACHLOROETHANE	400	U	
INDENO(1,2,3-CD)PYRENE	400	U	
ISOPHORONE	400	U	
NAPHTHALENE	400	U	
NITROBENZENE	400	U	
N-NITROSO-DI-N-PROPYLAMINE	400	U	
N-NITROSODIPHENYLAMINE	400	U	
PENTACHLOROPHENOL	980	U	
PHENANTHRENE	400	U	
PHENOL	400	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	400	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD0801
 samp_date 10/16/2006
 lab_id WW5540-6
 qc_type NM
 units UG/KG
 Pct_Solids 85.9
 DUP_OF:

nsample 03SD0801
 samp_date 10/16/2006
 lab_id WW5540-6
 qc_type NM
 units UG/KG
 Pct_Solids 85.9
 DUP_OF:

nsample 03SD0801
 samp_date 10/16/2006
 lab_id WW5540-6
 qc_type NM
 units UG/KG
 Pct_Solids 85.9
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	380	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	380	U	
2,4,5-TRICHLOROPHENOL	950	U	
2,4,6-TRICHLOROPHENOL	380	U	
2,4-DICHLOROPHENOL	380	U	
2,4-DIMETHYLPHENOL	380	U	
2,4-DINITROPHENOL	950	U	
2,4-DINITROTOLUENE	380	U	
2,6-DINITROTOLUENE	380	U	
2-CHLORONAPHTHALENE	380	U	
2-CHLOROPHENOL	380	U	
2-METHYLNAPHTHALENE	380	U	
2-METHYLPHENOL	380	U	
2-NITROANILINE	950	U	
2-NITROPHENOL	380	U	
3&4-METHYLPHENOL	380	U	
3,3'-DICHLOROBENZIDINE	380	U	
3-NITROANILINE	950	UR	C
4,6-DINITRO-2-METHYLPHENOL	950	U	
4-BROMOPHENYL PHENYL ETHER	380	U	
4-CHLORO-3-METHYLPHENOL	380	U	
4-CHLOROANILINE	380	U	
4-CHLOROPHENYL PHENYL ETHER	380	U	
4-NITROANILINE	950	U	
4-NITROPHENOL	950	U	
ACENAPHTHENE	380	U	
ACENAPHTHYLENE	380	U	
ACETOPHENONE	380	U	
ANTHRACENE	380	U	
ATRAZINE	380	U	
BENZALDEHYDE	380	U	
BENZO(A)ANTHRACENE	380	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	380	U	
BENZO(B)FLUORANTHENE	380	U	
BENZO(G,H,I)PERYLENE	380	U	
BENZO(K)FLUORANTHENE	380	U	
BIS(2-CHLOROETHOXY)METHANE	380	U	
BIS(2-CHLOROETHYL)ETHER	380	U	
BIS(2-ETHYLHEXYL)PHTHALATE	380	U	
BUTYL BENZYL PHTHALATE	380	U	
CAPROLACTAM	380	U	
CARBAZOLE	380	U	
CHRYSENE	380	U	
DIBENZO(A,H)ANTHRACENE	380	U	
DIBENZOFURAN	380	U	
DIETHYL PHTHALATE	380	U	
DIMETHYL PHTHALATE	380	U	
DI-N-BUTYL PHTHALATE	380	U	
DI-N-OCTYL PHTHALATE	380	U	
FLUORANTHENE	380	U	
FLUORENE	380	U	
HEXACHLOROENZENE	380	U	
HEXACHLOROBUTADIENE	380	U	
HEXACHLOROCYCLOPENTADIENE	380	U	
HEXACHLOROETHANE	380	U	
INDENO(1,2,3-CD)PYRENE	380	U	
ISOPHORONE	380	U	
NAPHTHALENE	380	U	
NITROBENZENE	380	U	
N-NITROSO-DI-N-PROPYLAMINE	380	U	
N-NITROSODIPHENYLAMINE	380	U	
PENTACHLOROPHENOL	950	U	
PHENANTHRENE	380	U	
PHENOL	380	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	380	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD0901
 samp_date 10/16/2006
 lab_id WW5540-5
 qc_type NM
 units UG/KG
 Pct_Solids 82.7
 DUP_OF:

nsample 03SD0901
 samp_date 10/16/2006
 lab_id WW5540-5
 qc_type NM
 units UG/KG
 Pct_Solids 82.7
 DUP_OF:

nsample 03SD0901
 samp_date 10/16/2006
 lab_id WW5540-5
 qc_type NM
 units UG/KG
 Pct_Solids 82.7
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	400	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	400	U	
2,4,5-TRICHLOROPHENOL	990	U	
2,4,6-TRICHLOROPHENOL	400	U	
2,4-DICHLOROPHENOL	400	U	
2,4-DIMETHYLPHENOL	400	U	
2,4-DINITROPHENOL	990	U	
2,4-DINITROTOLUENE	400	U	
2,6-DINITROTOLUENE	400	U	
2-CHLORONAPHTHALENE	400	U	
2-CHLOROPHENOL	400	U	
2-METHYLNAPHTHALENE	400	U	
2-METHYLPHENOL	400	U	
2-NITROANILINE	990	U	
2-NITROPHENOL	400	U	
3&4-METHYLPHENOL	400	U	
3,3'-DICHLOROBENZIDINE	400	U	
3-NITROANILINE	990	U	
4,6-DINITRO-2-METHYLPHENOL	990	U	
4-BROMOPHENYL PHENYL ETHER	400	U	
4-CHLORO-3-METHYLPHENOL	400	U	
4-CHLOROANILINE	400	U	
4-CHLOROPHENYL PHENYL ETHER	400	U	
4-NITROANILINE	990	U	
4-NITROPHENOL	990	U	
ACENAPHTHENE	400	U	
ACENAPHTHYLENE	400	U	
ACETOPHENONE	400	U	
ANTHRACENE	400	U	
ATRAZINE	400	U	
BENZALDEHYDE	400	U	
BENZO(A)ANTHRACENE	400	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	400	U	
BENZO(B)FLUORANTHENE	400	U	
BENZO(G,H,I)PERYLENE	400	U	
BENZO(K)FLUORANTHENE	400	U	
BIS(2-CHLOROETHOXY)METHANE	400	U	
BIS(2-CHLOROETHYL)ETHER	400	U	
BIS(2-ETHYLHEXYL)PHTHALATE	400	U	
BUTYL BENZYL PHTHALATE	400	U	
CAPROLACTAM	400	U	
CARBAZOLE	400	U	
CHRYSENE	400	U	
DIBENZO(A,H)ANTHRACENE	400	U	
DIBENZOFURAN	400	U	
DIETHYL PHTHALATE	400	U	
DIMETHYL PHTHALATE	400	U	
DI-N-BUTYL PHTHALATE	400	U	
DI-N-OCTYL PHTHALATE	400	U	
FLUORANTHENE	400	U	
FLUORENE	400	U	
HEXACHLORO BENZENE	400	U	
HEXACHLOROBUTADIENE	400	U	
HEXACHLOROCYCLOPENTADIENE	400	U	
HEXACHLOROETHANE	400	U	
INDENO(1,2,3-CD)PYRENE	400	U	
ISOPHORONE	400	U	
NAPHTHALENE	400	U	
NITROBENZENE	400	U	
N-NITROSO-DI-N-PROPYLAMINE	400	U	
N-NITROSODIPHENYLAMINE	400	U	
PENTACHLOROPHENOL	990	U	
PHENANTHRENE	400	U	
PHENOL	400	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	400	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD1001
 samp_date 10/13/2006
 lab_id WW5514-4
 qc_type NM
 units UG/KG
 Pct_Solids 54.7
 DUP_OF:

nsample 03SD1001
 samp_date 10/13/2006
 lab_id WW5514-4
 qc_type NM
 units UG/KG
 Pct_Solids 54.7
 DUP_OF:

nsample 03SD1001
 samp_date 10/13/2006
 lab_id WW5514-4
 qc_type NM
 units UG/KG
 Pct_Solids 54.7
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	600	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	600	U	
2,4,5-TRICHLOROPHENOL	1500	U	
2,4,6-TRICHLOROPHENOL	600	U	
2,4-DICHLOROPHENOL	600	U	
2,4-DIMETHYLPHENOL	600	U	
2,4-DINITROPHENOL	1500	U	
2,4-DINITROTOLUENE	600	U	
2,6-DINITROTOLUENE	600	U	
2-CHLORONAPHTHALENE	600	U	
2-CHLOROPHENOL	600	U	
2-METHYLNAPHTHALENE	600	U	
2-METHYLPHENOL	600	U	
2-NITROANILINE	1500	U	
2-NITROPHENOL	600	U	
3&4-METHYLPHENOL	600	U	
3,3'-DICHLOROBENZIDINE	600	U	
3-NITROANILINE	1500	U	
4,6-DINITRO-2-METHYLPHENOL	1500	U	
4-BROMOPHENYL PHENYL ETHER	600	U	
4-CHLORO-3-METHYLPHENOL	600	U	
4-CHLOROANILINE	600	U	
4-CHLOROPHENYL PHENYL ETHER	600	U	
4-NITROANILINE	1500	U	
4-NITROPHENOL	1500	U	
ACENAPHTHENE	600	U	
ACENAPHTHYLENE	600	U	
ACETOPHENONE	600	U	
ANTHRACENE	600	U	
ATRAZINE	600	U	
BENZALDEHYDE	600	U	
BENZO(A)ANTHRACENE	600	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	600	U	
BENZO(B)FLUORANTHENE	600	U	
BENZO(G,H,I)PERYLENE	600	U	
BENZO(K)FLUORANTHENE	600	U	
BIS(2-CHLOROETHOXY)METHANE	600	U	
BIS(2-CHLOROETHYL)ETHER	600	U	
BIS(2-ETHYLHEXYL)PHTHALATE	600	U	
BUTYL BENZYL PHTHALATE	600	U	
CAPROLACTAM	600	U	
CARBAZOLE	600	U	
CHRYSENE	600	U	
DIBENZO(A,H)ANTHRACENE	600	U	
DIBENZOFURAN	600	U	
DIETHYL PHTHALATE	600	U	
DIMETHYL PHTHALATE	600	U	
DI-N-BUTYL PHTHALATE	600	U	
DI-N-OCTYL PHTHALATE	600	U	
FLUORANTHENE	600	U	
FLUORENE	600	U	
HEXACHLOROBENZENE	600	U	
HEXACHLOROBUTADIENE	600	U	
HEXACHLOROCYCLOPENTADIENE	600	U	
HEXACHLOROETHANE	600	U	
INDENO(1,2,3-CD)PYRENE	600	U	
ISOPHORONE	600	U	
NAPHTHALENE	600	U	
NITROBENZENE	600	U	
N-NITROSO-DI-N-PROPYLAMINE	600	U	
N-NITROSODIPHENYLAMINE	600	U	
PENTACHLOROPHENOL	1500	U	
PHENANTHRENE	600	U	
PHENOL	600	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	600	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD1101
 samp_date 10/17/2006
 lab_id WW5572-1
 qc_type NM
 units UG/KG
 Pct_Solids 82.5
 DUP_OF:

nsample 03SD1101
 samp_date 10/17/2006
 lab_id WW5572-1
 qc_type NM
 units UG/KG
 Pct_Solids 82.5
 DUP_OF:

nsample 03SD1101
 samp_date 10/17/2006
 lab_id WW5572-1
 qc_type NM
 units UG/KG
 Pct_Solids 82.5
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	400	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	400	U	
2,4,5-TRICHLOROPHENOL	990	U	
2,4,6-TRICHLOROPHENOL	400	U	
2,4-DICHLOROPHENOL	400	U	
2,4-DIMETHYLPHENOL	400	U	
2,4-DINITROPHENOL	990	U	
2,4-DINITROTOLUENE	400	U	
2,6-DINITROTOLUENE	400	U	
2-CHLORONAPHTHALENE	400	U	
2-CHLOROPHENOL	400	U	
2-METHYLNAPHTHALENE	400	U	
2-METHYLPHENOL	400	U	
2-NITROANILINE	990	U	
2-NITROPHENOL	400	U	
3&4-METHYLPHENOL	400	U	
3,3'-DICHLOROBENZIDINE	400	U	
3-NITROANILINE	990	UR	C
4,6-DINITRO-2-METHYLPHENOL	990	U	
4-BROMOPHENYL PHENYL ETHER	400	U	
4-CHLORO-3-METHYLPHENOL	400	U	
4-CHLOROANILINE	400	U	
4-CHLOROPHENYL PHENYL ETHER	400	U	
4-NITROANILINE	990	U	
4-NITROPHENOL	990	U	
ACENAPHTHENE	400	U	
ACENAPHTHYLENE	400	U	
ACETOPHENONE	400	U	
ANTHRACENE	400	U	
ATRAZINE	400	U	
BENZALDEHYDE	400	U	
BENZO(A)ANTHRACENE	400	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	400	U	
BENZO(B)FLUORANTHENE	400	U	
BENZO(G,H,I)PERYLENE	400	U	
BENZO(K)FLUORANTHENE	400	U	
BIS(2-CHLOROETHOXY)METHANE	400	U	
BIS(2-CHLOROETHYL)ETHER	400	U	
BIS(2-ETHYLHEXYL)PHTHALATE	400	U	
BUTYL BENZYL PHTHALATE	400	U	
CAPROLACTAM	400	U	
CARBAZOLE	400	U	
CHRYSENE	400	U	
DIBENZO(A,H)ANTHRACENE	400	U	
DIBENZOFURAN	400	U	
DIETHYL PHTHALATE	400	U	
DIMETHYL PHTHALATE	400	U	
DI-N-BUTYL PHTHALATE	400	U	
DI-N-OCTYL PHTHALATE	400	U	
FLUORANTHENE	400	U	
FLUORENE	400	U	
HEXACHLOROENZENE	400	U	
HEXACHLOROBUTADIENE	400	U	
HEXACHLOROCYCLOPENTADIENE	400	U	
HEXACHLOROETHANE	400	U	
INDENO(1,2,3-CD)PYRENE	400	U	
ISOPHORONE	400	U	
NAPHTHALENE	400	U	
NITROBENZENE	400	U	
N-NITROSO-DI-N-PROPYLAMINE	400	U	
N-NITROSODIPHENYLAMINE	400	U	
PENTACHLOROPHENOL	990	U	
PHENANTHRENE	400	U	
PHENOL	400	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	400	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD1201
 samp_date 10/17/2006
 lab_id WW5572-2
 qc_type NM
 units UG/KG
 Pct_Solids 83.0
 DUP_OF:

nsample 03SD1201
 samp_date 10/17/2006
 lab_id WW5572-2
 qc_type NM
 units UG/KG
 Pct_Solids 83.0
 DUP_OF:

nsample 03SD1201
 samp_date 10/17/2006
 lab_id WW5572-2
 qc_type NM
 units UG/KG
 Pct_Solids 83.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	400	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	400	U	
2,4,5-TRICHLOROPHENOL	990	U	
2,4,6-TRICHLOROPHENOL	400	U	
2,4-DICHLOROPHENOL	400	U	
2,4-DIMETHYLPHENOL	400	U	
2,4-DINITROPHENOL	990	U	
2,4-DINITROTOLUENE	400	U	
2,6-DINITROTOLUENE	400	U	
2-CHLORONAPHTHALENE	400	U	
2-CHLOROPHENOL	400	U	
2-METHYLNAPHTHALENE	400	U	
2-METHYLPHENOL	400	U	
2-NITROANILINE	990	U	
2-NITROPHENOL	400	U	
3&4-METHYLPHENOL	400	U	
3,3'-DICHLOROBENZIDINE	400	U	
3-NITROANILINE	990	UR	C
4,6-DINITRO-2-METHYLPHENOL	990	U	
4-BROMOPHENYL PHENYL ETHER	400	U	
4-CHLORO-3-METHYLPHENOL	400	U	
4-CHLOROANILINE	400	U	
4-CHLOROPHENYL PHENYL ETHER	400	U	
4-NITROANILINE	990	U	
4-NITROPHENOL	990	U	
ACENAPHTHENE	400	U	
ACENAPHTHYLENE	400	U	
ACETOPHENONE	400	U	
ANTHRACENE	400	U	
ATRAZINE	400	U	
BENZALDEHYDE	400	U	
BENZO(A)ANTHRACENE	400	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	400	U	
BENZO(B)FLUORANTHENE	400	U	
BENZO(G,H,I)PERYLENE	400	U	
BENZO(K)FLUORANTHENE	400	U	
BIS(2-CHLOROETHOXY)METHANE	400	U	
BIS(2-CHLOROETHYL)ETHER	400	U	
BIS(2-ETHYLHEXYL)PHTHALATE	400	U	
BUTYL BENZYL PHTHALATE	400	U	
CAPROLACTAM	400	U	
CARBAZOLE	400	U	
CHRYSENE	400	U	
DIBENZO(A,H)ANTHRACENE	400	U	
DIBENZOFURAN	400	U	
DIETHYL PHTHALATE	400	U	
DIMETHYL PHTHALATE	400	U	
DI-N-BUTYL PHTHALATE	400	U	
DI-N-OCTYL PHTHALATE	400	U	
FLUORANTHENE	400	U	
FLUORENE	400	U	
HEXACHLOROBENZENE	400	U	
HEXACHLOROBUTADIENE	400	U	
HEXACHLOROCYCLOPENTADIENE	400	U	
HEXACHLOROETHANE	400	U	
INDENO(1,2,3-CD)PYRENE	400	U	
ISOPHORONE	400	U	
NAPHTHALENE	400	U	
NITROBENZENE	400	U	
N-NITROSO-DI-N-PROPYLAMINE	400	U	
N-NITROSODIPHENYLAMINE	400	U	
PENTACHLOROPHENOL	990	U	
PHENANTHRENE	400	U	
PHENOL	400	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	400	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD1301
 samp_date 10/16/2006
 lab_id WW5540-4
 qc_type NM
 units UG/KG
 Pct_Solids 74.3
 DUP_OF:

nsample 03SD1301
 samp_date 10/16/2006
 lab_id WW5540-4
 qc_type NM
 units UG/KG
 Pct_Solids 74.3
 DUP_OF:

nsample 03SD1301
 samp_date 10/16/2006
 lab_id WW5540-4
 qc_type NM
 units UG/KG
 Pct_Solids 74.3
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	440	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	440	U	
2,4,5-TRICHLOROPHENOL	1100	U	
2,4,6-TRICHLOROPHENOL	440	U	
2,4-DICHLOROPHENOL	440	U	
2,4-DIMETHYLPHENOL	440	U	
2,4-DINITROPHENOL	1100	U	
2,4-DINITROTOLUENE	440	U	
2,6-DINITROTOLUENE	440	U	
2-CHLORONAPHTHALENE	440	U	
2-CHLOROPHENOL	440	U	
2-METHYLNAPHTHALENE	440	U	
2-METHYLPHENOL	440	U	
2-NITROANILINE	1100	U	
2-NITROPHENOL	440	U	
3&4-METHYLPHENOL	440	U	
3,3'-DICHLOROBENZIDINE	440	U	
3-NITROANILINE	1100	U	
4,6-DINITRO-2-METHYLPHENOL	1100	U	
4-BROMOPHENYL PHENYL ETHER	440	U	
4-CHLORO-3-METHYLPHENOL	440	U	
4-CHLOROANILINE	440	U	
4-CHLOROPHENYL PHENYL ETHER	440	U	
4-NITROANILINE	1100	U	
4-NITROPHENOL	1100	U	
ACENAPHTHENE	440	U	
ACENAPHTHYLENE	440	U	
ACETOPHENONE	440	U	
ANTHRACENE	440	U	
ATRAZINE	440	U	
BENZALDEHYDE	440	U	
BENZO(A)ANTHRACENE	440	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	440	U	
BENZO(B)FLUORANTHENE	440	U	
BENZO(G,H,I)PERYLENE	440	U	
BENZO(K)FLUORANTHENE	440	U	
BIS(2-CHLOROETHOXY)METHANE	440	U	
BIS(2-CHLOROETHYL)ETHER	440	U	
BIS(2-ETHYLHEXYL)PHTHALATE	440	U	
BUTYL BENZYL PHTHALATE	440	U	
CAPROLACTAM	440	U	
CARBAZOLE	440	U	
CHRYSENE	440	U	
DIBENZO(A,H)ANTHRACENE	440	U	
DIBENZOFURAN	440	U	
DIETHYL PHTHALATE	440	U	
DIMETHYL PHTHALATE	440	U	
DI-N-BUTYL PHTHALATE	440	U	
DI-N-OCTYL PHTHALATE	440	U	
FLUORANTHENE	440	U	
FLUORENE	440	U	
HEXACHLOROBENZENE	440	U	
HEXACHLOROBUTADIENE	440	U	
HEXACHLOROCYCLOPENTADIENE	440	U	
HEXACHLOROETHANE	440	U	
INDENO(1,2,3-CD)PYRENE	440	U	
ISOPHORONE	440	U	
NAPHTHALENE	440	U	
NITROBENZENE	440	U	
N-NITROSO-DI-N-PROPYLAMINE	440	U	
N-NITROSODIPHENYLAMINE	440	U	
PENTACHLOROPHENOL	1100	U	
PHENANTHRENE	440	U	
PHENOL	440	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	440	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD1401
 samp_date 10/16/2006
 lab_id WW5540-3
 qc_type NM
 units UG/KG
 Pct_Solids 79.4
 DUP_OF:

nsample 03SD1401
 samp_date 10/16/2006
 lab_id WW5540-3
 qc_type NM
 units UG/KG
 Pct_Solids 79.4
 DUP_OF:

nsample 03SD1401
 samp_date 10/16/2006
 lab_id WW5540-3
 qc_type NM
 units UG/KG
 Pct_Solids 79.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	420	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	420	U	
2,4,5-TRICHLOROPHENOL	1000	U	
2,4,6-TRICHLOROPHENOL	420	U	
2,4-DICHLOROPHENOL	420	U	
2,4-DIMETHYLPHENOL	420	U	
2,4-DINITROPHENOL	1000	U	
2,4-DINITROTOLUENE	420	U	
2,6-DINITROTOLUENE	420	U	
2-CHLORONAPHTHALENE	420	U	
2-CHLOROPHENOL	420	U	
2-METHYLNAPHTHALENE	420	U	
2-METHYLPHENOL	420	U	
2-NITROANILINE	1000	U	
2-NITROPHENOL	420	U	
3&4-METHYLPHENOL	420	U	
3,3'-DICHLOROBENZIDINE	420	U	
3-NITROANILINE	1000	U	
4,6-DINITRO-2-METHYLPHENOL	1000	U	
4-BROMOPHENYL PHENYL ETHER	420	U	
4-CHLORO-3-METHYLPHENOL	420	U	
4-CHLOROANILINE	420	U	
4-CHLOROPHENYL PHENYL ETHER	420	U	
4-NITROANILINE	1000	U	
4-NITROPHENOL	1000	U	
ACENAPHTHENE	420	U	
ACENAPHTHYLENE	420	U	
ACETOPHENONE	420	U	
ANTHRACENE	420	U	
ATRAZINE	420	U	
BENZALDEHYDE	420	U	
BENZO(A)ANTHRACENE	420	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	420	U	
BENZO(B)FLUORANTHENE	420	U	
BENZO(G,H,I)PERYLENE	420	U	
BENZO(K)FLUORANTHENE	420	U	
BIS(2-CHLOROETHOXY)METHANE	420	U	
BIS(2-CHLOROETHYL)ETHER	420	U	
BIS(2-ETHYLHEXYL)PHTHALATE	420	U	
BUTYL BENZYL PHTHALATE	420	U	
CAPROLACTAM	420	U	
CARBAZOLE	420	U	
CHRYSENE	420	U	
DIBENZO(A,H)ANTHRACENE	420	U	
DIBENZOFURAN	420	U	
DIETHYL PHTHALATE	420	U	
DIMETHYL PHTHALATE	420	U	
DI-N-BUTYL PHTHALATE	420	U	
DI-N-OCTYL PHTHALATE	420	U	
FLUORANTHENE	420	U	
FLUORENE	420	U	
HEXACHLOROBENZENE	420	U	
HEXACHLOROBUTADIENE	420	U	
HEXACHLOROCYCLOPENTADIENE	420	U	
HEXACHLOROETHANE	420	U	
INDENO(1,2,3-CD)PYRENE	420	U	
ISOPHORONE	420	U	
NAPHTHALENE	420	U	
NITROBENZENE	420	U	
N-NITROSO-DI-N-PROPYLAMINE	420	U	
N-NITROSODIPHENYLAMINE	420	U	
PENTACHLOROPHENOL	1000	U	
PHENANTHRENE	420	U	
PHENOL	420	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	420	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD1501
 samp_date 10/16/2006
 lab_id WW5540-2
 qc_type NM
 units UG/KG
 Pct_Solids 79.0
 DUP_OF:

nsample 03SD1501
 samp_date 10/16/2006
 lab_id WW5540-2
 qc_type NM
 units UG/KG
 Pct_Solids 79.0
 DUP_OF:

nsample 03SD1501
 samp_date 10/16/2006
 lab_id WW5540-2
 qc_type NM
 units UG/KG
 Pct_Solids 79.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	420	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	420	U	
2,4,5-TRICHLOROPHENOL	1000	U	
2,4,6-TRICHLOROPHENOL	420	U	
2,4-DICHLOROPHENOL	420	U	
2,4-DIMETHYLPHENOL	420	U	
2,4-DINITROPHENOL	1000	U	
2,4-DINITROTOLUENE	420	U	
2,6-DINITROTOLUENE	420	U	
2-CHLORONAPHTHALENE	420	U	
2-CHLOROPHENOL	420	U	
2-METHYLNAPHTHALENE	420	U	
2-METHYLPHENOL	420	U	
2-NITROANILINE	1000	U	
2-NITROPHENOL	420	U	
3&4-METHYLPHENOL	420	U	
3,3'-DICHLOROBENZIDINE	420	U	
3-NITROANILINE	1000	U	
4,6-DINITRO-2-METHYLPHENOL	1000	U	
4-BROMOPHENYL PHENYL ETHER	420	U	
4-CHLORO-3-METHYLPHENOL	420	U	
4-CHLOROANILINE	420	U	
4-CHLOROPHENYL PHENYL ETHER	420	U	
4-NITROANILINE	1000	U	
4-NITROPHENOL	1000	U	
ACENAPHTHENE	420	U	
ACENAPHTHYLENE	420	U	
ACETOPHENONE	420	U	
ANTHRACENE	420	U	
ATRAZINE	420	U	
BENZALDEHYDE	420	U	
BENZO(A)ANTHRACENE	420	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	420	U	
BENZO(B)FLUORANTHENE	420	U	
BENZO(G,H,I)PERYLENE	420	U	
BENZO(K)FLUORANTHENE	420	U	
BIS(2-CHLOROETHOXY)METHANE	420	U	
BIS(2-CHLOROETHYL)ETHER	420	U	
BIS(2-ETHYLHEXYL)PHTHALATE	420	U	
BUTYL BENZYL PHTHALATE	420	U	
CAPROLACTAM	420	U	
CARBAZOLE	420	U	
CHRYSENE	420	U	
DIBENZO(A,H)ANTHRACENE	420	U	
DIBENZOFURAN	420	U	
DIETHYL PHTHALATE	420	U	
DIMETHYL PHTHALATE	420	U	
DI-N-BUTYL PHTHALATE	420	U	
DI-N-OCTYL PHTHALATE	420	U	
FLUORANTHENE	420	U	
FLUORENE	420	U	
HEXACHLOROENZENE	420	U	
HEXACHLOROBUTADIENE	420	U	
HEXACHLOROCYCLOPENTADIENE	420	U	
HEXACHLOROETHANE	420	U	
INDENO(1,2,3-CD)PYRENE	420	U	
ISOPHORONE	420	U	
NAPHTHALENE	420	U	
NITROBENZENE	420	U	
N-NITROSO-DI-N-PROPYLAMINE	420	U	
N-NITROSODIPHENYLAMINE	420	U	
PENTACHLOROPHENOL	1000	U	
PHENANTHRENE	420	U	
PHENOL	420	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	420	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: OS

nsample 03SD1601
 samp_date 10/16/2006
 lab_id WW5540-1
 qc_type NM
 units UG/KG
 Pct_Solids 76.0
 DUP_OF:

nsample 03SD1601
 samp_date 10/16/2006
 lab_id WW5540-1
 qc_type NM
 units UG/KG
 Pct_Solids 76.0
 DUP_OF:

nsample 03SD1601
 samp_date 10/16/2006
 lab_id WW5540-1
 qc_type NM
 units UG/KG
 Pct_Solids 76.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	430	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	430	U	
2,4,5-TRICHLOROPHENOL	1100	U	
2,4,6-TRICHLOROPHENOL	430	U	
2,4-DICHLOROPHENOL	430	U	
2,4-DIMETHYLPHENOL	430	U	
2,4-DINITROPHENOL	1100	U	
2,4-DINITROTOLUENE	430	U	
2,6-DINITROTOLUENE	430	U	
2-CHLORONAPHTHALENE	430	U	
2-CHLOROPHENOL	430	U	
2-METHYLNAPHTHALENE	430	U	
2-METHYLPHENOL	430	U	
2-NITROANILINE	1100	U	
2-NITROPHENOL	430	U	
3&4-METHYLPHENOL	430	U	
3,3'-DICHLOROBENZIDINE	430	U	
3-NITROANILINE	1100	U	
4,6-DINITRO-2-METHYLPHENOL	1100	U	
4-BROMOPHENYL PHENYL ETHER	430	U	
4-CHLORO-3-METHYLPHENOL	430	U	
4-CHLOROANILINE	430	U	
4-CHLOROPHENYL PHENYL ETHER	430	U	
4-NITROANILINE	1100	U	
4-NITROPHENOL	1100	U	
ACENAPHTHENE	430	U	
ACENAPHTHYLENE	430	U	
ACETOPHENONE	430	U	
ANTHRACENE	430	U	
ATRAZINE	430	U	
BENZALDEHYDE	430	U	
BENZO(A)ANTHRACENE	430	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)PYRENE	430	U	
BENZO(B)FLUORANTHENE	430	U	
BENZO(G,H,I)PERYLENE	430	U	
BENZO(K)FLUORANTHENE	430	U	
BIS(2-CHLOROETHOXY)METHANE	430	U	
BIS(2-CHLOROETHYL)ETHER	430	U	
BIS(2-ETHYLHEXYL)PHTHALATE	430	U	
BUTYL BENZYL PHTHALATE	430	U	
CAPROLACTAM	430	U	
CARBAZOLE	430	U	
CHRYSENE	430	U	
DIBENZO(A,H)ANTHRACENE	430	U	
DIBENZOFURAN	430	U	
DIETHYL PHTHALATE	430	U	
DIMETHYL PHTHALATE	430	U	
DI-N-BUTYL PHTHALATE	430	U	
DI-N-OCTYL PHTHALATE	430	U	
FLUORANTHENE	430	U	
FLUORENE	430	U	
HEXACHLOROENZENE	430	U	
HEXACHLOROBUTADIENE	430	U	
HEXACHLOROCYCLOPENTADIENE	430	U	
HEXACHLOROETHANE	430	U	
INDENO(1,2,3-CD)PYRENE	430	U	
ISOPHORONE	430	U	
NAPHTHALENE	430	U	
NITROBENZENE	430	U	
N-NITROSO-DI-N-PROPYLAMINE	430	U	
N-NITROSODIPHENYLAMINE	430	U	
PENTACHLOROPHENOL	1100	U	
PHENANTHRENE	430	U	
PHENOL	430	U	

Parameter	Result	Val Qual	Qual Code
PYRENE	430	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 03SD0101
 samp_date 10/12/2006
 lab_id WW5492-5
 qc_type NM
 units UG/KG
 Pct_Solids 66.6
 DUP_OF:

nsample 03SD0101RA
 samp_date 10/12/2006
 lab_id WW5492-5RA
 qc_type NM
 units UG/KG
 Pct_Solids 66.6
 DUP_OF:

nsample 03SD0201
 samp_date 10/12/2006
 lab_id WW5492-4
 qc_type NM
 units UG/KG
 Pct_Solids 64.6
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	5	U	
4,4'-DDE	3.7	J	P
4,4'-DDT	9.8		
ALDRIN	2.6	U	
ALPHA-BHC	2.6	U	
ALPHA-CHLORDANE	2.6	U	
BETA-BHC	2.6	U	
DELTA-BHC	2.6	U	
DIELDRIN	5	U	
ENDOSULFAN I	2.6	U	
ENDOSULFAN II	5	U	
ENDOSULFAN SULFATE	5	U	
ENDRIN	5	U	
ENDRIN ALDEHYDE	5	U	
ENDRIN KETONE	3.2	J	P
GAMMA-BHC (LINDANE)	2.6	U	
GAMMA-CHLORDANE	2.6	U	
HEPTACHLOR	2.6	U	
HEPTACHLOR EPOXIDE	2.6	U	
METHOXYCHLOR	26	U	
TOXAPHENE	50	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	26	U	
AROCLOR-1221	26	U	
AROCLOR-1232	26	U	
AROCLOR-1242	26	U	
AROCLOR-1248	26	U	
AROCLOR-1254	86		
AROCLOR-1260	130		

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	3.1	J	P
4,4'-DDE	1.6	J	P
4,4'-DDT	4.4	J	P
ALDRIN	2.6	U	
ALPHA-BHC	2.6	U	
ALPHA-CHLORDANE	2.6	U	
BETA-BHC	2.6	U	
DELTA-BHC	2.6	U	
DIELDRIN	2.8	J	P
ENDOSULFAN I	2.6	U	
ENDOSULFAN II	5.1	U	
ENDOSULFAN SULFATE	5.1	U	
ENDRIN	5.1	U	
ENDRIN ALDEHYDE	5.1	U	
ENDRIN KETONE	5.1	U	
GAMMA-BHC (LINDANE)	2	J	P
GAMMA-CHLORDANE	2.6	U	
HEPTACHLOR	2.6	U	
HEPTACHLOR EPOXIDE	2.6	U	
METHOXYCHLOR	26	U	
TOXAPHENE	51	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 03SD0201RA
 samp_date 10/12/2006
 lab_id WW5492-4RA
 qc_type NM
 units UG/KG
 Pct_Solids 64.6
 DUP_OF:

nsample 03SD0301
 samp_date 10/12/2006
 lab_id WW5492-3
 qc_type NM
 units UG/KG
 Pct_Solids 78.5
 DUP_OF:

nsample 03SD0301RA
 samp_date 10/12/2006
 lab_id WW5492-3RA
 qc_type NM
 units UG/KG
 Pct_Solids 78.5
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	26	U	
AROCLOR-1221	26	U	
AROCLOR-1232	26	U	
AROCLOR-1242	26	U	
AROCLOR-1248	26	U	
AROCLOR-1254	26	U	
AROCLOR-1260	56		

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	1.7	J	P
4,4'-DDE	4.2	U	
4,4'-DDT	4.2	U	
ALDRIN	2.2	U	
ALPHA-BHC	2.2	U	
ALPHA-CHLORDANE	2.2	U	
BETA-BHC	2.2	U	
DELTA-BHC	2.2	U	
ENDOSULFAN I	2.2	U	
ENDOSULFAN SULFATE	4.2	U	
ENDRIN KETONE	4.2	U	
GAMMA-BHC (LINDANE)	2.2	U	
GAMMA-CHLORDANE	2.2	U	
HEPTACHLOR	2.2	U	
HEPTACHLOR EPOXIDE	2.2	U	
TOXAPHENE	42	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	22	U	
AROCLOR-1221	22	U	
AROCLOR-1232	22	U	
AROCLOR-1242	22	U	
AROCLOR-1248	22	U	
AROCLOR-1254	22	U	
AROCLOR-1260	22	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 03SD0301RE
 samp_date 10/12/2006
 lab_id WW5492-3RE
 qc_type NM
 units UG/KG
 Pct_Solids 78.5
 DUP_OF:

nsample 03SD0401
 samp_date 10/12/2006
 lab_id WW5492-2
 qc_type NM
 units UG/KG
 Pct_Solids 59.1
 DUP_OF:

nsample 03SD0401RA
 samp_date 10/12/2006
 lab_id WW5492-2RA
 qc_type NM
 units UG/KG
 Pct_Solids 59.1
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DIELDRIN	4.2	UR	H
ENDOSULFAN II	4.2	UR	H
ENDRIN	4.2	UR	H
ENDRIN ALDEHYDE	4.2	UR	H
METHOXYCHLOR	22	UR	H

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	5.6	U	
4,4'-DDE	2.9	J	P
4,4'-DDT	4.4	J	P
ALDRIN	2.9	U	
ALPHA-BHC	2.9	U	
ALPHA-CHLORDANE	2.2	J	P
BETA-BHC	2.9	U	
DELTA-BHC	2.9	U	
DIELDRIN	2.6	J	P
ENDOSULFAN I	2.9	U	
ENDOSULFAN II	5.6	U	
ENDOSULFAN SULFATE	5.6	U	
ENDRIN	5.6	U	
ENDRIN ALDEHYDE	5.6	U	
ENDRIN KETONE	5.6	U	
GAMMA-BHC (LINDANE)	2.9	U	
GAMMA-CHLORDANE	2	J	P
HEPTACHLOR	2.9	U	
HEPTACHLOR EPOXIDE	2.9	U	
METHOXYCHLOR	29	U	
TOXAPHENE	56	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	29	U	
AROCLOR-1221	29	U	
AROCLOR-1232	29	U	
AROCLOR-1242	29	U	
AROCLOR-1248	29	U	
AROCLOR-1254	49		
AROCLOR-1260	42		

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 03SD0501
 samp_date 10/12/2006
 lab_id WW5492-1
 qc_type NM
 units UG/KG
 Pct_Solids 70.7
 DUP_OF:

nsample 03SD0501RA
 samp_date 10/12/2006
 lab_id WW5492-1RA
 qc_type NM
 units UG/KG
 Pct_Solids 70.7
 DUP_OF:

nsample 03SD0601
 samp_date 10/13/2006
 lab_id WW5514-1
 qc_type NM
 units UG/KG
 Pct_Solids 77.6
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	4.7	U	
4,4'-DDE	4.7	U	
4,4'-DDT	4.7	U	
ALDRIN	2.4	U	
ALPHA-BHC	2.4	U	
ALPHA-CHLORDANE	2.4	U	
BETA-BHC	2.4	U	
DELTA-BHC	2.4	U	
DIELDRIN	4.7	U	
ENDOSULFAN I	2.4	U	
ENDOSULFAN II	4.7	U	
ENDOSULFAN SULFATE	4.7	U	
ENDRIN	4.7	U	
ENDRIN ALDEHYDE	4.7	U	
ENDRIN KETONE	4.7	U	
GAMMA-BHC (LINDANE)	2.4	U	
GAMMA-CHLORDANE	2.4	U	
HEPTACHLOR	2.4	U	
HEPTACHLOR EPOXIDE	2.4	U	
METHOXYCHLOR	24	U	
TOXAPHENE	47	U	

Parameter	Result	Val Qual	Qual Code
AROCLOR-1016	24	U	
AROCLOR-1221	24	U	
AROCLOR-1232	24	U	
AROCLOR-1242	24	U	
AROCLOR-1248	24	U	
AROCLOR-1254	35		
AROCLOR-1260	32		

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	4.2	U	
4,4'-DDE	1.4	J	P
4,4'-DDT	4.2	U	
ALDRIN	2.2	U	
ALPHA-BHC	1.9	J	P
ALPHA-CHLORDANE	2.4		
AROCLOR-1016	22	U	
AROCLOR-1221	22	U	
AROCLOR-1232	22	U	
AROCLOR-1242	22	U	
AROCLOR-1248	22	U	
AROCLOR-1254	22	U	
AROCLOR-1260	22	U	
BETA-BHC	2.2	U	
DELTA-BHC	2.2	U	
DIELDRIN	4.2	U	
ENDOSULFAN I	2.2	U	
ENDOSULFAN II	4.2	U	
ENDOSULFAN SULFATE	4.2	U	
ENDRIN	4.2	U	
ENDRIN ALDEHYDE	4.2	U	
ENDRIN KETONE	4.2	U	
GAMMA-BHC (LINDANE)	2.2	U	
GAMMA-CHLORDANE	1.5	J	P
HEPTACHLOR	2.2	U	
HEPTACHLOR EPOXIDE	2.2	U	
METHOXYCHLOR	22	U	
TOXAPHENE	42	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 03SD0601D
 samp_date 10/13/2006
 lab_id WW5514-2
 qc_type NM
 units UG/KG
 Pct_Solids 70.8
 DUP_OF: 03SD0601

nsample 03SD0701
 samp_date 10/13/2006
 lab_id WW5514-3
 qc_type NM
 units UG/KG
 Pct_Solids 83.4
 DUP_OF:

nsample 03SD0801
 samp_date 10/16/2006
 lab_id WW5540-6
 qc_type NM
 units UG/KG
 Pct_Solids 85.9
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	1.9	J	P
4,4'-DDE	1.4	J	P
4,4'-DDT	4.6	U	
ALDRIN	2.4	U	
ALPHA-BHC	2.1	J	P
ALPHA-CHLORDANE	3.3		
AROCLOR-1016	24	U	
AROCLOR-1221	24	U	
AROCLOR-1232	24	U	
AROCLOR-1242	24	U	
AROCLOR-1248	24	U	
AROCLOR-1254	24	U	
AROCLOR-1260	24	U	
BETA-BHC	2.4	U	
DELTA-BHC	2.4	U	
DIELDRIN	1.9	J	P
ENDOSULFAN I	2.4	U	
ENDOSULFAN II	4.6	U	
ENDOSULFAN SULFATE	4.6	U	
ENDRIN	4.6	U	
ENDRIN ALDEHYDE	4.6	U	
ENDRIN KETONE	4.6	U	
GAMMA-BHC (LINDANE)	2.4	U	
GAMMA-CHLORDANE	2.1	J	P
HEPTACHLOR	2.4	U	
HEPTACHLOR EPOXIDE	2.4	U	
METHOXYCHLOR	24	U	
TOXAPHENE	46	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	4	U	
4,4'-DDE	4	U	
4,4'-DDT	4	U	
ALDRIN	2	U	
ALPHA-BHC	2	U	
ALPHA-CHLORDANE	2	U	
AROCLOR-1016	20	U	
AROCLOR-1221	20	U	
AROCLOR-1232	20	U	
AROCLOR-1242	20	U	
AROCLOR-1248	20	U	
AROCLOR-1254	20	U	
AROCLOR-1260	20	U	
BETA-BHC	2	U	
DELTA-BHC	2	U	
DIELDRIN	4	U	
ENDOSULFAN I	2	U	
ENDOSULFAN II	4	U	
ENDOSULFAN SULFATE	4	U	
ENDRIN	4	U	
ENDRIN ALDEHYDE	4	U	
ENDRIN KETONE	4	U	
GAMMA-BHC (LINDANE)	2	U	
GAMMA-CHLORDANE	2	U	
HEPTACHLOR	2	U	
HEPTACHLOR EPOXIDE	2	U	
METHOXYCHLOR	20	U	
TOXAPHENE	40	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	3.8	U	
4,4'-DDE	3.8	U	
4,4'-DDT	3.8	U	
ALDRIN	2	U	
ALPHA-BHC	2	U	
ALPHA-CHLORDANE	2	U	
AROCLOR-1016	20	U	
AROCLOR-1221	20	U	
AROCLOR-1232	20	U	
AROCLOR-1242	20	U	
AROCLOR-1248	20	U	
AROCLOR-1254	20	U	
AROCLOR-1260	20	U	
BETA-BHC	2	U	
DELTA-BHC	2	U	
DIELDRIN	3.8	U	
ENDOSULFAN I	2	U	
ENDOSULFAN II	3.8	U	
ENDOSULFAN SULFATE	3.8	U	
ENDRIN	3.8	U	
ENDRIN ALDEHYDE	3.8	U	
ENDRIN KETONE	3.8	U	
GAMMA-BHC (LINDANE)	2	U	
GAMMA-CHLORDANE	2	U	
HEPTACHLOR	2	U	
HEPTACHLOR EPOXIDE	2	U	
METHOXYCHLOR	20	U	
TOXAPHENE	38	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 03SD0901
 samp_date 10/16/2006
 lab_id WW5540-5
 qc_type NM
 units UG/KG
 Pct_Solids 82.7
 DUP_OF:

nsample 03SD1001
 samp_date 10/13/2006
 lab_id WW5514-4
 qc_type NM
 units UG/KG
 Pct_Solids 54.7
 DUP_OF:

nsample 03SD1101
 samp_date 10/17/2006
 lab_id WW5572-1
 qc_type NM
 units UG/KG
 Pct_Solids 82.5
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	4	U	
4,4'-DDE	4	U	
4,4'-DDT	4	U	
ALDRIN	2	U	
ALPHA-BHC	2	U	
ALPHA-CHLORDANE	2	U	
AROCLOR-1016	20	U	
AROCLOR-1221	20	U	
AROCLOR-1232	20	U	
AROCLOR-1242	20	U	
AROCLOR-1248	20	U	
AROCLOR-1254	20	U	
AROCLOR-1260	20	U	
BETA-BHC	2	U	
DELTA-BHC	2	J	P
DIELDRIN	4	U	
ENDOSULFAN I	2	U	
ENDOSULFAN II	4	U	
ENDOSULFAN SULFATE	4	U	
ENDRIN	4	U	
ENDRIN ALDEHYDE	4	U	
ENDRIN KETONE	4	U	
GAMMA-BHC (LINDANE)	2	U	
GAMMA-CHLORDANE	2	U	
HEPTACHLOR	2	U	
HEPTACHLOR EPOXIDE	2	U	
METHOXYCHLOR	20	U	
TOXAPHENE	40	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	6	U	
4,4'-DDE	6	U	
4,4'-DDT	6	U	
ALDRIN	3.1	U	
ALPHA-BHC	3.1	U	
ALPHA-CHLORDANE	3.1	U	
AROCLOR-1016	31	U	
AROCLOR-1221	31	U	
AROCLOR-1232	31	U	
AROCLOR-1242	31	U	
AROCLOR-1248	31	U	
AROCLOR-1254	31	U	
AROCLOR-1260	31	U	
BETA-BHC	3.1	U	
DELTA-BHC	2.4	J	P
DIELDRIN	6	U	
ENDOSULFAN I	3.1	U	
ENDOSULFAN II	6	U	
ENDOSULFAN SULFATE	6	U	
ENDRIN	6	U	
ENDRIN ALDEHYDE	6	U	
ENDRIN KETONE	2.8	J	P
GAMMA-BHC (LINDANE)	2.3	J	P
GAMMA-CHLORDANE	3.1	U	
HEPTACHLOR	3.1	U	
HEPTACHLOR EPOXIDE	3.1	U	
METHOXYCHLOR	31	U	
TOXAPHENE	60	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	4	U	
4,4'-DDE	4	U	
4,4'-DDT	4	U	
ALDRIN	2	U	
ALPHA-BHC	2	U	
ALPHA-CHLORDANE	2	U	
AROCLOR-1016	20	U	
AROCLOR-1221	20	U	
AROCLOR-1232	20	U	
AROCLOR-1242	20	U	
AROCLOR-1248	20	U	
AROCLOR-1254	20	U	
AROCLOR-1260	20	U	
BETA-BHC	2	U	
DELTA-BHC	2	U	
DIELDRIN	4	U	
ENDOSULFAN I	2	U	
ENDOSULFAN II	4	U	
ENDOSULFAN SULFATE	4	U	
ENDRIN	4	U	
ENDRIN ALDEHYDE	4	U	
ENDRIN KETONE	4	U	
GAMMA-BHC (LINDANE)	2	U	
GAMMA-CHLORDANE	2	U	
HEPTACHLOR	2	U	
HEPTACHLOR EPOXIDE	2	U	
METHOXYCHLOR	20	U	
TOXAPHENE	40	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 03SD1201
 samp_date 10/17/2006
 lab_id WW5572-2
 qc_type NM
 units UG/KG
 Pct_Solids 83.0
 DUP_OF:

nsample 03SD1301
 samp_date 10/16/2006
 lab_id WW5540-4
 qc_type NM
 units UG/KG
 Pct_Solids 74.3
 DUP_OF:

nsample 03SD1401
 samp_date 10/16/2006
 lab_id WW5540-3
 qc_type NM
 units UG/KG
 Pct_Solids 79.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	4	U	
4,4'-DDE	4	U	
4,4'-DDT	4	U	
ALDRIN	2	U	
ALPHA-BHC	2	U	
ALPHA-CHLORDANE	2	U	
AROCLOR-1016	20	U	
AROCLOR-1221	20	U	
AROCLOR-1232	20	U	
AROCLOR-1242	20	U	
AROCLOR-1248	20	U	
AROCLOR-1254	20	U	
AROCLOR-1260	20	U	
BETA-BHC	2	U	
DELTA-BHC	2	U	
DIELDRIN	4	U	
ENDOSULFAN I	2	U	
ENDOSULFAN II	4	U	
ENDOSULFAN SULFATE	4	U	
ENDRIN	4	U	
ENDRIN ALDEHYDE	4	U	
ENDRIN KETONE	4	U	
GAMMA-BHC (LINDANE)	2	U	
GAMMA-CHLORDANE	2	U	
HEPTACHLOR	2	U	
HEPTACHLOR EPOXIDE	2	U	
METHOXYCHLOR	20	U	
TOXAPHENE	40	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	4.4	U	
4,4'-DDE	4.4	U	
4,4'-DDT	4.4	U	
ALDRIN	2.3	U	
ALPHA-BHC	2.3	U	
ALPHA-CHLORDANE	2.3	U	
AROCLOR-1016	23	U	
AROCLOR-1221	23	U	
AROCLOR-1232	23	U	
AROCLOR-1242	23	U	
AROCLOR-1248	23	U	
AROCLOR-1254	23	U	
AROCLOR-1260	23	U	
BETA-BHC	2.3	U	
DELTA-BHC	2.3	U	
DIELDRIN	4.4	U	
ENDOSULFAN I	2.3	U	
ENDOSULFAN II	4.4	U	
ENDOSULFAN SULFATE	4.4	U	
ENDRIN	4.4	U	
ENDRIN ALDEHYDE	4.4	U	
ENDRIN KETONE	4.4	U	
GAMMA-BHC (LINDANE)	2.3	U	
GAMMA-CHLORDANE	2.3	U	
HEPTACHLOR	2.3	U	
HEPTACHLOR EPOXIDE	2.3	U	
METHOXYCHLOR	23	U	
TOXAPHENE	44	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	4.2	U	
4,4'-DDE	4.2	U	
4,4'-DDT	4.2	U	
ALDRIN	2.1	U	
ALPHA-BHC	1.5	J	P
ALPHA-CHLORDANE	2.1	U	
AROCLOR-1016	21	U	
AROCLOR-1221	21	U	
AROCLOR-1232	21	U	
AROCLOR-1242	21	U	
AROCLOR-1248	21	U	
AROCLOR-1254	21	U	
AROCLOR-1260	21	U	
BETA-BHC	2.1	U	
DELTA-BHC	2.1	U	
DIELDRIN	4.2	U	
ENDOSULFAN I	2.1	U	
ENDOSULFAN II	4.2	U	
ENDOSULFAN SULFATE	4.2	U	
ENDRIN	4.2	U	
ENDRIN ALDEHYDE	4.2	U	
ENDRIN KETONE	4.2	U	
GAMMA-BHC (LINDANE)	2.1	U	
GAMMA-CHLORDANE	2.1	U	
HEPTACHLOR	2.1	U	
HEPTACHLOR EPOXIDE	2.1	U	
METHOXYCHLOR	21	U	
TOXAPHENE	42	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 03SD1501
 samp_date 10/16/2006
 lab_id WW5540-2
 qc_type NM
 units UG/KG
 Pct_Solids 79.0
 DUP_OF:

nsample 03SD1601
 samp_date 10/16/2006
 lab_id WW5540-1
 qc_type NM
 units UG/KG
 Pct_Solids 76.0
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	4.2	U	
4,4'-DDE	4.2	U	
4,4'-DDT	4.2	U	
ALDRIN	2.2	U	
ALPHA-BHC	1.8	J	P
ALPHA-CHLORDANE	2.2	U	
AROCLOR-1016	22	U	
AROCLOR-1221	22	U	
AROCLOR-1232	22	U	
AROCLOR-1242	22	U	
AROCLOR-1248	22	U	
AROCLOR-1254	22	U	
AROCLOR-1260	22	U	
BETA-BHC	2.2	U	
DELTA-BHC	2.2	U	
DIELDRIN	4.2	U	
ENDOSULFAN I	2.2	U	
ENDOSULFAN II	4.2	U	
ENDOSULFAN SULFATE	4.2	U	
ENDRIN	4.2	U	
ENDRIN ALDEHYDE	4.2	U	
ENDRIN KETONE	4.2	U	
GAMMA-BHC (LINDANE)	2.2	U	
GAMMA-CHLORDANE	2.2	U	
HEPTACHLOR	2.2	U	
HEPTACHLOR EPOXIDE	2.2	U	
METHOXYCHLOR	22	U	
TOXAPHENE	42	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	4.3	U	
4,4'-DDE	4.3	U	
4,4'-DDT	4.3	U	
ALDRIN	2.2	U	
ALPHA-BHC	1.9	J	P
ALPHA-CHLORDANE	2.2	U	
AROCLOR-1016	22	U	
AROCLOR-1221	22	U	
AROCLOR-1232	22	U	
AROCLOR-1242	22	U	
AROCLOR-1248	22	U	
AROCLOR-1254	22	U	
AROCLOR-1260	22	U	
BETA-BHC	2.2	U	
DELTA-BHC	2.2	U	
DIELDRIN	4.3	U	
ENDOSULFAN I	2.2	U	
ENDOSULFAN II	4.3	U	
ENDOSULFAN SULFATE	4.3	U	
ENDRIN	4.3	U	
ENDRIN ALDEHYDE	4.3	U	
ENDRIN KETONE	4.3	U	
GAMMA-BHC (LINDANE)	2.2	U	
GAMMA-CHLORDANE	2.2	U	
HEPTACHLOR	2.2	U	
HEPTACHLOR EPOXIDE	2.2	U	
METHOXYCHLOR	22	U	
TOXAPHENE	43	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: HERB

nsample 03SD0101RE
samp_date 10/12/2006
lab_id WW5492-5RE
qc_type NM
units UG/KG
Pct_Solids 66.6
DUP_OF:

nsample 03SD0201RE
samp_date 10/12/2006
lab_id WW5492-4RE
qc_type NM
units UG/KG
Pct_Solids 64.6
DUP_OF:

nsample 03SD0301RE
samp_date 10/12/2006
lab_id WW5492-3RE
qc_type NM
units UG/KG
Pct_Solids 78.5
DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	50	U	
2,4,5-TP (SILVEX)	50	U	
2,4-D	50	U	
2,4-DB	50	U	
DALAPON	260	U	
DICAMBA	50	U	
DICHLOROPROP	100	U	
DINOSEB	260	U	
MCPA	7500	U	
MCPP	5000	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	51	U	
2,4,5-TP (SILVEX)	51	U	
2,4-D	51	U	
2,4-DB	51	U	
DALAPON	260	U	
DICAMBA	51	U	
DICHLOROPROP	100	U	
DINOSEB	260	U	
MCPA	7700	U	
MCPP	5100	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	42	U	
2,4,5-TP (SILVEX)	42	U	
2,4-D	42	U	
2,4-DB	42	U	
DALAPON	220	U	
DICAMBA	42	U	
DICHLOROPROP	85	U	
DINOSEB	220	U	
MCPA	6400	U	
MCPP	4200	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: HERB

nsample 03SD0401RE
samp_date 10/12/2006
lab_id WW5492-2RE
qc_type NM
units UG/KG
Pct_Solids 59.1
DUP_OF:

nsample 03SD0501RE
samp_date 10/12/2006
lab_id WW5492-1RE
qc_type NM
units UG/KG
Pct_Solids 70.7
DUP_OF:

nsample 03SD0601
samp_date 10/13/2006
lab_id WW5514-1
qc_type NM
units UG/KG
Pct_Solids 77.6
DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	56	U	
2,4,5-TP (SILVEX)	56	U	
2,4-D	56	U	
2,4-DB	56	U	
DALAPON	290	U	
DICAMBA	56	U	
DICHLOROPROP	110	U	
DINOSEB	290	U	
MCPA	8400	U	
MCPP	5600	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	47	U	
2,4,5-TP (SILVEX)	47	U	
2,4-D	47	U	
2,4-DB	47	U	
DALAPON	240	U	
DICAMBA	47	U	
DICHLOROPROP	95	U	
DINOSEB	240	U	
MCPA	7100	U	
MCPP	4700	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	42	U	
2,4,5-TP (SILVEX)	42	U	
2,4-D	42	U	
2,4-DB	42	U	
DALAPON	220	U	
DICAMBA	42	U	
DICHLOROPROP	86	U	
DINOSEB	220	U	
MCPA	6400	U	
MCPP	4200	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: HERB

nsample 03SD0601D
 samp_date 10/13/2006
 lab_id WW5514-2
 qc_type NM
 units UG/KG
 Pct_Solids 70.8
 DUP_OF: 03SD0601

nsample 03SD0701
 samp_date 10/13/2006
 lab_id WW5514-3
 qc_type NM
 units UG/KG
 Pct_Solids 83.4
 DUP_OF:

nsample 03SD0801
 samp_date 10/16/2006
 lab_id WW5540-6
 qc_type NM
 units UG/KG
 Pct_Solids 85.9
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	46	U	
2,4,5-TP (SILVEX)	46	U	
2,4-D	46	U	
2,4-DB	46	U	
DALAPON	240	U	
DICAMBA	46	U	
DICHLOROPROP	94	U	
DINOSEB	240	U	
MCPA	7000	U	
MCPP	4600	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	40	U	
2,4,5-TP (SILVEX)	40	U	
2,4-D	40	U	
2,4-DB	40	U	
DALAPON	200	U	
DICAMBA	40	U	
DICHLOROPROP	80	U	
DINOSEB	200	U	
MCPA	6000	U	
MCPP	4000	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	38	U	
2,4,5-TP (SILVEX)	38	U	
2,4-D	38	U	
2,4-DB	38	U	
DALAPON	200	U	
DICAMBA	38	U	
DICHLOROPROP	78	U	
DINOSEB	200	U	
MCPA	5800	U	
MCPP	3800	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: HERB

nsample 03SD0901
samp_date 10/16/2006
lab_id WW5540-5
qc_type NM
units UG/KG
Pct_Solids 82.7
DUP_OF:

nsample 03SD1001
samp_date 10/13/2006
lab_id WW5514-4
qc_type NM
units UG/KG
Pct_Solids 54.7
DUP_OF:

nsample 03SD1101
samp_date 10/17/2006
lab_id WW5572-1
qc_type NM
units UG/KG
Pct_Solids 82.5
DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	40	U	
2,4,5-TP (SILVEX)	40	U	
2,4-D	40	U	
2,4-DB	40	U	
DALAPON	200	U	
DICAMBA	40	U	
DICHLOROPROP	81	U	
DINOSEB	200	U	
MCPA	6000	U	
MCPP	4000	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	60	U	
2,4,5-TP (SILVEX)	60	U	
2,4-D	60	U	
2,4-DB	60	U	
DALAPON	310	U	
DICAMBA	60	U	
DICHLOROPROP	120	U	
DINOSEB	310	U	
MCPA	9100	U	
MCPP	6000	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	40	U	
2,4,5-TP (SILVEX)	40	U	
2,4-D	40	U	
2,4-DB	40	U	
DALAPON	200	U	
DICAMBA	40	U	
DICHLOROPROP	81	U	
DINOSEB	200	U	
MCPA	6000	U	
MCPP	4000	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: HERB

nsample 03SD1201
 samp_date 10/17/2006
 lab_id WW5572-2
 qc_type NM
 units UG/KG
 Pct_Solids 83.0
 DUP_OF:

nsample 03SD1301
 samp_date 10/16/2006
 lab_id WW5540-4
 qc_type NM
 units UG/KG
 Pct_Solids 74.3
 DUP_OF:

nsample 03SD1401
 samp_date 10/16/2006
 lab_id WW5540-3
 qc_type NM
 units UG/KG
 Pct_Solids 79.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	40	U	
2,4,5-TP (SILVEX)	40	U	
2,4-D	40	U	
2,4-DB	40	U	
DALAPON	200	U	
DICAMBA	40	U	
DICHLOROPROP	81	U	
DINOSEB	200	U	
MCPA	6000	U	
MCPP	4000	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	44	U	
2,4,5-TP (SILVEX)	44	U	
2,4-D	44	U	
2,4-DB	44	U	
DALAPON	230	U	
DICAMBA	44	U	
DICHLOROPROP	90	U	
DINOSEB	230	U	
MCPA	6700	U	
MCPP	4400	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	42	U	
2,4,5-TP (SILVEX)	42	U	
2,4-D	42	U	
2,4-DB	42	U	
DALAPON	210	U	
DICAMBA	42	U	
DICHLOROPROP	84	U	
DINOSEB	210	U	
MCPA	6300	U	
MCPP	4200	U	

PROJ_NO: 00464

SDG: CTO041-2 MEDIA: SOIL DATA FRACTION: HERB

nsample 03SD1501
samp_date 10/16/2006
lab_id WW5540-2
qc_type NM
units UG/KG
Pct_Solids 79.0
DUP_OF:

nsample 03SD1601
samp_date 10/16/2006
lab_id WW5540-1
qc_type NM
units UG/KG
Pct_Solids 76.0
DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	42	U	
2,4,5-TP (SILVEX)	42	U	
2,4-D	42	U	
2,4-DB	42	U	
DALAPON	220	U	
DICAMBA	42	U	
DICHLOROPROP	85	U	
DINOSEB	220	U	
MCPA	6300	U	
MCPP	4200	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	43	U	
2,4,5-TP (SILVEX)	43	U	
2,4-D	43	U	
2,4-DB	43	U	
DALAPON	220	U	
DICAMBA	43	U	
DICHLOROPROP	88	U	
DINOSEB	220	U	
MCPA	6600	U	
MCPP	4300	U	



Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: R. Fisher **DATE:** JANUARY 3, 2007
FROM: MATTHEW D. KRAUS **COPIES:** DV FILE
SUBJECT: INORGANIC DATA VALIDATION – TAL METALS
NCBC GULFPORT – CTO 041
SAMPLE DELIVERY GROUP (SDG) – WW6335

SAMPLES: 17/Sediment/

03SD0101	03SD0201	03SD0301
03SD0401	03SD0501	03SD0601
03SD0601D	03SD0701	03SD0801
03SD0901	03SD1001	03SD1101
03SD1201	03SD1301	03SD1401
03SD1501	03SD1601	

Overview

The sample set for NCBC GULFPORT, CTO 041, SDG WW6335, consists of seventeen sediment environmental samples. One field duplicate pair (03SD0601 / 03SD0601D) is included in this SDG.

All samples were analyzed for target analyte list (TAL) metals. The samples were collected by Tetra Tech NUS on October 12-13, 15-17, 2006 and analyzed by Katahdin Analytical Services. TAL analyses (except mercury) were conducted using SW-846 6010B. Mercury analyses were conducted using SW-846 7470A.

Metals analyses were conducted using Inductively Coupled Plasma Atomic Absorption (ICP) methodologies and mercury analyses were conducted using Cold Vapor Atomic Absorption (CVAA) methodologies.

These data were evaluated based on the following parameters:

- * • Data Completeness
 - * • Holding Times
 - * • Calibration Analyses
 - Laboratory Blank Analyses
 - * • Field Duplicate Precision
 - * • Detection Limits
- * - All quality control criteria were met for this parameter.

TO: FISHER, R – PAGE 2
DATE: JANUARY 3, 2007

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level (mg/kg)</u>
Aluminum	245 ug/L	122
Antimony	3.79 ug/L	1.90
Arsenic	3.12 ug/L	1.56
Barium	1.81 ug/L	0.90
Beryllium	1.85 ug/L	0.92
Cadmium	1.66 ug/L	0.83
Calcium	125 ug/L	62.5
Calcium ⁽²⁾	45.3 ug/L	22.6
Chromium	2.52 ug/L	1.26
Cobalt	1.65 ug/L	0.82
Copper ⁽¹⁾	0.44 mg/kg	2.20
Iron ⁽¹⁾	7.83 mg/kg	31.2
Lead	2.41 ug/L	1.20
Magnesium	99.8 ug/L	49.9
Magnesium ⁽²⁾	46.6 ug/L	23.3
Manganese	2.65 ug/L	1.32
Nickel	0.39 mg/kg	1.95
Potassium	708 ug/L	354
Selenium ⁽¹⁾	0.63 mg/kg	3.15
Sodium	55.6 ug/L	27.8
Thallium	10.4 ug/L	5.20
Zinc ⁽¹⁾	0.28 mg/kg	1.40

⁽¹⁾ Maximum concentration is present in the laboratory preparation blank.

⁽²⁾ Maximum blank concentrations and action levels only apply to those samples run on the TJA 61 ICP instrument. Calcium results affected are include samples 03SD0801, 03SD0901, 03SD1401, and 03SD1501. The only magnesium result affected is in sample 03SD1501.

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot, percent solids, and dilution factors, if applicable, were taken into consideration when evaluating for blank contamination. Positive results less than the blank action level for arsenic, beryllium, cadmium, calcium, cobalt, copper, lead, nickel, potassium, selenium, and sodium were qualified "U" due to blank contamination.

Notes

TAL metals analyses were not requested on the chain-of-custodies (COCs). The TAL metals analyses of sediments were requested at a later date by the Project Manager (PM) Robert Fisher.

Executive Summary

Laboratory Performance: Several analytes were qualified due to laboratory blank contamination.

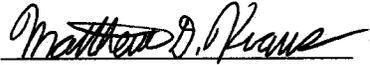
Other Factors Affecting Data Quality: None.

TO: FISHER, R – PAGE 3
DATE: JANUARY 3, 2007

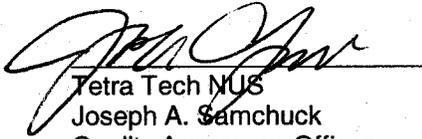
The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", October 2004 and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DoD QSM and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS
Matthew D. Kraus
Chemist / Environmental Scientist



Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 00464

SDG: WW6335 MEDIA: SOIL DATA FRACTION: M

nsample 03SD0101
 samp_date 10/12/2006
 lab_id WW6335-001
 qc_type NM
 units MG/KG
 Pct_Solids 66.6
 DUP_OF:

nsample 03SD0201
 samp_date 10/12/2006
 lab_id WW6335-002
 qc_type NM
 units MG/KG
 Pct_Solids 64.6
 DUP_OF:

nsample 03SD0301
 samp_date 10/12/2006
 lab_id WW6335-003
 qc_type NM
 units MG/KG
 Pct_Solids 78.5
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	14200		
ANTIMONY	0.32	U	
ARSENIC	6		
BARIUM	38.3		
BERYLLIUM	0.31	U	A
CADMIUM	0.33	U	A
CALCIUM	822		
CHROMIUM	14.9		
COBALT	2		
COPPER	7.5		
IRON	10900		
LEAD	18		
MAGNESIUM	537		
MANGANESE	33.4		
MERCURY	0.05		
NICKEL	5.8		
POTASSIUM	378	U	A
SELENIUM	0.83	U	A
SILVER	0.14	U	
SODIUM	39		
THALLIUM	0.72	U	
VANADIUM	21.3		
ZINC	44.3		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	14000		
ANTIMONY	0.39	U	
ARSENIC	5.4		
BARIUM	36.4		
BERYLLIUM	0.38	U	A
CADMIUM	0.26	U	A
CALCIUM	298		
CHROMIUM	14.9		
COBALT	1.4		
COPPER	7.9		
IRON	5800		
LEAD	14.9		
MAGNESIUM	454		
MANGANESE	14.2		
MERCURY	0.04		
NICKEL	5.8		
POTASSIUM	330	U	A
SELENIUM	0.64	U	A
SILVER	0.18	U	
SODIUM	10.4	U	A
THALLIUM	0.87	U	
VANADIUM	22.1		
ZINC	37.9		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	2320		
ANTIMONY	0.33	U	
ARSENIC	13.2		
BARIUM	5.6		
BERYLLIUM	0.04	U	A
CADMIUM	0.06	U	
CALCIUM	762		
CHROMIUM	4.6		
COBALT	0.53	U	A
COPPER	3.6		
IRON	2890		
LEAD	10		
MAGNESIUM	389		
MANGANESE	6.1		
MERCURY	0.01		
NICKEL	3		
POTASSIUM	122	U	A
SELENIUM	0.5	U	
SILVER	0.15	U	
SODIUM	11.4	U	A
THALLIUM	0.75	U	
VANADIUM	5.8		
ZINC	13.7		

PROJ_NO: 00464

SDG: WW6335 MEDIA: SOIL DATA FRACTION: M

nsample 03SD0401
 samp_date 10/12/2006
 lab_id WW6335-004
 qc_type NM
 units MG/KG
 Pct_Solids 59.1
 DUP_OF:

nsample 03SD0501
 samp_date 10/12/2006
 lab_id WW6335-005
 qc_type NM
 units MG/KG
 Pct_Solids 70.7
 DUP_OF:

nsample 03SD0601
 samp_date 10/13/2006
 lab_id WW6335-006
 qc_type NM
 units MG/KG
 Pct_Solids 77.6
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	15600		
ANTIMONY	0.37	U	
ARSENIC	12.7		
BARIUM	22.9		
BERYLLIUM	0.27	U	A
CADMIUM	0.44	U	A
CALCIUM	892		
CHROMIUM	17.1		
COBALT	1.9		
COPPER	9.3		
IRON	12000		
LEAD	22		
MAGNESIUM	568		
MANGANESE	16.4		
MERCURY	0.07		
NICKEL	6.2		
POTASSIUM	402	U	A
SELENIUM	0.56	U	
SILVER	0.17	U	
SODIUM	8.3	U	A
THALLIUM	0.84	U	
VANADIUM	25.4		
ZINC	57.5		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	8480		
ANTIMONY	0.21	U	
ARSENIC	6.7		
BARIUM	22		
BERYLLIUM	0.18	U	A
CADMIUM	0.22	U	A
CALCIUM	351		
CHROMIUM	9.2		
COBALT	1.5		
COPPER	5		
IRON	7680		
LEAD	12.1		
MAGNESIUM	272		
MANGANESE	16.3		
MERCURY	0.03		
NICKEL	3.8		
POTASSIUM	180	U	A
SELENIUM	0.42	U	A
SILVER	0.1	U	
SODIUM	12.6	U	A
THALLIUM	0.47	U	
VANADIUM	14		
ZINC	31.8		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	7840		
ANTIMONY	0.25	U	
ARSENIC	2.9		
BARIUM	13.8		
BERYLLIUM	0.1	U	A
CADMIUM	0.06	U	A
CALCIUM	350		
CHROMIUM	8.5		
COBALT	0.84		
COPPER	4.5		
IRON	5000		
LEAD	9.9		
MAGNESIUM	295		
MANGANESE	9.3		
MERCURY	0.02		
NICKEL	3.3		
POTASSIUM	287	U	A
SELENIUM	0.46	U	A
SILVER	0.11	U	
SODIUM	37.4		
THALLIUM	0.55	U	
VANADIUM	12		
ZINC	18.6		

PROJ_NO: 00464

SDG: WW6335 MEDIA: SOIL DATA FRACTION: M

nsample 03SD0601D
 samp_date 10/13/2006
 lab_id WW6335-007
 qc_type NM
 units MG/KG
 Pct_Solids 70.8
 DUP_OF: 03SD0601

nsample 03SD0701
 samp_date 10/13/2006
 lab_id WW6335-008
 qc_type NM
 units MG/KG
 Pct_Solids 83.4
 DUP_OF:

nsample 03SD0801
 samp_date 10/16/2006
 lab_id WW6335-009
 qc_type NM
 units MG/KG
 Pct_Solids 85.9
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	10300		
ANTIMONY	0.35	U	
ARSENIC	4.1		
BARIUM	22		
BERYLLIUM	0.14	U	A
CADMIUM	0.12	U	A
CALCIUM	526		
CHROMIUM	10.3		
COBALT	0.95	U	A
COPPER	6.4		
IRON	6320		
LEAD	13.2		
MAGNESIUM	354		
MANGANESE	11.7		
MERCURY	0.02		
NICKEL	3.9		
POTASSIUM	289	U	A
SELENIUM	1.1	U	A
SILVER	0.16	U	
SODIUM	37.4		
THALLIUM	0.8	U	
VANADIUM	15.4		
ZINC	23.4		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	5040		
ANTIMONY	0.25	U	
ARSENIC	0.98	U	A
BARIUM	7.3		
BERYLLIUM	0.06	U	A
CADMIUM	0.05	U	
CALCIUM	98.6		
CHROMIUM	4.7		
COBALT	0.37	U	A
COPPER	1.2	U	A
IRON	2750		
LEAD	2.6		
MAGNESIUM	188		
MANGANESE	4		
MERCURY	0.01	U	
NICKEL	1.7	U	A
POTASSIUM	135	U	A
SELENIUM	0.38	U	
SILVER	0.11	U	
SODIUM	23.2	U	A
THALLIUM	0.56	U	
VANADIUM	8.4		
ZINC	3.3		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	2270		
ANTIMONY	0.24	U	
ARSENIC	0.47	U	A
BARIUM	2.5		
BERYLLIUM	0.02	U	
CADMIUM	0.05	U	
CALCIUM	18.8	U	A
CHROMIUM	3.2		
COBALT	0.11	U	
COPPER	2.3		
IRON	1170		
LEAD	3.3		
MAGNESIUM	74.4		
MANGANESE	2.7		
MERCURY	0.01	U	
NICKEL	1.5	U	A
POTASSIUM	60.39	U	
SELENIUM	0.5	U	A
SILVER	0.11	U	
SODIUM	20.7	U	A
THALLIUM	0.55	U	
VANADIUM	4		
ZINC	2.6		

PROJ_NO: 00464

SDG: WW6335 MEDIA: SOIL DATA FRACTION: M

nsample 03SD0901
 samp_date 10/16/2006
 lab_id WW6335-010
 qc_type NM
 units MG/KG
 Pct_Solids 82.7
 DUP_OF:

nsample 03SD1001
 samp_date 10/13/2006
 lab_id WW6335-011
 qc_type NM
 units MG/KG
 Pct_Solids 54.7
 DUP_OF:

nsample 03SD1101
 samp_date 10/17/2006
 lab_id WW6335-012
 qc_type NM
 units MG/KG
 Pct_Solids 82.5
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	3650		
ANTIMONY	0.32	U	
ARSENIC	1.4	U	A
BARIUM	4.4		
BERYLLIUM	0.06	U	A
CADMIUM	0.06	U	
CALCIUM	23.9	U	A
CHROMIUM	4		
COBALT	0.19	U	A
COPPER	1.9	U	A
IRON	1300		
LEAD	5		
MAGNESIUM	118		
MANGANESE	3.6		
MERCURY	0.01	U	
NICKEL	1.4	U	A
POTASSIUM	80.27	U	
SELENIUM	0.49	U	
SILVER	0.15	U	
SODIUM	18	U	A
THALLIUM	0.73	U	
VANADIUM	6.1		
ZINC	2.8		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	9090		
ANTIMONY	0.39	U	
ARSENIC	3.7		
BARIUM	30.2		
BERYLLIUM	0.31	U	A
CADMIUM	0.14	U	A
CALCIUM	628		
CHROMIUM	10		
COBALT	1.3		
COPPER	4.1		
IRON	7000		
LEAD	11.8		
MAGNESIUM	377		
MANGANESE	11.8		
MERCURY	0.02		
NICKEL	4.2		
POTASSIUM	156	U	A
SELENIUM	0.62	U	A
SILVER	0.17	U	
SODIUM	24.9	U	A
THALLIUM	0.87	U	
VANADIUM	13.6		
ZINC	33		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	1640		
ANTIMONY	0.3	U	
ARSENIC	1.6	U	A
BARIUM	3.4		
BERYLLIUM	0.05	U	A
CADMIUM	0.06	U	
CALCIUM	165		
CHROMIUM	2.9		
COBALT	0.17	U	A
COPPER	1.2	U	A
IRON	1900		
LEAD	2		
MAGNESIUM	76.3		
MANGANESE	2.9		
MERCURY	0.01	U	
NICKEL	1.2	U	A
POTASSIUM	74.49	U	
SELENIUM	0.45	U	
SILVER	0.14	U	
SODIUM	8.9	U	A
THALLIUM	0.68	U	
VANADIUM	5.2		
ZINC	1.8		

PROJ_NO: 00464

SDG: WW6335 MEDIA: SOIL DATA FRACTION: M

nsample 03SD1201
 samp_date 10/17/2006
 lab_id WW6335-013
 qc_type NM
 units MG/KG
 Pct_Solids 83.0
 DUP_OF:

nsample 03SD1301
 samp_date 10/16/2006
 lab_id WW6335-014
 qc_type NM
 units MG/KG
 Pct_Solids 74.3
 DUP_OF:

nsample 03SD1401
 samp_date 10/16/2006
 lab_id WW6335-015
 qc_type NM
 units MG/KG
 Pct_Solids 79.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	5280		
ANTIMONY	0.3	U	
ARSENIC	1	U	A
BARIUM	8.4		
BERYLLIUM	0.09	U	A
CADMIUM	0.06	U	
CALCIUM	367		
CHROMIUM	5.4		
COBALT	0.29	U	A
COPPER	1.5	U	A
IRON	3680		
LEAD	4.1		
MAGNESIUM	241		
MANGANESE	8.3		
MERCURY	0.01	U	
NICKEL	2	U	A
POTASSIUM	75.45	U	
SELENIUM	0.46	U	
SILVER	0.14	U	
SODIUM	19.3	U	A
THALLIUM	0.69	U	
VANADIUM	7.3		
ZINC	4.2		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	2380		
ANTIMONY	0.25	U	
ARSENIC	1.4	U	A
BARIUM	4.2		
BERYLLIUM	0.04	U	A
CADMIUM	0.05	U	
CALCIUM	215		
CHROMIUM	3		
COBALT	0.19	U	A
COPPER	1.5	U	A
IRON	1710		
LEAD	1.9		
MAGNESIUM	92.1		
MANGANESE	3		
MERCURY	0.01	U	
NICKEL	1.5	U	A
POTASSIUM	72.4	U	A
SELENIUM	0.44	U	A
SILVER	0.11	U	
SODIUM	4.07	U	
THALLIUM	0.55	U	
VANADIUM	3.8		
ZINC	6.1		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	2570		
ANTIMONY	0.27	U	
ARSENIC	0.65	U	A
BARIUM	5.8		
BERYLLIUM	0.05	U	A
CADMIUM	0.05	U	
CALCIUM	112		
CHROMIUM	2.7		
COBALT	0.18	U	A
COPPER	1.2	U	A
IRON	1010		
LEAD	12.8		
MAGNESIUM	102		
MANGANESE	3.3		
MERCURY	0.01	U	
NICKEL	1.3	U	A
POTASSIUM	67.98	U	
SELENIUM	0.66	U	A
SILVER	0.12	U	
SODIUM	7.4	U	A
THALLIUM	0.62	U	
VANADIUM	2.9		
ZINC	2.2		

PROJ_NO: 00464

SDG: WW6335 MEDIA: SOIL DATA FRACTION: M

nsample 03SD1501
samp_date 10/16/2006
lab_id WW6335-016
qc_type NM
units MG/KG
Pct_Solids 79.0
DUP_OF:

nsample 03SD1601
samp_date 10/16/2006
lab_id WW6335-017
qc_type NM
units MG/KG
Pct_Solids 76.0
DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	713		
ANTIMONY	0.24	U	
ARSENIC	0.28	U	
BARIUM	1.7		
BERYLLIUM	0.02	U	
CADMIUM	0.04	U	
CALCIUM	74.4		
CHROMIUM	1.4		
COBALT	0.14	U	A
COPPER	0.9	U	A
IRON	579		
LEAD	0.71	U	A
MAGNESIUM	33.2		
MANGANESE	1.7		
MERCURY	0.01	U	
NICKEL	0.87	U	A
POTASSIUM	59.62	U	
SELENIUM	0.36	U	
SILVER	0.11	U	
SODIUM	4.8	U	A
THALLIUM	0.54	U	
VANADIUM	1.3		
ZINC	1.3		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	6130		
ANTIMONY	0.31	U	
ARSENIC	4.6		
BARIUM	10.5		
BERYLLIUM	0.08	U	A
CADMIUM	0.1	U	A
CALCIUM	562		
CHROMIUM	7		
COBALT	0.55	U	A
COPPER	1.9	U	A
IRON	10200		
LEAD	3.3		
MAGNESIUM	215		
MANGANESE	11		
MERCURY	0.01	U	
NICKEL	2.2	U	A
POTASSIUM	122	U	A
SELENIUM	0.47	U	
SILVER	0.14	U	
SODIUM	5.13	U	
THALLIUM	0.7	U	
VANADIUM	13.8		
ZINC	6.4		



6500 Sunplex Drive
Ocean Springs, MS 39564
228.875.6420 Phone
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July 16, 2007

Bob Fisher

Work Order # : 0707014

Tetra Tech NUS, Inc.
3360 Capital Circle NE Suite B
Tallahassee, FL 32308
RE: Gulfport, NCBC CTO 41

Purchase Order # CTO-0041

Enclosed are the results of analyses for samples received by the laboratory on 07/03/07 09:15. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Harry P. Howell". The signature is written in a cursive style.

Harry P. Howell

President

DISCLAIMER

The results only relate to the items or the sample and/or samples received by the laboratory. This report shall not be reproduced except in full, without the approval of the laboratory.



6500 Sunplex Drive
 Ocean Springs, MS 39564
 228-875-6420 Phone
 228-875-6423 Fax

Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GPT-03-08GW-001	0707014-01	Water	07/01/07 11:45	07/03/07 09:15
GPT-03-09GW-001	0707014-02	Water	07/01/07 15:45	07/03/07 09:15
GPT-03-10GW-001	0707014-03	Water	07/01/07 15:30	07/03/07 09:15
GPT-03-11GW-001	0707014-04	Water	07/01/07 17:55	07/03/07 09:15
GPT-03-12GW-001	0707014-05	Water	07/01/07 17:45	07/03/07 09:15
GPT-03-13GW-001	0707014-06	Water	07/01/07 20:30	07/03/07 09:15
GPT-03-13GW-001 D	0707014-07	Water	07/01/07 20:30	07/03/07 09:15
GPT-03-14GW-001	0707014-08	Water	07/01/07 20:35	07/03/07 09:15
GPT-03-15GW-001	0707014-09	Water	07/02/07 10:15	07/03/07 09:15
GPT-03-16GW-001	0707014-10	Water	07/02/07 09:50	07/03/07 09:15
GPT-03-17GW-001	0707014-13	Water	07/02/07 13:00	07/03/07 09:15
TripBlank TBV#4841	0707014-14	Water	07/01/07 11:45	07/03/07 09:15

Tetra Tech NUS, Inc.
3360 Capital Circle NE Suite B
Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

Case Narrative

SAMPLE RECEIVING

Samples received in good condition.

Samples received at 0.4 °C. Recommended range is 2-6° C.

Chain of Custody and container labels agree.

Container labels complete.

Chain of Custody complete.

Received on ice.

Custody sealed.

Volatile Organics:

Batch 7G10010: 0707014-01/02/03/04/05/06/07/08/09/13/14

The sample(s) were analyzed within the required holding time. 8260-5030

All target analytes in the lab blank were below the MRL. 8260-5030

The instrument calibration met the acceptance criteria for all reported analytes. 8260-5030

All surrogates were within the acceptance criteria range. 8260-5030

Lab control sample(s) within the acceptance criteria range. 8260-5030

Sample(s) received and analyzed with zero headspace. 8260-5030

pH of sample(s) is less than two. 8260-5030

No qualifiers indicated. 8260-5030

Batch 7G13013: 0707014-10

The sample(s) were analyzed within the required holding time. 8260-5030

All target analytes in the lab blank were below the MRL. 8260-5030

The instrument calibration met the acceptance criteria for all reported analytes with the exception of dichlorodifluoromethane. 8260-5030

All surrogates were within the acceptance criteria range. 8260-5030

Lab control sample(s) within the acceptance criteria range. 8260-5030

Matrix spike sample(s) within acceptance criteria range. 8260-5030

Duplicate results within the acceptance criteria range (cis-1,2-dichloroethene only). 8260-5030

Sample(s) received and analyzed with zero headspace. 8260-5030

pH of sample(s) is less than two. 8260-5030

E-01: The concentration of cis-1,2-dichloroethene is above the calibration range of the instrument. Results are from a secondary (x10) dilution. 8260-5030

Note: The relative standard deviation (%RSD) of dichlorodifluoromethane for the calibration is 15.53%. The method requires that it be <15%.

Tetra Tech NUS, Inc.
3360 Capital Circle NE Suite B
Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

GPT-03-08GW-001
0707014-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

Acetone	ND	10.0	ug/L	1	7G10010	07/10/07	07/10/07	EPA 8260B	
Benzene	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
Carbon Tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	ND	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	5.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
Vinyl acetate	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		103 %	78-136	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		104 %	65-139	"	"	"	"	"	
Surrogate: Toluene-d8		97.0 %	56-130	"	"	"	"	"	



6500 Sunplex Drive
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Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-08GW-001
0707014-01 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

<i>Surrogate: 4-Bromofluorobenzene</i>		97.0 %	43-130		7G10010	07/10/07	07/10/07	EPA 8260B	
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Tetra Tech NUS, Inc.
3360 Capital Circle NE Suite B
Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

GPT-03-09GW-001
0707014-02 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

Acetone	ND	10.0	ug/L	1	7G10010	07/10/07	07/10/07	EPA 8260B	
Benzene	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
Carbon Tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	ND	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	5.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
Vinyl acetate	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		101 %	78-136	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		107 %	65-139	"	"	"	"	"	
Surrogate: Toluene-d8		97.4 %	56-130	"	"	"	"	"	



6500 Sunplex Drive
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Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-09GW-001
0707014-02 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

<i>Surrogate: 4-Bromofluorobenzene</i>		98.0 %	43-130		7G10010	07/10/07	07/10/07	EPA 8260B	
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Tetra Tech NUS, Inc.
3360 Capital Circle NE Suite B
Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

GPT-03-10GW-001
0707014-03 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

Acetone	ND	10.0	ug/L	1	7G10010	07/10/07	07/10/07	EPA 8260B	
Benzene	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
Carbon Tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	ND	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	5.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
Vinyl acetate	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		101 %	78-136	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		105 %	65-139	"	"	"	"	"	
Surrogate: Toluene-d8		98.6 %	56-130	"	"	"	"	"	



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 228-875-6420 Phone
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Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-10GW-001
0707014-03 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

<i>Surrogate: 4-Bromofluorobenzene</i>	97.2 %	43-130		7G10010	07/10/07	07/10/07	EPA 8260B		
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Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-11GW-001
0707014-04 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

Acetone	ND	10.0	ug/L	1	7G10010	07/10/07	07/10/07	EPA 8260B	
Benzene	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
Carbon Tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	ND	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	5.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
Vinyl acetate	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		101 %	78-136	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		105 %	65-139	"	"	"	"	"	
Surrogate: Toluene-d8		98.5 %	56-130	"	"	"	"	"	



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Tetra Tech NUS, Inc.
3360 Capital Circle NE Suite B
Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

GPT-03-11GW-001
0707014-04 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

<i>Surrogate: 4-Bromofluorobenzene</i>	97.4 %	43-130	7G10010	07/10/07	07/10/07	EPA 8260B
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Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-12GW-001
0707014-05 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

Acetone	ND	10.0	ug/L	1	7G10010	07/10/07	07/10/07	EPA 8260B	
Benzene	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
Carbon Tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	ND	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	5.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
Vinyl acetate	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		103 %	78-136	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		106 %	65-139	"	"	"	"	"	
Surrogate: Toluene-d8		98.6 %	56-130	"	"	"	"	"	



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Tetra Tech NUS, Inc.
3360 Capital Circle NE Suite B
Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

GPT-03-12GW-001
0707014-05 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

<i>Surrogate: 4-Bromofluorobenzene</i>	96.4 %	43-130		7G10010	07/10/07	07/10/07	EPA 8260B		
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Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-13GW-001
0707014-06 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

Acetone	ND	10.0	ug/L	1	7G10010	07/10/07	07/10/07	EPA 8260B	
Benzene	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
Carbon Tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	ND	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	5.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
Vinyl acetate	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		99.3 %	78-136	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		106 %	65-139	"	"	"	"	"	
Surrogate: Toluene-d8		98.3 %	56-130	"	"	"	"	"	



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Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-13GW-001
0707014-06 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

<i>Surrogate: 4-Bromofluorobenzene</i>		97.5 %	43-130		7G10010	07/10/07	07/10/07	EPA 8260B	
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Tetra Tech NUS, Inc.
3360 Capital Circle NE Suite B
Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

GPT-03-13GW-001 D
0707014-07 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

Acetone	ND	10.0	ug/L	1	7G10010	07/10/07	07/10/07	EPA 8260B	
Benzene	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
Carbon Tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	ND	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	5.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
Vinyl acetate	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		103 %	78-136	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		108 %	65-139	"	"	"	"	"	
Surrogate: Toluene-d8		100 %	56-130	"	"	"	"	"	



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Tetra Tech NUS, Inc.
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 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-13GW-001 D
0707014-07 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

<i>Surrogate: 4-Bromofluorobenzene</i>	99.2 %	43-130		7G10010	07/10/07	07/10/07	EPA 8260B		
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Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-14GW-001
0707014-08 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

Acetone	ND	10.0	ug/L	1	7G10010	07/10/07	07/10/07	EPA 8260B	
Benzene	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
Carbon Tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	ND	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	5.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
Vinyl acetate	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		103 %	78-136	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		107 %	65-139	"	"	"	"	"	
Surrogate: Toluene-d8		98.2 %	56-130	"	"	"	"	"	



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Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-14GW-001
0707014-08 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

<i>Surrogate: 4-Bromofluorobenzene</i>		99.0 %	43-130		7G10010	07/10/07	07/10/07	EPA 8260B	
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Tetra Tech NUS, Inc.
3360 Capital Circle NE Suite B
Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

GPT-03-15GW-001
0707014-09 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

Acetone	ND	10.0	ug/L	1	7G10010	07/10/07	07/10/07	EPA 8260B	
Benzene	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
Carbon Tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	ND	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	5.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
Vinyl acetate	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		100 %	78-136	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		104 %	65-139	"	"	"	"	"	
Surrogate: Toluene-d8		99.2 %	56-130	"	"	"	"	"	



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Tetra Tech NUS, Inc.
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Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-15GW-001
0707014-09 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

<i>Surrogate: 4-Bromofluorobenzene</i>	96.4 %	43-130		7G10010	07/10/07	07/10/07	EPA 8260B		
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Tetra Tech NUS, Inc.
3360 Capital Circle NE Suite B
Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

GPT-03-16GW-001
0707014-10 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

Acetone	13.9	10.0	ug/L	1	7G13013	07/13/07	07/13/07	EPA 8260B	
Benzene	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
Carbon Tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	65.7	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	21.2	5.00	"	"	"	"	"	"	
Vinyl chloride	29.4	5.00	"	"	"	"	"	"	
o-Xylene	ND	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	5.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
Vinyl acetate	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	377	50.0	"	10	"	"	"	"	E-01
Surrogate: Dibromofluoromethane		106 %		78-136	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		99.4 %		65-139	"	"	"	"	
Surrogate: Toluene-d8		99.7 %		56-130	"	"	"	"	



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Tetra Tech NUS, Inc.
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Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-16GW-001
0707014-10 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

<i>Surrogate: 4-Bromofluorobenzene</i>	94.7 %	43-130			7G13013	07/13/07	07/13/07	EPA 8260B	
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Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-17GW-001
0707014-13 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

Acetone	ND	10.0	ug/L	1	7G10010	07/10/07	07/10/07	EPA 8260B	
Benzene	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
Carbon Tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	ND	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	5.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
Vinyl acetate	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		99.3 %	78-136	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		106 %	65-139	"	"	"	"	"	
Surrogate: Toluene-d8		97.9 %	56-130	"	"	"	"	"	



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Tetra Tech NUS, Inc.
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Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

GPT-03-17GW-001
0707014-13 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

<i>Surrogate: 4-Bromofluorobenzene</i>	96.3 %	43-130			7G10010	07/10/07	07/10/07	EPA 8260B	
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Tetra Tech NUS, Inc.
3360 Capital Circle NE Suite B
Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

TripBlank TBV#4841
0707014-14 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

Acetone	ND	10.0	ug/L	1	7G10010	07/10/07	07/10/07	EPA 8260B	
Benzene	ND	5.00	"	"	"	"	"	"	
Bromodichloromethane	ND	5.00	"	"	"	"	"	"	
Bromoform	ND	5.00	"	"	"	"	"	"	
Bromomethane	ND	5.00	"	"	"	"	"	"	
Carbon Tetrachloride	ND	5.00	"	"	"	"	"	"	
Chlorobenzene	ND	5.00	"	"	"	"	"	"	
Chloroethane	ND	5.00	"	"	"	"	"	"	
2-Butanone	ND	10.0	"	"	"	"	"	"	
Chloroform	ND	5.00	"	"	"	"	"	"	
Carbon disulfide	ND	5.00	"	"	"	"	"	"	
Chloromethane	ND	5.00	"	"	"	"	"	"	
Dibromochloromethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.00	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.00	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.00	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.00	"	"	"	"	"	"	
Ethylbenzene	ND	5.00	"	"	"	"	"	"	
Methylene chloride	ND	5.00	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.00	"	"	"	"	"	"	
Tetrachloroethene	ND	5.00	"	"	"	"	"	"	
Toluene	ND	5.00	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.00	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.00	"	"	"	"	"	"	
Trichloroethene	ND	5.00	"	"	"	"	"	"	
Vinyl chloride	ND	5.00	"	"	"	"	"	"	
o-Xylene	ND	5.00	"	"	"	"	"	"	
m,p-Xylene	ND	5.00	"	"	"	"	"	"	
2-Hexanone	ND	10.0	"	"	"	"	"	"	
4-Methyl-2-pentanone	ND	10.0	"	"	"	"	"	"	
Styrene	ND	5.00	"	"	"	"	"	"	
Vinyl acetate	ND	5.00	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.00	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		100 %	78-136	"	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		105 %	65-139	"	"	"	"	"	
Surrogate: Toluene-d8		100 %	56-130	"	"	"	"	"	



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Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

TripBlank TBV#4841
0707014-14 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Micro-Methods Laboratory, Inc.

Volatile Organic Compounds by EPA Method 8260B

<i>Surrogate: 4-Bromofluorobenzene</i>		95.7 %	43-130		7G10010	07/10/07	07/10/07	EPA 8260B	
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Tetra Tech NUS, Inc.
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Project: Gulfport, NCBC CTO 41

Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Micro-Methods Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 7G10010 - EPA 5030B

Blank (7G10010-BLK1)

Prepared & Analyzed: 07/10/07

Acetone	ND	10.0	ug/L							
Benzene	ND	5.00	"							
Bromodichloromethane	ND	5.00	"							
Bromoform	ND	5.00	"							
Bromomethane	ND	5.00	"							
Carbon Tetrachloride	ND	5.00	"							
Chlorobenzene	ND	5.00	"							
Chloroethane	ND	5.00	"							
2-Butanone	ND	10.0	"							
Chloroform	ND	5.00	"							
Carbon disulfide	ND	5.00	"							
Chloromethane	ND	5.00	"							
Dibromochloromethane	ND	5.00	"							
1,1-Dichloroethane	ND	5.00	"							
1,2-Dichloroethane	ND	5.00	"							
1,1-Dichloroethene	ND	5.00	"							
trans-1,2-Dichloroethene	ND	5.00	"							
1,2-Dichloropropane	ND	5.00	"							
cis-1,3-Dichloropropene	ND	5.00	"							
trans-1,3-Dichloropropene	ND	5.00	"							
Ethylbenzene	ND	5.00	"							
Methylene chloride	ND	5.00	"							
1,1,2,2-Tetrachloroethane	ND	5.00	"							
Tetrachloroethene	ND	5.00	"							
Toluene	ND	5.00	"							
1,1,1-Trichloroethane	ND	5.00	"							
1,1,2-Trichloroethane	ND	5.00	"							
Trichloroethene	ND	5.00	"							
Vinyl chloride	ND	5.00	"							
o-Xylene	ND	5.00	"							
m,p-Xylene	ND	5.00	"							
2-Hexanone	ND	10.0	"							
4-Methyl-2-pentanone	ND	10.0	"							
Styrene	ND	5.00	"							
Vinyl acetate	ND	5.00	"							
cis-1,2-Dichloroethene	ND	5.00	"							
Surrogate: Dibromofluoromethane	50.9		"	50.0		102	78-136			
Surrogate: 1,2-Dichloroethane-d4	52.4		"	50.0		105	65-139			
Surrogate: Toluene-d8	48.5		"	50.0		97.0	56-130			
Surrogate: 4-Bromofluorobenzene	49.6		"	50.0		99.3	43-130			



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Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41

Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Micro-Methods Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 7G10010 - EPA 5030B

LCS (7G10010-BS1)

Prepared & Analyzed: 07/10/07

Acetone	21.2	10.0	ug/L	20.0		106	71-144			
Benzene	20.4	5.00	"	20.0		102	78-119			
Bromodichloromethane	20.3	5.00	"	20.0		102	69-126			
Bromoform	20.4	5.00	"	20.0		102	61-117			
Bromomethane	18.5	5.00	"	20.0		92.4	70-119			
Carbon Tetrachloride	20.0	5.00	"	20.0		100	62-133			
Chlorobenzene	19.4	5.00	"	20.0		97.2	82-112			
Chloroethane	19.2	5.00	"	20.0		95.8	69-121			
2-Butanone	21.4	10.0	"	20.0		107	76-119			
Chloroform	20.3	5.00	"	20.0		102	79-121			
Carbon disulfide	19.9	5.00	"	20.0		99.3	64-120			
Chloromethane	18.3	5.00	"	20.0		91.4	62-115			
Dibromochloromethane	20.2	5.00	"	20.0		101	68-120			
1,1-Dichloroethane	20.1	5.00	"	20.0		100	76-121			
1,2-Dichloroethane	20.8	5.00	"	20.0		104	80-120			
1,1-Dichloroethene	19.8	5.00	"	20.0		98.8	70-120			
trans-1,2-Dichloroethene	19.9	5.00	"	20.0		99.7	69-131			
1,2-Dichloropropane	20.1	5.00	"	20.0		101	78-118			
cis-1,3-Dichloropropene	19.9	5.00	"	20.0		99.4	71-118			
trans-1,3-Dichloropropene	20.5	5.00	"	20.0		102	70-115			
Ethylbenzene	18.8	5.00	"	20.0		94.1	78-113			
Methylene chloride	20.1	5.00	"	20.0		101	68-138			
1,1,2,2-Tetrachloroethane	20.3	5.00	"	20.0		102	80-113			
Tetrachloroethene	21.4	5.00	"	20.0		107	52-158			
Toluene	20.1	5.00	"	20.0		100	73-124			
1,1,1-Trichloroethane	20.1	5.00	"	20.0		100	72-124			
1,1,2-Trichloroethane	20.4	5.00	"	20.0		102	78-120			
Trichloroethene	20.4	5.00	"	20.0		102	75-120			
Vinyl chloride	19.2	5.00	"	20.0		95.9	63-114			
o-Xylene	19.6	5.00	"	20.0		97.8	75-112			
m,p-Xylene	38.1	5.00	"	40.0		95.2	76-114			
2-Hexanone	19.9	10.0	"	20.0		99.3	59-120			
4-Methyl-2-pentanone	22.4	10.0	"	20.0		112	62-123			
Styrene	19.5	5.00	"	20.0		97.7	76-110			
Vinyl acetate	20.1	5.00	"	20.0		100	69-129			
cis-1,2-Dichloroethene	19.9	5.00	"	20.0		99.6	76-118			
Surrogate: Dibromofluoromethane	50.6		"	50.0		101	78-136			
Surrogate: 1,2-Dichloroethane-d4	56.4		"	50.0		113	65-139			
Surrogate: Toluene-d8	48.9		"	50.0		97.8	56-130			
Surrogate: 4-Bromofluorobenzene	48.2		"	50.0		96.3	43-130			



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 3360 Capital Circle NE Suite B
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Project: Gulfport, NCBC CTO 41

Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Micro-Methods Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 7G10010 - EPA 5030B

LCS Dup (7G10010-BSD1)

Prepared & Analyzed: 07/10/07

Acetone	21.4	10.0	ug/L	20.0		107	71-144	0.610	35	
Benzene	19.5	5.00	"	20.0		97.3	78-119	4.77	35	
Bromodichloromethane	19.8	5.00	"	20.0		99.0	69-126	2.59	35	
Bromoform	20.2	5.00	"	20.0		101	61-117	0.591	35	
Bromomethane	17.8	5.00	"	20.0		88.8	70-119	3.97	35	
Carbon Tetrachloride	18.9	5.00	"	20.0		94.7	62-133	5.64	35	
Chlorobenzene	18.6	5.00	"	20.0		93.2	82-112	4.10	35	
2-Butanone	21.9	10.0	"	20.0		110	76-119	2.22	35	
Chloroethane	18.0	5.00	"	20.0		90.2	69-121	6.02	35	
Chloroform	19.7	5.00	"	20.0		98.4	79-121	3.25	35	
Carbon disulfide	19.1	5.00	"	20.0		95.6	64-120	3.85	35	
Chloromethane	18.2	5.00	"	20.0		91.0	62-115	0.384	35	
Dibromochloromethane	19.9	5.00	"	20.0		99.6	68-120	1.25	35	
1,1-Dichloroethane	19.6	5.00	"	20.0		98.1	76-121	2.42	35	
1,2-Dichloroethane	20.0	5.00	"	20.0		99.8	80-120	4.12	35	
1,1-Dichloroethene	18.7	5.00	"	20.0		93.4	70-120	5.62	35	
trans-1,2-Dichloroethene	19.5	5.00	"	20.0		97.6	69-131	2.08	35	
1,2-Dichloropropane	19.7	5.00	"	20.0		98.6	78-118	2.01	35	
cis-1,3-Dichloropropene	19.6	5.00	"	20.0		97.8	71-118	1.57	35	
trans-1,3-Dichloropropene	19.9	5.00	"	20.0		99.6	70-115	2.82	35	
Ethylbenzene	18.0	5.00	"	20.0		90.0	78-113	4.45	35	
Methylene chloride	20.1	5.00	"	20.0		100	68-138	0.298	35	
1,1,2,2-Tetrachloroethane	20.5	5.00	"	20.0		102	80-113	0.980	35	
Tetrachloroethene	22.2	5.00	"	20.0		111	52-158	3.68	35	
Toluene	20.0	5.00	"	20.0		100	73-124	0.349	35	
1,1,1-Trichloroethane	19.7	5.00	"	20.0		98.3	72-124	2.06	35	
1,1,2-Trichloroethane	20.3	5.00	"	20.0		101	78-120	0.738	35	
Trichloroethene	19.6	5.00	"	20.0		98.2	75-120	3.50	35	
Vinyl chloride	19.0	5.00	"	20.0		94.8	63-114	1.21	35	
o-Xylene	19.0	5.00	"	20.0		95.2	75-112	2.59	35	
m,p-Xylene	36.8	5.00	"	40.0		92.1	76-114	3.23	35	
2-Hexanone	20.5	10.0	"	20.0		102	59-120	3.03	35	
4-Methyl-2-pentanone	20.8	10.0	"	20.0		104	62-123	7.08	35	
Styrene	19.0	5.00	"	20.0		95.2	76-110	2.64	35	
Vinyl acetate	20.0	5.00	"	20.0		99.8	69-129	0.699	35	
cis-1,2-Dichloroethene	18.6	5.00	"	20.0		92.8	76-118	7.07	35	
Surrogate: Dibromofluoromethane	51.1		"	50.0		102	78-136			
Surrogate: 1,2-Dichloroethane-d4	52.7		"	50.0		105	65-139			
Surrogate: Toluene-d8	48.9		"	50.0		97.8	56-130			
Surrogate: 4-Bromofluorobenzene	49.2		"	50.0		98.3	43-130			

Tetra Tech NUS, Inc.
3360 Capital Circle NE Suite B
Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41

Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Micro-Methods Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 7G13013 - EPA 5030B

Blank (7G13013-BLK1)

Prepared & Analyzed: 07/13/07

Acetone	ND	10.0	ug/L							
Benzene	ND	5.00	"							
Bromodichloromethane	ND	5.00	"							
Bromoform	ND	5.00	"							
Bromomethane	ND	5.00	"							
Carbon Tetrachloride	ND	5.00	"							
Chlorobenzene	ND	5.00	"							
Chloroethane	ND	5.00	"							
2-Butanone	ND	10.0	"							
Chloroform	ND	5.00	"							
Carbon disulfide	ND	5.00	"							
Chloromethane	ND	5.00	"							
Dibromochloromethane	ND	5.00	"							
1,1-Dichloroethane	ND	5.00	"							
1,2-Dichloroethane	ND	5.00	"							
1,1-Dichloroethene	ND	5.00	"							
trans-1,2-Dichloroethene	ND	5.00	"							
1,2-Dichloropropane	ND	5.00	"							
cis-1,3-Dichloropropene	ND	5.00	"							
trans-1,3-Dichloropropene	ND	5.00	"							
Ethylbenzene	ND	5.00	"							
Methylene chloride	ND	5.00	"							
1,1,2,2-Tetrachloroethane	ND	5.00	"							
Tetrachloroethene	ND	5.00	"							
Toluene	ND	5.00	"							
1,1,1-Trichloroethane	ND	5.00	"							
1,1,2-Trichloroethane	ND	5.00	"							
Trichloroethene	ND	5.00	"							
Vinyl chloride	ND	5.00	"							
o-Xylene	ND	5.00	"							
m,p-Xylene	ND	5.00	"							
2-Hexanone	ND	10.0	"							
4-Methyl-2-pentanone	ND	10.0	"							
Styrene	ND	5.00	"							
Vinyl acetate	ND	5.00	"							
cis-1,2-Dichloroethene	ND	5.00	"							
Surrogate: Dibromofluoromethane	51.6		"	50.0		103	78-136			
Surrogate: 1,2-Dichloroethane-d4	48.8		"	50.0		97.6	65-139			
Surrogate: Toluene-d8	51.0		"	50.0		102	56-130			
Surrogate: 4-Bromofluorobenzene	48.8		"	50.0		97.6	43-130			



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 3360 Capital Circle NE Suite B
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Project: Gulfport, NCBC CTO 41

Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Micro-Methods Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 7G13013 - EPA 5030B

LCS (7G13013-BS1)

Prepared & Analyzed: 07/13/07

Acetone	20.5	10.0	ug/L	20.0		102	71-144			
Benzene	19.3	5.00	"	20.0		96.5	78-119			
Bromodichloromethane	18.9	5.00	"	20.0		94.6	69-126			
Bromoform	20.6	5.00	"	20.0		103	61-117			
Bromomethane	16.8	5.00	"	20.0		83.9	70-119			
Carbon Tetrachloride	18.7	5.00	"	20.0		93.4	62-133			
Chlorobenzene	19.6	5.00	"	20.0		97.9	82-112			
Chloroethane	16.6	5.00	"	20.0		83.0	69-121			
2-Butanone	20.0	10.0	"	20.0		100	76-119			
Chloroform	20.1	5.00	"	20.0		100	79-121			
Carbon disulfide	18.2	5.00	"	20.0		90.8	64-120			
Chloromethane	16.1	5.00	"	20.0		80.6	62-115			
Dibromochloromethane	19.9	5.00	"	20.0		99.3	68-120			
1,1-Dichloroethane	19.7	5.00	"	20.0		98.6	76-121			
1,2-Dichloroethane	19.8	5.00	"	20.0		98.8	80-120			
1,1-Dichloroethene	18.7	5.00	"	20.0		93.4	70-120			
trans-1,2-Dichloroethene	18.4	5.00	"	20.0		92.0	69-131			
1,2-Dichloropropane	19.4	5.00	"	20.0		97.0	78-118			
cis-1,3-Dichloropropene	19.5	5.00	"	20.0		97.3	71-118			
trans-1,3-Dichloropropene	19.9	5.00	"	20.0		99.5	70-115			
Ethylbenzene	19.0	5.00	"	20.0		94.9	78-113			
Methylene chloride	19.4	5.00	"	20.0		96.9	68-138			
1,1,2,2-Tetrachloroethane	20.5	5.00	"	20.0		102	80-113			
Tetrachloroethene	17.1	5.00	"	20.0		85.4	52-158			
Toluene	19.2	5.00	"	20.0		96.2	73-124			
1,1,1-Trichloroethane	19.1	5.00	"	20.0		95.7	72-124			
1,1,2-Trichloroethane	20.4	5.00	"	20.0		102	78-120			
Trichloroethene	20.1	5.00	"	20.0		100	75-120			
Vinyl chloride	17.1	5.00	"	20.0		85.5	63-114			
o-Xylene	19.6	5.00	"	20.0		98.2	75-112			
m,p-Xylene	37.3	5.00	"	40.0		93.2	76-114			
2-Hexanone	20.4	10.0	"	20.0		102	59-120			
4-Methyl-2-pentanone	22.3	10.0	"	20.0		112	62-123			
Styrene	19.5	5.00	"	20.0		97.6	76-110			
Vinyl acetate	20.0	5.00	"	20.0		100	69-129			
cis-1,2-Dichloroethene	19.7	5.00	"	20.0		98.6	76-118			
Surrogate: Dibromofluoromethane	50.6		"	50.0		101	78-136			
Surrogate: 1,2-Dichloroethane-d4	49.6		"	50.0		99.1	65-139			
Surrogate: Toluene-d8	48.4		"	50.0		96.8	56-130			
Surrogate: 4-Bromofluorobenzene	49.2		"	50.0		98.4	43-130			



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Project: Gulfport, NCBC CTO 41

Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Micro-Methods Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 7G13013 - EPA 5030B

LCS Dup (7G13013-BSD1)

Prepared & Analyzed: 07/13/07

Acetone	19.8	10.0	ug/L	20.0		99.2	71-144	3.13	35	
Benzene	20.0	5.00	"	20.0		100	78-119	3.61	35	
Bromodichloromethane	19.6	5.00	"	20.0		97.8	69-126	3.27	35	
Bromoform	20.8	5.00	"	20.0		104	61-117	1.01	35	
Bromomethane	18.2	5.00	"	20.0		91.0	70-119	8.12	35	
Carbon Tetrachloride	19.9	5.00	"	20.0		99.6	62-133	6.43	35	
Chlorobenzene	20.0	5.00	"	20.0		100	82-112	2.37	35	
Chloroethane	17.4	5.00	"	20.0		86.8	69-121	4.47	35	
2-Butanone	20.5	10.0	"	20.0		103	76-119	2.47	35	
Chloroform	20.0	5.00	"	20.0		100	79-121	0.249	35	
Carbon disulfide	18.8	5.00	"	20.0		94.2	64-120	3.68	35	
Chloromethane	17.6	5.00	"	20.0		88.1	62-115	8.83	35	
Dibromochloromethane	20.5	5.00	"	20.0		102	68-120	3.03	35	
1,1-Dichloroethane	20.7	5.00	"	20.0		103	76-121	4.75	35	
1,2-Dichloroethane	20.3	5.00	"	20.0		102	80-120	2.84	35	
1,1-Dichloroethene	18.9	5.00	"	20.0		94.6	70-120	1.17	35	
trans-1,2-Dichloroethene	19.4	5.00	"	20.0		97.2	69-131	5.50	35	
1,2-Dichloropropane	19.9	5.00	"	20.0		99.5	78-118	2.54	35	
cis-1,3-Dichloropropene	19.7	5.00	"	20.0		98.7	71-118	1.43	35	
trans-1,3-Dichloropropene	20.2	5.00	"	20.0		101	70-115	1.35	35	
Ethylbenzene	19.7	5.00	"	20.0		98.7	78-113	3.93	35	
Methylene chloride	20.4	5.00	"	20.0		102	68-138	5.03	35	
1,1,2,2-Tetrachloroethane	20.8	5.00	"	20.0		104	80-113	1.41	35	
Tetrachloroethene	20.5	5.00	"	20.0		103	52-158	18.4	35	
Toluene	20.0	5.00	"	20.0		100	73-124	3.77	35	
1,1,1-Trichloroethane	19.9	5.00	"	20.0		99.4	72-124	3.74	35	
1,1,2-Trichloroethane	20.7	5.00	"	20.0		103	78-120	1.07	35	
Trichloroethene	19.9	5.00	"	20.0		99.7	75-120	0.749	35	
Vinyl chloride	18.6	5.00	"	20.0		93.1	63-114	8.51	35	
o-Xylene	20.2	5.00	"	20.0		101	75-112	3.01	35	
m,p-Xylene	38.2	5.00	"	40.0		95.6	76-114	2.49	35	
2-Hexanone	21.0	10.0	"	20.0		105	59-120	2.94	35	
4-Methyl-2-pentanone	21.9	10.0	"	20.0		110	62-123	1.81	35	
Styrene	20.0	5.00	"	20.0		99.8	76-110	2.33	35	
Vinyl acetate	18.4	5.00	"	20.0		92.1	69-129	8.27	35	
cis-1,2-Dichloroethene	20.4	5.00	"	20.0		102	76-118	3.59	35	
Surrogate: Dibromofluoromethane	50.9		"	50.0		102	78-136			
Surrogate: 1,2-Dichloroethane-d4	50.5		"	50.0		101	65-139			
Surrogate: Toluene-d8	47.6		"	50.0		95.2	56-130			
Surrogate: 4-Bromofluorobenzene	49.4		"	50.0		98.8	43-130			

Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41

Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Micro-Methods Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 7G13013 - EPA 5030B

Duplicate (7G13013-DUP1)	Source: 0707014-10			Prepared & Analyzed: 07/13/07						
cis-1,2-Dichloroethene	366	50.0	ug/L	377				2.83	40	E-01
Surrogate: Dibromofluoromethane	51.4		"	50.0		103	78-136			
Surrogate: 1,2-Dichloroethane-d4	49.9		"	50.0		99.7	65-139			
Surrogate: Toluene-d8	49.5		"	50.0		99.0	56-130			
Surrogate: 4-Bromofluorobenzene	47.6		"	50.0		95.1	43-130			

Matrix Spike (7G13013-MS1)	Source: 0707014-10			Prepared & Analyzed: 07/13/07						
Acetone	36.2	10.0	ug/L	20.0	13.9	111	57-153			
Benzene	20.8	5.00	"	20.0	ND	104	74-127			
Bromodichloromethane	19.7	5.00	"	20.0	ND	98.4	71-123			
Bromoform	21.1	5.00	"	20.0	ND	105	57-118			
Bromomethane	17.1	5.00	"	20.0	ND	85.4	64-124			
Carbon Tetrachloride	20.4	5.00	"	20.0	ND	102	54-142			
Chlorobenzene	20.0	5.00	"	20.0	ND	100	72-119			
Chloroethane	17.5	5.00	"	20.0	ND	87.4	63-128			
2-Butanone	20.8	10.0	"	20.0	ND	104	73-125			
Chloroform	20.2	5.00	"	20.0	ND	101	70-135			
Carbon disulfide	18.4	5.00	"	20.0	ND	91.8	61-127			
Chloromethane	16.9	5.00	"	20.0	ND	84.4	52-126			
Dibromochloromethane	20.5	5.00	"	20.0	ND	103	64-124			
1,1-Dichloroethane	20.0	5.00	"	20.0	ND	100	74-125			
1,2-Dichloroethane	21.1	5.00	"	20.0	ND	105	75-127			
1,1-Dichloroethene	19.6	5.00	"	20.0	ND	97.8	67-126			
trans-1,2-Dichloroethene	81.1	5.00	"	20.0	65.7	77.0	69-131			
1,2-Dichloropropane	19.8	5.00	"	20.0	ND	98.9	76-120			
cis-1,3-Dichloropropene	19.4	5.00	"	20.0	ND	97.2	66-122			
trans-1,3-Dichloropropene	20.0	5.00	"	20.0	ND	100	70-117			
Ethylbenzene	19.3	5.00	"	20.0	ND	96.3	75-118			
Methylene chloride	19.4	5.00	"	20.0	ND	97.0	73-130			
1,1,2,2-Tetrachloroethane	21.3	5.00	"	20.0	ND	106	80-121			
Tetrachloroethene	15.4	5.00	"	20.0	ND	76.8	59-131			
Toluene	19.8	5.00	"	20.0	ND	99.2	77-121			
1,1,1-Trichloroethane	19.6	5.00	"	20.0	ND	98.2	70-128			
1,1,2-Trichloroethane	20.8	5.00	"	20.0	ND	104	77-124			
Trichloroethene	38.6	5.00	"	20.0	21.2	87.1	69-126			
Vinyl chloride	45.2	5.00	"	20.0	29.4	79.0	58-121			
o-Xylene	20.0	5.00	"	20.0	ND	100	72-114			
m,p-Xylene	38.0	5.00	"	40.0	ND	94.9	68-119			
2-Hexanone	22.7	10.0	"	20.0	ND	113	40-145			
4-Methyl-2-pentanone	23.3	10.0	"	20.0	ND	117	68-128			
Styrene	19.4	5.00	"	20.0	ND	97.0	71-113			
Vinyl acetate	21.5	5.00	"	20.0	ND	108	70-123			
Surrogate: Dibromofluoromethane	51.5		"	50.0		103	78-136			

Tetra Tech NUS, Inc.
3360 Capital Circle NE Suite B
Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Micro-Methods Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 7G13013 - EPA 5030B

Matrix Spike (7G13013-MS1)

Source: 0707014-10

Prepared & Analyzed: 07/13/07

Surrogate: 1,2-Dichloroethane-d4	50.2		ug/L	50.0		100	65-139			
Surrogate: Toluene-d8	50.5		"	50.0		101	56-130			
Surrogate: 4-Bromofluorobenzene	50.1		"	50.0		100	43-130			

Matrix Spike Dup (7G13013-MSD1)

Source: 0707014-10

Prepared & Analyzed: 07/13/07

Acetone	36.4	10.0	ug/L	20.0	13.9	113	57-153	0.716	40	
Benzene	21.9	5.00	"	20.0	ND	110	74-127	5.20	40	
Bromodichloromethane	19.4	5.00	"	20.0	ND	97.2	71-123	1.28	40	
Bromoform	20.7	5.00	"	20.0	ND	103	57-118	1.82	40	
Bromomethane	17.4	5.00	"	20.0	ND	87.2	64-124	2.03	40	
Carbon Tetrachloride	19.7	5.00	"	20.0	ND	98.5	54-142	3.74	40	
Chlorobenzene	19.6	5.00	"	20.0	ND	97.8	72-119	2.47	40	
Chloroethane	18.4	5.00	"	20.0	ND	91.8	63-128	4.91	40	
2-Butanone	21.2	10.0	"	20.0	ND	106	73-125	1.57	40	
Chloroform	19.5	5.00	"	20.0	ND	97.6	70-135	3.62	40	
Carbon disulfide	19.0	5.00	"	20.0	ND	95.2	61-127	3.69	40	
Chloromethane	18.0	5.00	"	20.0	ND	90.2	52-126	6.58	40	
Dibromochloromethane	20.6	5.00	"	20.0	ND	103	64-124	0.146	40	
1,1-Dichloroethane	20.6	5.00	"	20.0	ND	103	74-125	2.71	40	
1,2-Dichloroethane	21.2	5.00	"	20.0	ND	106	75-127	0.662	40	
1,1-Dichloroethene	19.7	5.00	"	20.0	ND	98.4	67-126	0.662	40	
trans-1,2-Dichloroethene	83.6	5.00	"	20.0	65.7	89.3	69-131	3.00	40	
1,2-Dichloropropane	19.6	5.00	"	20.0	ND	98.0	76-120	0.914	40	
cis-1,3-Dichloropropene	19.3	5.00	"	20.0	ND	96.4	66-122	0.878	40	
trans-1,3-Dichloropropene	20.5	5.00	"	20.0	ND	102	70-117	2.27	40	
Ethylbenzene	18.9	5.00	"	20.0	ND	94.4	75-118	1.99	40	
Methylene chloride	19.9	5.00	"	20.0	ND	99.6	73-130	2.64	40	
1,1,2,2-Tetrachloroethane	20.7	5.00	"	20.0	ND	104	80-121	2.71	40	
Tetrachloroethene	15.8	5.00	"	20.0	ND	79.0	59-131	2.82	40	
Toluene	19.8	5.00	"	20.0	ND	99.0	77-121	0.202	40	
1,1,1-Trichloroethane	19.7	5.00	"	20.0	ND	98.3	70-128	0.102	40	
1,1,2-Trichloroethane	21.1	5.00	"	20.0	ND	106	77-124	1.53	40	
Trichloroethene	38.7	5.00	"	20.0	21.2	87.6	69-126	0.259	40	
Vinyl chloride	46.5	5.00	"	20.0	29.4	85.6	58-121	2.88	40	
o-Xylene	19.5	5.00	"	20.0	ND	97.6	72-114	2.58	40	
m,p-Xylene	36.5	5.00	"	40.0	ND	91.2	68-119	4.00	40	
2-Hexanone	21.6	10.0	"	20.0	ND	108	40-145	4.74	40	
4-Methyl-2-pentanone	21.8	10.0	"	20.0	ND	109	68-128	6.65	40	
Styrene	19.0	5.00	"	20.0	ND	94.9	71-113	2.19	40	
Vinyl acetate	22.0	5.00	"	20.0	ND	110	70-123	2.30	40	
Surrogate: Dibromofluoromethane	51.6		"	50.0		103	78-136			
Surrogate: 1,2-Dichloroethane-d4	49.7		"	50.0		99.5	65-139			
Surrogate: Toluene-d8	48.2		"	50.0		96.3	56-130			



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Tetra Tech NUS, Inc.
 3360 Capital Circle NE Suite B
 Tallahassee FL, 32308

Project: Gulfport, NCBC CTO 41
 Project Number: [none]
 Project Manager: Bob Fisher

Reported:
 07/16/07 08:55

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Micro-Methods Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 7G13013 - EPA 5030B

Matrix Spike Dup (7G13013-MSD1)

Source: 0707014-10

Prepared & Analyzed: 07/13/07

<i>Surrogate: 4-Bromofluorobenzene</i>	48.7		ug/L	50.0		97.4	43-130			
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Tetra Tech NUS, Inc.
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Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

Certified Analyses included in this Report

Analyte	Certifications
EPA 8260B in Water	
Acetone	LELAP,NELAP
Acrolein	LELAP,NELAP
Acrylonitrile	LELAP,NELAP
Benzene	LELAP,NELAP
Bromodichloromethane	LELAP,NELAP
Bromobenzene	LELAP,NELAP
Bromochloromethane	LELAP,NELAP
Bromoform	LELAP,NELAP
Bromomethane	LELAP,NELAP
Carbon Tetrachloride	LELAP,NELAP
Chlorobenzene	LELAP,NELAP
2-Butanone	LELAP,NELAP
Chloroethane	LELAP,NELAP
2-Chloroethylvinyl ether	LELAP,NELAP
Carbon disulfide	LELAP,NELAP
Chloroform	LELAP,NELAP
Chloromethane	LELAP,NELAP
Dibromochloromethane	LELAP,NELAP
1,2-Dichlorobenzene	LELAP,NELAP
1,3-Dichlorobenzene	LELAP,NELAP
1,4-Dichlorobenzene	LELAP,NELAP
1,1-Dichloroethane	LELAP,NELAP
2-Chlorotoluene	LELAP,NELAP
4-Chlorotoluene	LELAP,NELAP
Dichlorodifluoromethane	LELAP,NELAP
1,2-Dibromo-3-chloropropane	LELAP,NELAP
1,2-Dichloroethane	LELAP,NELAP
1,1-Dichloroethene	LELAP,NELAP
1,2-Dibromoethane (EDB)	LELAP,NELAP
Dibromomethane	LELAP,NELAP
trans-1,2-Dichloroethene	LELAP,NELAP
1,2-Dichloropropane	LELAP,NELAP
cis-1,3-Dichloropropene	LELAP,NELAP
trans-1,3-Dichloropropene	LELAP,NELAP
cis-1,4-Dichloro-2-butene	LELAP,NELAP
Ethylbenzene	LELAP,NELAP
Methylene chloride	LELAP,NELAP

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Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

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07/16/07 08:55

trans-1,4-Dichloro-2-butene	LELAP,NELAP
1,1,2,2-Tetrachloroethane	LELAP,NELAP
Tetrachloroethene	LELAP,NELAP
Toluene	LELAP,NELAP
1,1,1-Trichloroethane	LELAP,NELAP
1,1,2-Trichloroethane	LELAP,NELAP
1,3-Dichloropropane	LELAP,NELAP
2,2-Dichloropropane	LELAP,NELAP
Trichloroethene	LELAP,NELAP
1,1-Dichloropropene	LELAP,NELAP
Trichlorofluoromethane	LELAP,NELAP
Vinyl chloride	LELAP,NELAP
Diethyl ether	LELAP,NELAP
o-Xylene	LELAP,NELAP
1,4-Dioxane	LELAP,NELAP
m,p-Xylene	LELAP,NELAP
Hexachlorobutadiene	LELAP,NELAP
2-Hexanone	LELAP,NELAP
Iodomethane	LELAP,NELAP
4-Isopropyltoluene	LELAP,NELAP
Isopropylbenzene	LELAP,NELAP
4-Methyl-2-pentanone	LELAP,NELAP
Naphthalene	LELAP,NELAP
Styrene	LELAP,NELAP
1,1,2-Trichlorotrifluoroethane	LELAP,NELAP
1,2,3-Trichlorobenzene	LELAP,NELAP
1,2,4- Trimethylbenzene	LELAP,NELAP
1,3,5-Trimethylbenzene	LELAP,NELAP
1,1,1,2-Tetrachloroethane	LELAP,NELAP
Tert-butyl alcohol	LELAP,NELAP
Hexane	LELAP,NELAP
1,2,4-Trichlorobenzene	LELAP,NELAP
Methyl tert-Butyl Ether	LELAP,NELAP
n-Butylbenzene	LELAP,NELAP
n-Propyl Benzene	LELAP,NELAP
1,2,3-Trichloropropane	LELAP,NELAP
sec-Butyl Benzene	LELAP,NELAP
Vinyl acetate	LELAP,NELAP
t-Butyl Benzene	LELAP,NELAP
Tetrahydrofuran	LELAP,NELAP
cis-1,2-Dichloroethene	LELAP,NELAP
Dibromofluoromethane	LELAP,NELAP



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Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

Code	Description	Number	Expires
LELAP	LA Enviro Lab Accreditation Program	01960	06/30/2008
NELAP	National Enviro Lab Accreditation Program		06/30/2008



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Project: Gulfport, NCBC CTO 41
Project Number: [none]
Project Manager: Bob Fisher

Reported:
07/16/07 08:55

Notes and Definitions

E-01 The concentration for this analyte is above the calibration range of the instrument. Results are from a secondary dilution.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

RPD Relative Percent Difference

1062

Micro-Methods Lab, Inc. 6500 Sunplex Drive, Ocean Springs, MS 39564 Ph: 228-875-6420 • Fax: 228-875-6423		Chain of Custody / Analysis Request Form Print ALL Information. Put N/A in blanks not applicable			Field pH: _____ Tech: <u>BK</u> Time: <u>0915</u> Field Temperature: _____ Iced: <input checked="" type="checkbox"/> Yes No <u>0.4°C</u> Sample Receipt Temperature: <u>Cooler temp</u>				
REPORT RESULTS TO:		SEND INVOICE TO:		TURNAROUND TIME					
Company: <u>TIVUS</u>		Company: <u>Pittsburg</u> PO#: <u>CTO-0041</u>		Date Results needed by: <u>7-12-07</u>					
Name: <u>Bob Fisher</u>		Name: _____		Standard turnaround time is 10 working days <input type="checkbox"/>					
Address <u>3360 Capital Circle NE Suite B</u>		Address _____		The following turnaround times require lab approval:					
City <u>Tallahassee</u>		City _____		<input checked="" type="checkbox"/> 7-10 days <input type="checkbox"/> 72 Hrs <input type="checkbox"/> 48 Hrs					
State <u>Florida</u> ZIP <u>32308</u>		State _____ ZIP _____		<input type="checkbox"/> 24 Hrs Approved by _____					
TEL: <u>850-385-9899</u> FAX: <u>850-385-9800</u>		TEL: _____ FAX: _____							
Sampled by: (Signature) _____ (Print) <u>J.D. Spalding</u>		Project Name: <u>Gulfport, NCRC CTO 41</u>		Date of Sample Shipment: <u>7-2-07</u>					
Failure to complete shaded areas will hinder processing of samples.				Sampling		List Test Needed			
For Lab Use Only		<u>W0# 0707014</u>		C O M P		# CONTAINERS			
Sample Number		Station Location / Sample ID		G R A B					
		DATE TIME		<u>VOC 8260 B</u>					
1.		<u>GPT-03-086W-001</u>		<u>7-1-07 1145</u>		<u>3</u>			
2.		<u>GPT-03-096W-001</u>		<u>7-1-07 1545</u>		}			
3.		<u>GPT-03-106W-001</u>		<u>7-1-07 1530</u>					
4.		<u>GPT-03-116W-001</u>		<u>7-1-07 1735</u>					
5.		<u>GPT-03-126W-001</u>		<u>7-1-07 1745</u>					
6.		<u>GPT-03-136W-001</u>		<u>7-1-07 2030</u>					
7.		<u>GPT-03-136W-001D</u>		<u>7-1-07 2030</u>					
8.		<u>GPT-03-146W-001B</u>		<u>7-1-07 2035</u>					
9.		<u>GPT-03-156W-001</u>		<u>7-2-07 1015</u>					
10.		<u>GPT-03-166W-001</u>		<u>7-2-07 0950</u>				<u>3</u>	
Released By Signature _____		Date & Time Released <u>7-2-07/1600</u>		Received By Signature <u>Brandimarch</u>				Date & Time Received <u>7-3-07</u>	
Printed Name <u>James D Spalding</u>		<u>7-2-07/1600</u>		Printed Name <u>Brandimarch</u>		<u>0915</u>			
Released By Signature _____		Date & Time Released _____		Received By Signature _____		Date & Time Received _____			
Printed Name _____		_____		Printed Name _____		_____			
Please indicate reporting requirements: <input type="checkbox"/> 1. Results Only (EPA Level I) <input type="checkbox"/> 2. Results & QC (EPA Level II) <input type="checkbox"/> 3. Results, QC and Raw Data (EPA Level III)									

202

Micro-Methods Lab, Inc. 6500 Sunplex Drive, Ocean Springs, MS 39564 Ph: 228-875-6420 • Fax: 228-875-6423	Chain of Custody / Analysis Request Form Print ALL Information. Put N/A in blanks not applicable	Field pH: _____ Tech: <i>BA</i> Time: <i>0915</i> Field Temperature: <i>0.4°C</i> Iced: <input checked="" type="checkbox"/> No Sample Receipt Temperature: <i>Temp at cooler</i>
---	--	---

REPORT RESULTS TO:	SEND INVOICE TO:	TURNAROUND TIME
Company: <i>Tetra Tech NVS</i>	Company: _____ PO#: <i>CTO-0041</i>	Date Results needed by: <i>7-12-07</i>
Name: <i>Bob Fisher</i>	Name: <i>Pittsburgh</i>	Standard turnaround time is 10 working days <input type="checkbox"/>
Address: <i>3360 Capital Circle NE</i>	Address: _____	The following turnaround times require lab approval:
City: <i>Tallahassee</i>	City: _____	<input checked="" type="checkbox"/> 7-10 days <input type="checkbox"/> 72 Hrs <input type="checkbox"/> 48 Hrs
State: <i>FL</i> ZIP: <i>32308</i>	State: _____ ZIP: _____	<input type="checkbox"/> 24 Hrs Approved by _____
TEL: <i>850-385-9899</i> FAX: <i>850-385-9860</i>	TEL: _____ FAX: _____	
Sampled by: (Signature) <i>J. Halfhill</i> (Print) <i>Jake Halfhill</i>	Project Name: <i>Gulfport + NCBC CTO-41</i>	Date of Sample Shipment: <i>7-2-07</i>

Failure to complete shaded areas will hinder processing of samples. *07-03-07*

For Lab Use Only	Sample Number	Station Location / Sample ID	DATE	TIME	Sampling		List Test Needed										# CONTAINERS			
					C O M P	G R A B														
		<i>WO# 0706 0707014 for write water</i>																		
	1.	<i>GPT-03-16GW-001 MS</i>	<i>7-2-07</i>	<i>0950</i>			<i>3</i>													<i>3</i>
	2.	<i>GPT-03-16GW-001 MSN</i>	<i>7-2-07</i>	<i>0950</i>			<i>3</i>													<i>3</i>
	3.	<i>GPT-03-17GW-001</i>	<i>7-2-07</i>	<i>1300</i>			<i>3</i>													<i>3</i>
	4.																			
	5.	<i>tripblank +bv #4841</i>	<i>7-1-07</i>	<i>1145</i>			<i>2</i>													<i>2</i>
	6.																			
	7.																			
	8.																			
	9.																			
	10.																			

Released By Signature: <i>J. Halfhill</i>	Date & Time Released: <i>7-2-07 1600</i>	Received By Signature: <i>Brandinchee</i>	Date & Time Received: <i>7-3-07</i>	Please indicate reporting requirements: <input type="checkbox"/> 1. Results Only (EPA Level I) <input type="checkbox"/> 2. Results & QC (EPA Level II) <input type="checkbox"/> 3. Results, QC and Raw Data (EPA Level III)
Printed Name: <i>Jake Halfhill</i>	Date & Time Released: <i>7-2-07 1600</i>	Printed Name: <i>Brandinchee</i>	Date & Time Received: <i>0915</i>	
Released By Signature: _____	Date & Time Released: _____	Received By Signature: _____	Date & Time Received: _____	
Printed Name: _____	Date & Time Released: _____	Printed Name: _____	Date & Time Received: _____	

TO: FISHER, R – PAGE 2
DATE: AUGUST 23, 2007

Notes

The continuing calibration blank analyzed on 07/16/07 at 16:32 in instrument TJA61E TRACE ICP yielded a thallium concentration greater than the instrument detection limit (IDL) affecting all samples. However, the laboratory re-analyzed every thallium sample that yielded a positive result. No thallium contamination was detected during the re-analyses; therefore, no thallium data was qualified due to laboratory blank contamination.

The MS and MSD of sample GPT-03-16GW-001 yielded %Rs less than the lower quality control limit (75%) but greater than 30% for iron; however, because the amount of spike added was less than 4X the original sample concentration, no validation action was required.

The ICP serial dilution of GPT-03-16GW-001 yielded percent differences (%Ds) that were greater than 10% for aluminum, arsenic, potassium, thallium, and zinc; however, because the original concentrations of the aforementioned analytes were not greater than 50X the respective IDLs, no validation action was required.

Originally, non-detected metal results were not reported down to IDLs in the database. The data validator amended the database so that all non-detected metals results are reported down to respective IDLs.

Executive Summary

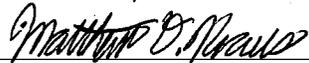
Laboratory Performance: The laboratory did not report non-detected metal results down to instrument detection limits in the electronic data deliverable.

Other Factors Affecting Data Quality: Mercury was qualified due to matrix spike noncompliance.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", October 2004 and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DoD QSM and the Quality Assurance Project Plan (QAPP)."


Tetra Tech NUS
Matthew D. Kraus
Environmental Chemist


Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: M

nsample GPT-03-08GW-001
 samp_date 7/1/2007
 lab_id 0707014-01
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-09GW-001
 samp_date 7/1/2007
 lab_id 0707014-02
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-10GW-001
 samp_date 7/1/2007
 lab_id 0707014-03
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	218		
ANTIMONY	5	U	
ARSENIC	10	U	
BARIUM	141		
BERYLLIUM	1	U	
CADMIUM	1	U	
CALCIUM	4800		
CHROMIUM	2	U	
COBALT	5.2		
COPPER	5	U	
IRON	3050		
LEAD	1.5	U	
MAGNESIUM	4390		
MANGANESE	86.6		
MERCURY	0.08	UJ	D
NICKEL	7		
POTASSIUM	1640		
SELENIUM	3	U	
SILVER	1	U	
SODIUM	11800		
THALLIUM	3	U	
VANADIUM	5	U	
ZINC	28		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	348		
ANTIMONY	5	U	
ARSENIC	3	U	
BARIUM	80.8		
BERYLLIUM	1	U	
CADMIUM	1	U	
CALCIUM	10700		
CHROMIUM	2	U	
COBALT	5	U	
COPPER	5	U	
IRON	3520		
LEAD	1.5	U	
MAGNESIUM	3910		
MANGANESE	94.7		
MERCURY	0.08	UJ	D
NICKEL	5	U	
POTASSIUM	1590		
SELENIUM	3	U	
SILVER	1	U	
SODIUM	16200		
THALLIUM	3	U	
VANADIUM	5	U	
ZINC	10.7		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	978		
ANTIMONY	5	U	
ARSENIC	186		
BARIUM	116		
BERYLLIUM	1	U	
CADMIUM	1	U	
CALCIUM	19000		
CHROMIUM	2.2		
COBALT	5	U	
COPPER	5	U	
IRON	13100		
LEAD	1.8		
MAGNESIUM	6670		
MANGANESE	174		
MERCURY	0.08	UJ	D
NICKEL	5	U	
POTASSIUM	1710		
SELENIUM	3	U	
SILVER	1	U	
SODIUM	20400		
THALLIUM	3	U	
VANADIUM	5	U	
ZINC	28.9		

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: M

nsample GPT-03-11GW-001
 samp_date 7/1/2007
 lab_id 0707014-04
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-12GW-001
 samp_date 7/1/2007
 lab_id 0707014-05
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-13GW-001
 samp_date 7/1/2007
 lab_id 0707014-06
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	190		
ANTIMONY	5	U	
ARSENIC	287		
BARIUM	127		
BERYLLIUM	1.1		
CADMIUM	1	U	
CALCIUM	12100		
CHROMIUM	2	U	
COBALT	5	U	
COPPER	5	U	
IRON	3980		
LEAD	1.5	U	
MAGNESIUM	5240		
MANGANESE	101		
MERCURY	0.08	UJ	D
NICKEL	5	U	
POTASSIUM	1570		
SELENIUM	3	U	
SILVER	10	U	
SODIUM	17000		
THALLIUM	3	U	
VANADIUM	5	U	
ZINC	8.7		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	654		
ANTIMONY	5	U	
ARSENIC	3	U	
BARIUM	50		
BERYLLIUM	1	U	
CADMIUM	1	U	
CALCIUM	6420		
CHROMIUM	2	U	
COBALT	5	U	
COPPER	5	U	
IRON	3120		
LEAD	1.5	U	
MAGNESIUM	2200		
MANGANESE	46.3		
MERCURY	0.08	UJ	D
NICKEL	5	U	
POTASSIUM	1000	U	
SELENIUM	3	U	
SILVER	1	U	
SODIUM	7630		
THALLIUM	3	U	
VANADIUM	5	U	
ZINC	5	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	2830		
ANTIMONY	5	U	
ARSENIC	18.4		
BARIUM	42.5		
BERYLLIUM	1	U	
CADMIUM	1	U	
CALCIUM	2610		
CHROMIUM	3.7		
COBALT	5	U	
COPPER	5	U	
IRON	4100		
LEAD	1.5	U	
MAGNESIUM	1230		
MANGANESE	31.8		
MERCURY	0.08	UJ	D
NICKEL	5	U	
POTASSIUM	1000	U	
SELENIUM	3	U	
SILVER	1	U	
SODIUM	8960		
THALLIUM	3	U	
VANADIUM	5.3		
ZINC	12.7		

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: M

nsample GPT-03-13GW-001D
 samp_date 7/1/2007
 lab_id 0707014-07
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF: GPT-03-13GW-001

nsample GPT-03-14GW-001
 samp_date 7/1/2007
 lab_id 0707014-08
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-15GW-001
 samp_date 7/2/2007
 lab_id 0707014-09
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	2730		
ANTIMONY	5	U	
ARSENIC	19.9		
BARIUM	43.7		
BERYLLIUM	1	U	
CADMIUM	1	U	
CALCIUM	2700		
CHROMIUM	3.4		
COBALT	5	U	
COPPER	5	U	
IRON	4210		
LEAD	1.5	U	
MAGNESIUM	1270		
MANGANESE	32.7		
MERCURY	0.08	UJ	D
NICKEL	5	U	
POTASSIUM	1000	U	
SELENIUM	3	U	
SILVER	1	U	
SODIUM	9220		
THALLIUM	3	U	
VANADIUM	5	U	
ZINC	12.3		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	3520		
ANTIMONY	5	U	
ARSENIC	15.3		
BARIUM	45.9		
BERYLLIUM	1	U	
CADMIUM	1	U	
CALCIUM	3560		
CHROMIUM	3.7		
COBALT	5	U	
COPPER	5	U	
IRON	15900		
LEAD	2		
MAGNESIUM	1690		
MANGANESE	98.7		
MERCURY	0.08	UJ	D
NICKEL	5	U	
POTASSIUM	1250		
SELENIUM	3	U	
SILVER	1	U	
SODIUM	5350		
THALLIUM	3	U	
VANADIUM	5	U	
ZINC	5	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	30300		
ANTIMONY	5	U	
ARSENIC	10.6		
BARIUM	115		
BERYLLIUM	1.2		
CADMIUM	1	U	
CALCIUM	6200		
CHROMIUM	22.7		
COBALT	5	U	
COPPER	5	U	
IRON	10800		
LEAD	8.8		
MAGNESIUM	3040		
MANGANESE	83		
MERCURY	0.08	UJ	D
NICKEL	10.2		
POTASSIUM	4100		
SELENIUM	3	U	
SILVER	1	U	
SODIUM	7650		
THALLIUM	3	U	
VANADIUM	28.6		
ZINC	41.7		

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: M

nsample GPT-03-16GW-001
 samp_date 7/2/2007
 lab_id 0707014-10
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-17GW-001
 samp_date 7/2/2007
 lab_id 0707014-11
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	81.3		
ANTIMONY	5	U	
ARSENIC	20		
BARIUM	72.7		
BERYLLIUM	1	U	
CADMIUM	1	U	
CALCIUM	88400		
CHROMIUM	2	U	
COBALT	5	U	
COPPER	5	U	
IRON	25600		
LEAD	1.5	U	
MAGNESIUM	8510		
MANGANESE	211		
MERCURY	0.08	UJ	D
NICKEL	5	U	
POTASSIUM	4580		
SELENIUM	3	U	
SILVER	1	U	
SODIUM	15900		
THALLIUM	3	U	
VANADIUM	5	U	
ZINC	20.6		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	58900		
ANTIMONY	5	U	
ARSENIC	38.2		
BARIUM	98.9		
BERYLLIUM	2.1		
CADMIUM	1	U	
CALCIUM	3940		
CHROMIUM	53.3		
COBALT	5	U	
COPPER	13.7		
IRON	30800		
LEAD	19.4		
MAGNESIUM	2720		
MANGANESE	80.4		
MERCURY	0.18	J	D
NICKEL	18.9		
POTASSIUM	3360		
SELENIUM	8.2		
SILVER	1	U	
SODIUM	12100		
THALLIUM	3	U	
VANADIUM	78.2		
ZINC	34.9		

Semivolatile

The laboratory control sample (LCS) associated with batch SBLK0705BW1 had a percent recovery greater than the quality control limit for 4-nitroaniline. No action was taken on this basis because 4-nitroaniline was not detected in the associated samples.

The matrix spike / matrix spike duplicate (MS/MSD) performed on sample GPT-03-16GW-001 had relative percent differences (RPDs) greater than the quality control limit for 2,4-dinitrophenol and 4-nitrophenol. No action was taken on this basis because the percent recoveries for 2,4-dinitrophenol and 4-nitrophenol were acceptable.

Calibration verification had %Ds that exceeded the 25% quality control limit for atrazine, benzaldehyde and 3,3'-dichlorobenzidine on 07/12/07 @ 07:23. The non-detected results reported for the aforementioned compounds were qualified as estimated (UJ) in all samples.

Organochloride Pesticides

Continuing calibration %Ds exceeded the 15% quality control limit on 07/13/07 @ 19:20 on the primary column for endrin aldehyde and methoxychlor. No qualifiers were assigned on this basis since all compounds were compliant on the secondary column.

Continuing calibration %Ds exceeded the 15% quality control limit on 07/14/07 @ 00:36 on the secondary column for 4,4'-DDE and 4,4'-DDD. No qualifiers were assigned on this basis since all compounds were compliant on the primary column.

A continuing calibration %D exceeded the 15% quality control limit on 07/14/07 @ 03:04 on the primary column for endrin aldehyde. The confirmation column had %Ds outside the quality control limit for 4,4'-DDD and 4,4'-DDT. No action was taken on this basis since all compounds were compliant on either the primary or secondary column.

PCBs

The MS/MSD performed on sample GPT-03-16GW-001 had a percent recovery greater than the quality control limit for Aroclor-1260 in the MS. No action was taken on this basis because the MSD had an acceptable recovery and Aroclor-1260 was not detected in the spiked sample.

The continuing calibration average percent difference exceeded the 15% quality control limit on 07/13/07 @ 19:39 on the primary and secondary column for Aroclor-1260. The non-detected Aroclor-1260 results have been qualified as estimated (UJ) in the associated samples.

Continuing calibration average percent differences exceeded the 15% quality control limit on 07/14/07 @ 00:54 on the primary and secondary column for Aroclor-1016 and Aroclor-1260. The non-detected Aroclor-1016 and Aroclor-1260 results have been qualified as estimated (UJ) in the associated samples.

Continuing calibration average percent differences exceeded the 15% quality control limit on 07/14/07 @ 03:23 on the primary and secondary column for Aroclor-1016 and Aroclor-1260. The non-detected Aroclor-1016 and Aroclor-1260 results have been qualified as estimated (UJ) in the associated samples.

Herbicides

The LCS associated with batch HW1BLK0706 had percent recoveries less than the quality control limit for dalapon, dichloroprop, and MCPA. The nondetected results for the aforementioned compounds have been qualified as estimated (UJ) in the associated samples.

The MS/MSD performed on sample GPT-03-16GW-001 had a percent recovery greater than the quality control limit for MCPA in the MS. In addition, the RPD for MCPA and MCPA were outside the quality control limit. No action was taken on this basis because the aforementioned compounds were not detected in the unspiked sample.

The laboratory stated that they could not get a valid calibration on the confirmation column. The positive dicamba results could not be confirmed in samples GPT-03-11GW-001, GPT-03-15GW-001, and GPT-03-17GW-001. The laboratory reported the dicamba results as nondetected and raised the reporting limit for dicamba to 0.2 ug/L for the aforementioned samples. No action was taken on this basis but is noted for data completeness.

Continuing calibration %Ds exceeded the 15% quality control limit on 08/01/07 @ 13:43 for 2,4-D and 2,4,5-T. No qualifiers were assigned on this basis because the average percent difference for all calibration compounds was less than 15%.

Additional Comments:

Positive results reported below the quantitation limit but above the method detection limit were qualified as estimated, J.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Several semivolatile, pesticides, PCB, and herbicide compounds exceeded the continuing calibration %D criteria. The semivolatile and herbicide fractions had LCS non-compliances.

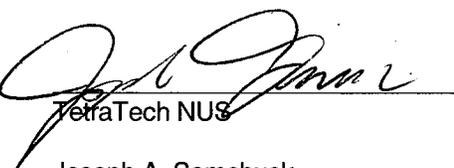
Other Factors Affecting Data Quality: The semivolatile, PCB, and herbicide fractions had MS/MSD non-compliances.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999), and Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DoD QSM."


Tetra Tech NUS

Edward Sedlmyer
Chemist/Data Validator


TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

- Appendix A – Qualified Analytical Results
- Appendix B – Results as Reported by the Laboratory
- Appendix C – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: OS

nsample GPT-03-08GW-001
 samp_date 7/1/2007
 lab_id 0707014-01
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-08GW-001
 samp_date 7/1/2007
 lab_id 0707014-01
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-08GW-001
 samp_date 7/1/2007
 lab_id 0707014-01
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
1,1-BIPHENYL	4.9	U	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	4.9	U	U	
2,4,5-TRICHLOROPHENOL	4.9	U	U	
2,4,6-TRICHLOROPHENOL	4.9	U	U	
2,4-DICHLOROPHENOL	4.9	U	U	
2,4-DIMETHYLPHENOL	20	U	U	
2,4-DINITROPHENOL	49	U	U	
2,4-DINITROTOLUENE	4.9	U	U	
2,6-DINITROTOLUENE	4.9	U	U	
2-CHLORONAPHTHALENE	4.9	U	U	
2-CHLOROPHENOL	4.9	U	U	
2-METHYLNAPHTHALENE	4.9	U	U	
2-METHYLPHENOL	4.9	U	U	
2-NITROANILINE	20	U	U	
2-NITROPHENOL	4.9	U	U	
3,3'-DICHLOROBENZIDINE	4.9	U	UJ	C
3-NITROANILINE	20	U	U	
4,6-DINITRO-2-METHYLPHENOL	20	U	U	
4-BROMOPHENYL PHENYL ETHER	4.9	U	U	
4-CHLORO-3-METHYLPHENOL	4.9	U	U	
4-CHLOROANILINE	4.9	U	U	
4-CHLOROPHENYL PHENYL ETHER	4.9	U	U	
4-METHYLPHENOL	4.9	U	U	
4-NITROANILINE	20	U	U	
4-NITROPHENOL	20	U	U	
ACENAPHTHENE	4.9	U	U	
ACENAPHTHYLENE	4.9	U	U	
ACETOPHENONE	4.9	U	U	
ANTHRACENE	4.9	U	U	
ATRAZINE	4.9	U	UJ	C
BENZALDEHYDE	4.9	U	UJ	C
BENZO(A)ANTHRACENE	4.9	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
BENZO(A)PYRENE	4.9	U	U	
BENZO(B)FLUORANTHENE	4.9	U	U	
BENZO(G,H,I)PERYLENE	4.9	U	U	
BENZO(K)FLUORANTHENE	4.9	U	U	
BIS(2-CHLOROETHOXY)METHANE	4.9	U	U	
BIS(2-CHLOROETHYL)ETHER	4.9	U	U	
BIS(2-ETHYLHEXYL)PHTHALATE	4.9	U	U	
BUTYL BENZYL PHTHALATE	4.9	U	U	
CAPROLACTAM	4.9	U	U	
CARBAZOLE	4.9	U	U	
CHRYSENE	4.9	U	U	
DIBENZO(A,H)ANTHRACENE	4.9	U	U	
DIBENZOFURAN	4.9	U	U	
DIETHYL PHTHALATE	4.9	U	U	
DIMETHYL PHTHALATE	4.9	U	U	
DI-N-BUTYL PHTHALATE	4.9	U	U	
DI-N-OCTYL PHTHALATE	4.9	U	U	
FLUORANTHENE	4.9	U	U	
FLUORENE	4.9	U	U	
HEXACHLOROBENZENE	4.9	U	U	
HEXACHLOROBUTADIENE	4.9	U	U	
HEXACHLOROCYCLOPENTADIENE	4.9	U	U	
HEXACHLOROETHANE	4.9	U	U	
INDENO(1,2,3-CD)PYRENE	4.9	U	U	
ISOPHORONE	4.9	U	U	
NAPHTHALENE	4.9	U	U	
NITROBENZENE	4.9	U	U	
N-NITROSO-DI-N-PROPYLAMINE	4.9	U	U	
N-NITROSODIPHENYLAMINE	4.9	U	U	
PENTACHLOROPHENOL	20	U	U	
PHENANTHRENE	4.9	U	U	
PHENOL	4.9	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
PYRENE	4.9	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: OS

nsample GPT-03-09GW-001
 samp_date 7/1/2007
 lab_id 0707014-02
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-09GW-001
 samp_date 7/1/2007
 lab_id 0707014-02
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-09GW-001
 samp_date 7/1/2007
 lab_id 0707014-02
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
1,1-BIPHENYL	4.9	U	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	4.9	U	U	
2,4,5-TRICHLOROPHENOL	4.9	U	U	
2,4,6-TRICHLOROPHENOL	4.9	U	U	
2,4-DICHLOROPHENOL	4.9	U	U	
2,4-DIMETHYLPHENOL	20	U	U	
2,4-DINITROPHENOL	49	U	U	
2,4-DINITROTOLUENE	4.9	U	U	
2,6-DINITROTOLUENE	4.9	U	U	
2-CHLORONAPHTHALENE	4.9	U	U	
2-CHLOROPHENOL	4.9	U	U	
2-METHYLNAPHTHALENE	4.9	U	U	
2-METHYLPHENOL	4.9	U	U	
2-NITROANILINE	20	U	U	
2-NITROPHENOL	4.9	U	U	
3,3'-DICHLOROBENZIDINE	4.9	U	UJ	C
3-NITROANILINE	20	U	U	
4,6-DINITRO-2-METHYLPHENOL	20	U	U	
4-BROMOPHENYL PHENYL ETHER	4.9	U	U	
4-CHLORO-3-METHYLPHENOL	4.9	U	U	
4-CHLOROANILINE	4.9	U	U	
4-CHLOROPHENYL PHENYL ETHER	4.9	U	U	
4-METHYLPHENOL	4.9	U	U	
4-NITROANILINE	20	U	U	
4-NITROPHENOL	20	U	U	
ACENAPHTHENE	4.9	U	U	
ACENAPHTHYLENE	4.9	U	U	
ACETOPHENONE	4.9	U	U	
ANTHRACENE	4.9	U	U	
ATRAZINE	4.9	U	UJ	C
BENZALDEHYDE	4.9	U	UJ	C
BENZO(A)ANTHRACENE	4.9	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
BENZO(A)PYRENE	4.9	U	U	
BENZO(B)FLUORANTHENE	4.9	U	U	
BENZO(G,H,I)PERYLENE	4.9	U	U	
BENZO(K)FLUORANTHENE	4.9	U	U	
BIS(2-CHLOROETHOXY)METHANE	4.9	U	U	
BIS(2-CHLOROETHYL)ETHER	4.9	U	U	
BIS(2-ETHYLHEXYL)PHTHALATE	4.9	U	U	
BUTYL BENZYL PHTHALATE	4.9	U	U	
CAPROLACTAM	4.9	U	U	
CARBAZOLE	4.9	U	U	
CHRYSENE	4.9	U	U	
DIBENZO(A,H)ANTHRACENE	4.9	U	U	
DIBENZOFURAN	4.9	U	U	
DIETHYL PHTHALATE	4.9	U	U	
DIMETHYL PHTHALATE	4.9	U	U	
DI-N-BUTYL PHTHALATE	4.9	U	U	
DI-N-OCTYL PHTHALATE	4.9	U	U	
FLUORANTHENE	4.9	U	U	
FLUORENE	4.9	U	U	
HEXACHLOROBENZENE	4.9	U	U	
HEXACHLOROBUTADIENE	4.9	U	U	
HEXACHLOROCYCLOPENTADIENE	4.9	U	U	
HEXACHLOROETHANE	4.9	U	U	
INDENO(1,2,3-CD)PYRENE	4.9	U	U	
ISOPHORONE	4.9	U	U	
NAPHTHALENE	4.9	U	U	
NITROBENZENE	4.9	U	U	
N-NITROSO-DI-N-PROPYLAMINE	4.9	U	U	
N-NITROSODIPHENYLAMINE	4.9	U	U	
PENTACHLOROPHENOL	20	U	U	
PHENANTHRENE	4.9	U	U	
PHENOL	4.9	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
PYRENE	4.9	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: OS

nsample GPT-03-10GW-001
 samp_date 7/1/2007
 lab_id 0707014-03
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-10GW-001
 samp_date 7/1/2007
 lab_id 0707014-03
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-10GW-001
 samp_date 7/1/2007
 lab_id 0707014-03
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
1,1-BIPHENYL	4.8	U	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	4.8	U	U	
2,4,5-TRICHLOROPHENOL	4.8	U	U	
2,4,6-TRICHLOROPHENOL	4.8	U	U	
2,4-DICHLOROPHENOL	4.8	U	U	
2,4-DIMETHYLPHENOL	19	U	U	
2,4-DINITROPHENOL	48	U	U	
2,4-DINITROTOLUENE	0.63	J	J	P
2,6-DINITROTOLUENE	4.8	U	U	
2-CHLORONAPHTHALENE	4.8	U	U	
2-CHLOROPHENOL	4.8	U	U	
2-METHYLNAPHTHALENE	4.8	U	U	
2-METHYLPHENOL	4.8	U	U	
2-NITROANILINE	19	U	U	
2-NITROPHENOL	4.8	U	U	
3,3'-DICHLOROBENZIDINE	4.8	U	UJ	C
3-NITROANILINE	19	U	U	
4,6-DINITRO-2-METHYLPHENOL	19	U	U	
4-BROMOPHENYL PHENYL ETHER	4.8	U	U	
4-CHLORO-3-METHYLPHENOL	4.8	U	U	
4-CHLOROANILINE	4.8	U	U	
4-CHLOROPHENYL PHENYL ETHER	4.8	U	U	
4-METHYLPHENOL	4.8	U	U	
4-NITROANILINE	19	U	U	
4-NITROPHENOL	19	U	U	
ACENAPHTHENE	4.8	U	U	
ACENAPHTHYLENE	4.8	U	U	
ACETOPHENONE	4.8	U	U	
ANTHRACENE	4.8	U	U	
ATRAZINE	4.8	U	UJ	C
BENZALDEHYDE	4.8	U	UJ	C
BENZO(A)ANTHRACENE	4.8	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
BENZO(A)PYRENE	4.8	U	U	
BENZO(B)FLUORANTHENE	4.8	U	U	
BENZO(G,H,I)PERYLENE	4.8	U	U	
BENZO(K)FLUORANTHENE	4.8	U	U	
BIS(2-CHLOROETHOXY)METHANE	4.8	U	U	
BIS(2-CHLOROETHYL)ETHER	4.8	U	U	
BIS(2-ETHYLHEXYL)PHTHALATE	4.8	U	U	
BUTYL BENZYL PHTHALATE	4.8	U	U	
CAPROLACTAM	4.8	U	U	
CARBAZOLE	4.8	U	U	
CHRYSENE	4.8	U	U	
DIBENZO(A,H)ANTHRACENE	4.8	U	U	
DIBENZOFURAN	4.8	U	U	
DIETHYL PHTHALATE	4.8	U	U	
DIMETHYL PHTHALATE	4.8	U	U	
DI-N-BUTYL PHTHALATE	4.8	U	U	
DI-N-OCTYL PHTHALATE	4.8	U	U	
FLUORANTHENE	4.8	U	U	
FLUORENE	4.8	U	U	
HEXACHLOROENZENE	4.8	U	U	
HEXACHLOROBUTADIENE	4.8	U	U	
HEXACHLOROCYCLOPENTADIENE	4.8	U	U	
HEXACHLOROETHANE	4.8	U	U	
INDENO(1,2,3-CD)PYRENE	4.8	U	U	
ISOPHORONE	4.8	U	U	
NAPHTHALENE	4.8	U	U	
NITROBENZENE	4.8	U	U	
N-NITROSO-DI-N-PROPYLAMINE	4.8	U	U	
N-NITROSODIPHENYLAMINE	4.8	U	U	
PENTACHLOROPHENOL	19	U	U	
PHENANTHRENE	4.8	U	U	
PHENOL	4.8	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
PYRENE	4.8	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: OS

nsample GPT-03-11GW-001
 samp_date 7/1/2007
 lab_id 0707014-04
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-11GW-001
 samp_date 7/1/2007
 lab_id 0707014-04
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-11GW-001
 samp_date 7/1/2007
 lab_id 0707014-04
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
1,1-BIPHENYL	4.9	U	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	4.9	U	U	
2,4,5-TRICHLOROPHENOL	4.9	U	U	
2,4,6-TRICHLOROPHENOL	4.9	U	U	
2,4-DICHLOROPHENOL	4.9	U	U	
2,4-DIMETHYLPHENOL	20	U	U	
2,4-DINITROPHENOL	49	U	U	
2,4-DINITROTOLUENE	4.9	U	U	
2,6-DINITROTOLUENE	4.9	U	U	
2-CHLORONAPHTHALENE	4.9	U	U	
2-CHLOROPHENOL	4.9	U	U	
2-METHYLNAPHTHALENE	4.9	U	U	
2-METHYLPHENOL	4.9	U	U	
2-NITROANILINE	20	U	U	
2-NITROPHENOL	4.9	U	U	
3,3'-DICHLOROBENZIDINE	4.9	U	UJ	C
3-NITROANILINE	20	U	U	
4,6-DINITRO-2-METHYLPHENOL	20	U	U	
4-BROMOPHENYL PHENYL ETHER	4.9	U	U	
4-CHLORO-3-METHYLPHENOL	4.9	U	U	
4-CHLOROANILINE	4.9	U	U	
4-CHLOROPHENYL PHENYL ETHER	4.9	U	U	
4-METHYLPHENOL	4.9	U	U	
4-NITROANILINE	20	U	U	
4-NITROPHENOL	20	U	U	
ACENAPHTHENE	4.9	U	U	
ACENAPHTHYLENE	4.9	U	U	
ACETOPHENONE	4.9	U	U	
ANTHRACENE	4.9	U	U	
ATRAZINE	4.9	U	UJ	C
BENZALDEHYDE	4.9	U	UJ	C
BENZO(A)ANTHRACENE	4.9	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
BENZO(A)PYRENE	4.9	U	U	
BENZO(B)FLUORANTHENE	4.9	U	U	
BENZO(G,H,I)PERYLENE	4.9	U	U	
BENZO(K)FLUORANTHENE	4.9	U	U	
BIS(2-CHLOROETHOXY)METHANE	4.9	U	U	
BIS(2-CHLOROETHYL)ETHER	4.9	U	U	
BIS(2-ETHYLHEXYL)PHTHALATE	4.9	U	U	
BUTYL BENZYL PHTHALATE	4.9	U	U	
CAPROLACTAM	4.9	U	U	
CARBAZOLE	4.9	U	U	
CHRYSENE	4.9	U	U	
DIBENZO(A,H)ANTHRACENE	4.9	U	U	
DIBENZOFURAN	4.9	U	U	
DIETHYL PHTHALATE	4.9	U	U	
DIMETHYL PHTHALATE	4.9	U	U	
DI-N-BUTYL PHTHALATE	4.9	U	U	
DI-N-OCTYL PHTHALATE	4.9	U	U	
FLUORANTHENE	4.9	U	U	
FLUORENE	4.9	U	U	
HEXACHLOROENZENE	4.9	U	U	
HEXACHLOROBUTADIENE	4.9	U	U	
HEXACHLOROCYCLOPENTADIENE	4.9	U	U	
HEXACHLOROETHANE	4.9	U	U	
INDENO(1,2,3-CD)PYRENE	4.9	U	U	
ISOPHORONE	4.9	U	U	
NAPHTHALENE	4.9	U	U	
NITROBENZENE	4.9	U	U	
N-NITROSO-DI-N-PROPYLAMINE	4.9	U	U	
N-NITROSODIPHENYLAMINE	4.9	U	U	
PENTACHLOROPHENOL	20	U	U	
PHENANTHRENE	4.9	U	U	
PHENOL	4.9	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
PYRENE	4.9	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: OS

nsample GPT-03-12GW-001
 samp_date 7/1/2007
 lab_id 0707014-05
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-12GW-001
 samp_date 7/1/2007
 lab_id 0707014-05
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-12GW-001
 samp_date 7/1/2007
 lab_id 0707014-05
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
1,1-BIPHENYL	4.6	U	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	4.6	U	U	
2,4,5-TRICHLOROPHENOL	4.6	U	U	
2,4,6-TRICHLOROPHENOL	4.6	U	U	
2,4-DICHLOROPHENOL	4.6	U	U	
2,4-DIMETHYLPHENOL	18	U	U	
2,4-DINITROPHENOL	46	U	U	
2,4-DINITROTOLUENE	4.6	U	U	
2,6-DINITROTOLUENE	4.6	U	U	
2-CHLORONAPHTHALENE	4.6	U	U	
2-CHLOROPHENOL	4.6	U	U	
2-METHYLNAPHTHALENE	4.6	U	U	
2-METHYLPHENOL	4.6	U	U	
2-NITROANILINE	18	U	U	
2-NITROPHENOL	4.6	U	U	
3,3'-DICHLOROBENZIDINE	4.6	U	UJ	C
3-NITROANILINE	18	U	U	
4,6-DINITRO-2-METHYLPHENOL	18	U	U	
4-BROMOPHENYL PHENYL ETHER	4.6	U	U	
4-CHLORO-3-METHYLPHENOL	4.6	U	U	
4-CHLOROANILINE	4.6	U	U	
4-CHLOROPHENYL PHENYL ETHER	4.6	U	U	
4-METHYLPHENOL	4.6	U	U	
4-NITROANILINE	18	U	U	
4-NITROPHENOL	18	U	U	
ACENAPHTHENE	4.6	U	U	
ACENAPHTHYLENE	4.6	U	U	
ACETOPHENONE	4.6	U	U	
ANTHRACENE	4.6	U	U	
ATRAZINE	4.6	U	UJ	C
BENZALDEHYDE	4.6	U	UJ	C
BENZO(A)ANTHRACENE	4.6	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
BENZO(A)PYRENE	4.6	U	U	
BENZO(B)FLUORANTHENE	4.6	U	U	
BENZO(G,H,I)PERYLENE	4.6	U	U	
BENZO(K)FLUORANTHENE	4.6	U	U	
BIS(2-CHLOROETHOXY)METHANE	4.6	U	U	
BIS(2-CHLOROETHYL)ETHER	4.6	U	U	
BIS(2-ETHYLHEXYL)PHTHALATE	4.6	U	U	
BUTYL BENZYL PHTHALATE	4.6	U	U	
CAPROLACTAM	4.6	U	U	
CARBAZOLE	4.6	U	U	
CHRYSENE	4.6	U	U	
DIBENZO(A,H)ANTHRACENE	4.6	U	U	
DIBENZOFURAN	4.6	U	U	
DIETHYL PHTHALATE	4.6	U	U	
DIMETHYL PHTHALATE	4.6	U	U	
DI-N-BUTYL PHTHALATE	4.6	U	U	
DI-N-OCTYL PHTHALATE	4.6	U	U	
FLUORANTHENE	4.6	U	U	
FLUORENE	4.6	U	U	
HEXACHLOROBENZENE	4.6	U	U	
HEXACHLOROBUTADIENE	4.6	U	U	
HEXACHLOROCYCLOPENTADIENE	4.6	U	U	
HEXACHLOROETHANE	4.6	U	U	
INDENO(1,2,3-CD)PYRENE	4.6	U	U	
ISOPHORONE	4.6	U	U	
NAPHTHALENE	4.6	U	U	
NITROBENZENE	4.6	U	U	
N-NITROSO-DI-N-PROPYLAMINE	4.6	U	U	
N-NITROSODIPHENYLAMINE	4.6	U	U	
PENTACHLOROPHENOL	18	U	U	
PHENANTHRENE	4.6	U	U	
PHENOL	4.6	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
PYRENE	4.6	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: OS

nsample GPT-03-13GW-001
 samp_date 7/1/2007
 lab_id 0707014-06
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-13GW-001
 samp_date 7/1/2007
 lab_id 0707014-06
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-13GW-001
 samp_date 7/1/2007
 lab_id 0707014-06
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
1,1-BIPHENYL	4.6	U	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	4.6	U	U	
2,4,5-TRICHLOROPHENOL	4.6	U	U	
2,4,6-TRICHLOROPHENOL	4.6	U	U	
2,4-DICHLOROPHENOL	4.6	U	U	
2,4-DIMETHYLPHENOL	18	U	U	
2,4-DINITROPHENOL	46	U	U	
2,4-DINITROTOLUENE	4.6	U	U	
2,6-DINITROTOLUENE	4.6	U	U	
2-CHLORONAPHTHALENE	4.6	U	U	
2-CHLOROPHENOL	4.6	U	U	
2-METHYLNAPHTHALENE	4.6	U	U	
2-METHYLPHENOL	4.6	U	U	
2-NITROANILINE	18	U	U	
2-NITROPHENOL	4.6	U	U	
3,3'-DICHLOROBENZIDINE	4.6	U	UJ	C
3-NITROANILINE	18	U	U	
4,6-DINITRO-2-METHYLPHENOL	18	U	U	
4-BROMOPHENYL PHENYL ETHER	4.6	U	U	
4-CHLORO-3-METHYLPHENOL	4.6	U	U	
4-CHLOROANILINE	4.6	U	U	
4-CHLOROPHENYL PHENYL ETHER	4.6	U	U	
4-METHYLPHENOL	4.6	U	U	
4-NITROANILINE	18	U	U	
4-NITROPHENOL	18	U	U	
ACENAPHTHENE	4.6	U	U	
ACENAPHTHYLENE	4.6	U	U	
ACETOPHENONE	4.6	U	U	
ANTHRACENE	4.6	U	U	
ATRAZINE	4.6	U	UJ	C
BENZALDEHYDE	4.6	U	UJ	C
BENZO(A)ANTHRACENE	4.6	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
BENZO(A)PYRENE	4.6	U	U	
BENZO(B)FLUORANTHENE	4.6	U	U	
BENZO(G,H,I)PERYLENE	4.6	U	U	
BENZO(K)FLUORANTHENE	4.6	U	U	
BIS(2-CHLOROETHOXY)METHANE	4.6	U	U	
BIS(2-CHLOROETHYL)ETHER	4.6	U	U	
BIS(2-ETHYLHEXYL)PHTHALATE	4.6	U	U	
BUTYL BENZYL PHTHALATE	4.6	U	U	
CAPROLACTAM	4.6	U	U	
CARBAZOLE	4.6	U	U	
CHRYSENE	4.6	U	U	
DIBENZO(A,H)ANTHRACENE	4.6	U	U	
DIBENZOFURAN	4.6	U	U	
DIETHYL PHTHALATE	4.6	U	U	
DIMETHYL PHTHALATE	4.6	U	U	
DI-N-BUTYL PHTHALATE	4.6	U	U	
DI-N-OCTYL PHTHALATE	4.6	U	U	
FLUORANTHENE	4.6	U	U	
FLUORENE	4.6	U	U	
HEXACHLOROBENZENE	4.6	U	U	
HEXACHLOROBUTADIENE	4.6	U	U	
HEXACHLOROCYCLOPENTADIENE	4.6	U	U	
HEXACHLOROETHANE	4.6	U	U	
INDENO(1,2,3-CD)PYRENE	4.6	U	U	
ISOPHORONE	4.6	U	U	
NAPHTHALENE	4.6	U	U	
NITROBENZENE	4.6	U	U	
N-NITROSO-DI-N-PROPYLAMINE	4.6	U	U	
N-NITROSODIPHENYLAMINE	4.6	U	U	
PENTACHLOROPHENOL	18	U	U	
PHENANTHRENE	4.6	U	U	
PHENOL	4.6	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
PYRENE	4.6	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: OS

nsample GPT-03-13GW-001D
 samp_date 7/1/2007
 lab_id 0707014-07
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF: GPT-03-13GW-001

nsample GPT-03-13GW-001D
 samp_date 7/1/2007
 lab_id 0707014-07
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF: GPT-03-13GW-001

nsample GPT-03-13GW-001D
 samp_date 7/1/2007
 lab_id 0707014-07
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF: GPT-03-13GW-001

Parameter	Result	Lab Qual	Val Qual	Qual Code
1,1-BIPHENYL	4.6	U	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	4.6	U	U	
2,4,5-TRICHLOROPHENOL	4.6	U	U	
2,4,6-TRICHLOROPHENOL	4.6	U	U	
2,4-DICHLOROPHENOL	4.6	U	U	
2,4-DIMETHYLPHENOL	18	U	U	
2,4-DINITROPHENOL	4.6	U	U	
2,4-DINITROTOLUENE	4.6	U	U	
2,6-DINITROTOLUENE	4.6	U	U	
2-CHLORONAPHTHALENE	4.6	U	U	
2-CHLOROPHENOL	4.6	U	U	
2-METHYLNAPHTHALENE	4.6	U	U	
2-METHYLPHENOL	4.6	U	U	
2-NITROANILINE	18	U	U	
2-NITROPHENOL	4.6	U	U	
3,3'-DICHLOROBENZIDINE	4.6	U	UU	C
3-NITROANILINE	18	U	U	
4,6-DINITRO-2-METHYLPHENOL	18	U	U	
4-BROMOPHENYL PHENYL ETHER	4.6	U	U	
4-CHLORO-3-METHYLPHENOL	4.6	U	U	
4-CHLOROANILINE	4.6	U	U	
4-CHLOROPHENYL PHENYL ETHER	4.6	U	U	
4-METHYLPHENOL	4.6	U	U	
4-NITROANILINE	18	U	U	
4-NITROPHENOL	18	U	U	
ACENAPHTHENE	4.6	U	U	
ACENAPHTHYLENE	4.6	U	U	
ACETOPHENONE	4.6	U	U	
ANTHRACENE	4.6	U	U	
ATRAZINE	4.6	U	UU	C
BENZALDEHYDE	4.6	U	UU	C
BENZO(A)ANTHRACENE	4.6	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
BENZO(A)PYRENE	4.6	U	U	
BENZO(B)FLUORANTHENE	4.6	U	U	
BENZO(G,H,I)PERYLENE	4.6	U	U	
BENZO(K)FLUORANTHENE	4.6	U	U	
BIS(2-CHLOROETHOXY)METHANE	4.6	U	U	
BIS(2-CHLOROETHYL)ETHER	4.6	U	U	
BIS(2-ETHYLHEXYL)PHTHALATE	4.6	U	U	
BUTYL BENZYL PHTHALATE	4.6	U	U	
CAPROLACTAM	4.6	U	U	
CARBAZOLE	4.6	U	U	
CHRYSENE	4.6	U	U	
DIBENZO(A,H)ANTHRACENE	4.6	U	U	
DIBENZOFURAN	4.6	U	U	
DIETHYL PHTHALATE	4.6	U	U	
DIMETHYL PHTHALATE	4.6	U	U	
DI-N-BUTYL PHTHALATE	4.6	U	U	
DI-N-OCTYL PHTHALATE	4.6	U	U	
FLUORANTHENE	4.6	U	U	
FLUORENE	4.6	U	U	
HEXACHLOROBENZENE	4.6	U	U	
HEXACHLOROBUTADIENE	4.6	U	U	
HEXACHLOROCYCLOPENTADIENE	4.6	U	U	
HEXACHLOROETHANE	4.6	U	U	
INDENO(1,2,3-CD)PYRENE	4.6	U	U	
ISOPHORONE	4.6	U	U	
NAPHTHALENE	4.6	U	U	
NITROBENZENE	4.6	U	U	
N-NITROSO-DI-N-PROPYLAMINE	4.6	U	U	
N-NITROSODIPHENYLAMINE	4.6	U	U	
PENTACHLOROPHENOL	18	U	U	
PHENANTHRENE	4.6	U	U	
PHENOL	4.6	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
PYRENE	4.6	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: OS

nsample GPT-03-14GW-001
 samp_date 7/1/2007
 lab_id 0707014-08
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-14GW-001
 samp_date 7/1/2007
 lab_id 0707014-08
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-14GW-001
 samp_date 7/1/2007
 lab_id 0707014-08
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
1,1-BIPHENYL	4.7	U	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	4.7	U	U	
2,4,5-TRICHLOROPHENOL	4.7	U	U	
2,4,6-TRICHLOROPHENOL	4.7	U	U	
2,4-DICHLOROPHENOL	4.7	U	U	
2,4-DIMETHYLPHENOL	19	U	U	
2,4-DINITROPHENOL	47	U	U	
2,4-DINITROTOLUENE	4.7	U	U	
2,6-DINITROTOLUENE	4.7	U	U	
2-CHLORONAPHTHALENE	4.7	U	U	
2-CHLOROPHENOL	4.7	U	U	
2-METHYLNAPHTHALENE	4.7	U	U	
2-METHYLPHENOL	4.7	U	U	
2-NITROANILINE	19	U	U	
2-NITROPHENOL	4.7	U	U	
3,3'-DICHLOROBENZIDINE	4.7	U	UJ	C
3-NITROANILINE	19	U	U	
4,6-DINITRO-2-METHYLPHENOL	19	U	U	
4-BROMOPHENYL PHENYL ETHER	4.7	U	U	
4-CHLORO-3-METHYLPHENOL	4.7	U	U	
4-CHLOROANILINE	4.7	U	U	
4-CHLOROPHENYL PHENYL ETHER	4.7	U	U	
4-METHYLPHENOL	4.7	U	U	
4-NITROANILINE	19	U	U	
4-NITROPHENOL	19	U	U	
ACENAPHTHENE	4.7	U	U	
ACENAPHTHYLENE	4.7	U	U	
ACETOPHENONE	4.7	U	U	
ANTHRACENE	4.7	U	U	
ATRAZINE	4.7	U	UJ	C
BENZALDEHYDE	4.7	U	UJ	C
BENZO(A)ANTHRACENE	4.7	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
BENZO(A)PYRENE	4.7	U	U	
BENZO(B)FLUORANTHENE	4.7	U	U	
BENZO(G,H,I)PERYLENE	4.7	U	U	
BENZO(K)FLUORANTHENE	4.7	U	U	
BIS(2-CHLOROETHOXY)METHANE	4.7	U	U	
BIS(2-CHLOROETHYL)ETHER	4.7	U	U	
BIS(2-ETHYLHEXYL)PHTHALATE	4.7	U	U	
BUTYL BENZYL PHTHALATE	4.7	U	U	
CAPROLACTAM	4.7	U	U	
CARBAZOLE	4.7	U	U	
CHRYSENE	4.7	U	U	
DIBENZO(A,H)ANTHRACENE	4.7	U	U	
DIBENZOFURAN	4.7	U	U	
DIETHYL PHTHALATE	4.7	U	U	
DIMETHYL PHTHALATE	4.7	U	U	
DI-N-BUTYL PHTHALATE	4.7	U	U	
DI-N-OCTYL PHTHALATE	4.7	U	U	
FLUORANTHENE	4.7	U	U	
FLUORENE	4.7	U	U	
HEXACHLOROBENZENE	4.7	U	U	
HEXACHLOROBUTADIENE	4.7	U	U	
HEXACHLOROCYCLOPENTADIENE	4.7	U	U	
HEXACHLOROETHANE	4.7	U	U	
INDENO(1,2,3-CD)PYRENE	4.7	U	U	
ISOPHORONE	4.7	U	U	
NAPHTHALENE	4.7	U	U	
NITROBENZENE	4.7	U	U	
N-NITROSO-DI-N-PROPYLAMINE	4.7	U	U	
N-NITROSODIPHENYLAMINE	4.7	U	U	
PENTACHLOROPHENOL	19	U	U	
PHENANTHRENE	4.7	U	U	
PHENOL	4.7	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
PYRENE	4.7	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: OS

nsample GPT-03-15GW-001
 samp_date 7/2/2007
 lab_id 0707014-09
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-15GW-001
 samp_date 7/2/2007
 lab_id 0707014-09
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-15GW-001
 samp_date 7/2/2007
 lab_id 0707014-09
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
1,1-BIPHENYL	4.8	U	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	4.8	U	U	
2,4,5-TRICHLOROPHENOL	4.8	U	U	
2,4,6-TRICHLOROPHENOL	4.8	U	U	
2,4-DICHLOROPHENOL	4.8	U	U	
2,4-DIMETHYLPHENOL	19	U	U	
2,4-DINITROPHENOL	48	U	U	
2,4-DINITROTOLUENE	4.8	U	U	
2,6-DINITROTOLUENE	4.8	U	U	
2-CHLORONAPHTHALENE	4.8	U	U	
2-CHLOROPHENOL	4.8	U	U	
2-METHYLNAPHTHALENE	4.8	U	U	
2-METHYLPHENOL	4.8	U	U	
2-NITROANILINE	19	U	U	
2-NITROPHENOL	4.8	U	U	
3,3'-DICHLOROBENZIDINE	4.8	U	UJ	C
3-NITROANILINE	19	U	U	
4,6-DINITRO-2-METHYLPHENOL	19	U	U	
4-BROMOPHENYL PHENYL ETHER	4.8	U	U	
4-CHLORO-3-METHYLPHENOL	4.8	U	U	
4-CHLOROANILINE	4.8	U	U	
4-CHLOROPHENYL PHENYL ETHER	4.8	U	U	
4-METHYLPHENOL	4.8	U	U	
4-NITROANILINE	19	U	U	
4-NITROPHENOL	19	U	U	
ACENAPHTHENE	4.8	U	U	
ACENAPHTHYLENE	4.8	U	U	
ACETOPHENONE	4.8	U	U	
ANTHRACENE	4.8	U	U	
ATRAZINE	4.8	U	UJ	C
BENZALDEHYDE	4.8	U	UJ	C
BENZO(A)ANTHRACENE	4.8	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
BENZO(A)PYRENE	4.8	U	U	
BENZO(B)FLUORANTHENE	4.8	U	U	
BENZO(G,H,I)PERYLENE	4.8	U	U	
BENZO(K)FLUORANTHENE	4.8	U	U	
BIS(2-CHLOROETHOXY)METHANE	4.8	U	U	
BIS(2-CHLOROETHYL)ETHER	4.8	U	U	
BIS(2-ETHYLHEXYL)PHTHALATE	4.8	U	U	
BUTYL BENZYL PHTHALATE	4.8	U	U	
CAPROLACTAM	4.8	U	U	
CARBAZOLE	4.8	U	U	
CHRYSENE	4.8	U	U	
DIBENZO(A,H)ANTHRACENE	4.8	U	U	
DIBENZOFURAN	4.8	U	U	
DIETHYL PHTHALATE	4.8	U	U	
DIMETHYL PHTHALATE	4.8	U	U	
DI-N-BUTYL PHTHALATE	4.8	U	U	
DI-N-OCTYL PHTHALATE	4.8	U	U	
FLUORANTHENE	4.8	U	U	
FLUORENE	4.8	U	U	
HEXACHLOROBENZENE	4.8	U	U	
HEXACHLOROBUTADIENE	4.8	U	U	
HEXACHLOROCYCLOPENTADIENE	4.8	U	U	
HEXACHLOROETHANE	4.8	U	U	
INDENO(1,2,3-CD)PYRENE	4.8	U	U	
ISOPHORONE	4.8	U	U	
NAPHTHALENE	4.8	U	U	
NITROBENZENE	4.8	U	U	
N-NITROSO-DI-N-PROPYLAMINE	4.8	U	U	
N-NITROSODIPHENYLAMINE	4.8	U	U	
PENTACHLOROPHENOL	19	U	U	
PHENANTHRENE	4.8	U	U	
PHENOL	4.8	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
PYRENE	4.8	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: OS

nsample GPT-03-16GW-001
 samp_date 7/2/2007
 lab_id 0707014-10
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-16GW-001
 samp_date 7/2/2007
 lab_id 0707014-10
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-16GW-001
 samp_date 7/2/2007
 lab_id 0707014-10
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
1,1-BIPHENYL	4.7	U	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	4.7	U	U	
2,4,5-TRICHLOROPHENOL	4.7	U	U	
2,4,6-TRICHLOROPHENOL	4.7	U	U	
2,4-DICHLOROPHENOL	4.7	U	U	
2,4-DIMETHYLPHENOL	19	U	U	
2,4-DINITROPHENOL	47	U	U	
2,4-DINITROTOLUENE	4.7	U	U	
2,6-DINITROTOLUENE	4.7	U	U	
2-CHLORONAPHTHALENE	4.7	U	U	
2-CHLOROPHENOL	4.7	U	U	
2-METHYLNAPHTHALENE	4.7	U	U	
2-METHYLPHENOL	4.7	U	U	
2-NITROANILINE	19	U	U	
2-NITROPHENOL	4.7	U	U	
3,3'-DICHLOROBENZIDINE	4.7	U	UJ	C
3-NITROANILINE	19	U	U	
4,6-DINITRO-2-METHYLPHENOL	19	U	U	
4-BROMOPHENYL PHENYL ETHER	4.7	U	U	
4-CHLORO-3-METHYLPHENOL	4.7	U	U	
4-CHLOROANILINE	4.7	U	U	
4-CHLOROPHENYL PHENYL ETHER	4.7	U	U	
4-METHYLPHENOL	4.7	U	U	
4-NITROANILINE	19	U	U	
4-NITROPHENOL	19	U	U	
ACENAPHTHENE	4.7	U	U	
ACENAPHTHYLENE	4.7	U	U	
ACETOPHENONE	4.7	U	U	
ANTHRACENE	4.7	U	U	
ATRAZINE	4.7	U	UJ	C
BENZALDEHYDE	4.7	U	UJ	C
BENZO(A)ANTHRACENE	4.7	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
BENZO(A)PYRENE	4.7	U	U	
BENZO(B)FLUORANTHENE	4.7	U	U	
BENZO(G,H,I)PERYLENE	4.7	U	U	
BENZO(K)FLUORANTHENE	4.7	U	U	
BIS(2-CHLOROETHOXY)METHANE	4.7	U	U	
BIS(2-CHLOROETHYL)ETHER	4.7	U	U	
BIS(2-ETHYLHEXYL)PHTHALATE	4.7	U	U	
BUTYL BENZYL PHTHALATE	4.7	U	U	
CAPROLACTAM	4.7	U	U	
CARBAZOLE	4.7	U	U	
CHRYSENE	4.7	U	U	
DIBENZO(A,H)ANTHRACENE	4.7	U	U	
DIBENZOFURAN	4.7	U	U	
DIETHYL PHTHALATE	4.7	U	U	
DIMETHYL PHTHALATE	4.7	U	U	
DI-N-BUTYL PHTHALATE	4.7	U	U	
DI-N-OCTYL PHTHALATE	4.7	U	U	
FLUORANTHENE	4.7	U	U	
FLUORENE	4.7	U	U	
HEXACHLOROENZENE	4.7	U	U	
HEXACHLOROBUTADIENE	4.7	U	U	
HEXACHLOROCYCLOPENTADIENE	4.7	U	U	
HEXACHLOROETHANE	4.7	U	U	
INDENO(1,2,3-CD)PYRENE	4.7	U	U	
ISOPHORONE	4.7	U	U	
NAPHTHALENE	4.7	U	U	
NITROBENZENE	4.7	U	U	
N-NITROSO-DI-N-PROPYLAMINE	4.7	U	U	
N-NITROSODIPHENYLAMINE	4.7	U	U	
PENTACHLOROPHENOL	19	U	U	
PHENANTHRENE	4.7	U	U	
PHENOL	4.7	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
PYRENE	4.7	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: OS

nsample GPT-03-17GW-001
 samp_date 7/2/2007
 lab_id 0707014-11
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-17GW-001
 samp_date 7/2/2007
 lab_id 0707014-11
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-17GW-001
 samp_date 7/2/2007
 lab_id 0707014-11
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
1,1-BIPHENYL	5	U	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	5	U	U	
2,4,5-TRICHLOROPHENOL	5	U	U	
2,4,6-TRICHLOROPHENOL	5	U	U	
2,4-DICHLOROPHENOL	5	U	U	
2,4-DIMETHYLPHENOL	20	U	U	
2,4-DINITROPHENOL	50	U	U	
2,4-DINITROTOLUENE	5	U	U	
2,6-DINITROTOLUENE	5	U	U	
2-CHLORONAPHTHALENE	5	U	U	
2-CHLOROPHENOL	5	U	U	
2-METHYLNAPHTHALENE	5	U	U	
2-METHYLPHENOL	5	U	U	
2-NITROANILINE	20	U	U	
2-NITROPHENOL	5	U	U	
3,3'-DICHLOROBENZIDINE	5	U	UJ	C
3-NITROANILINE	20	U	U	
4,6-DINITRO-2-METHYLPHENOL	20	U	U	
4-BROMOPHENYL PHENYL ETHER	5	U	U	
4-CHLORO-3-METHYLPHENOL	5	U	U	
4-CHLOROANILINE	5	U	U	
4-CHLOROPHENYL PHENYL ETHER	5	U	U	
4-METHYLPHENOL	5	U	U	
4-NITROANILINE	20	U	U	
4-NITROPHENOL	20	U	U	
ACENAPHTHENE	5	U	U	
ACENAPHTHYLENE	5	U	U	
ACETOPHENONE	5	U	U	
ANTHRACENE	5	U	U	
ATRAZINE	5	U	UJ	C
BENZALDEHYDE	5	U	UJ	C
BENZO(A)ANTHRACENE	5	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
BENZO(A)PYRENE	5	U	U	
BENZO(B)FLUORANTHENE	5	U	U	
BENZO(G,H,I)PERYLENE	5	U	U	
BENZO(K)FLUORANTHENE	5	U	U	
BIS(2-CHLOROETHOXY)METHANE	5	U	U	
BIS(2-CHLOROETHYL)ETHER	5	U	U	
BIS(2-ETHYLHEXYL)PHTHALATE	5	U	U	
BUTYL BENZYL PHTHALATE	5	U	U	
CAPROLACTAM	5	U	U	
CARBAZOLE	5	U	U	
CHRYSENE	5	U	U	
DIBENZO(A,H)ANTHRACENE	5	U	U	
DIBENZOFURAN	5	U	U	
DIETHYL PHTHALATE	5	U	U	
DIMETHYL PHTHALATE	5	U	U	
DI-N-BUTYL PHTHALATE	5	U	U	
DI-N-OCTYL PHTHALATE	5	U	U	
FLUORANTHENE	5	U	U	
FLUORENE	5	U	U	
HEXACHLOROBENZENE	5	U	U	
HEXACHLOROBUTADIENE	5	U	U	
HEXACHLOROCYCLOPENTADIENE	5	U	U	
HEXACHLOROETHANE	5	U	U	
INDENO(1,2,3-CD)PYRENE	5	U	U	
ISOPHORONE	5	U	U	
NAPHTHALENE	5	U	U	
NITROBENZENE	5	U	U	
N-NITROSO-DI-N-PROPYLAMINE	5	U	U	
N-NITROSODIPHENYLAMINE	5	U	U	
PENTACHLOROPHENOL	20	U	U	
PHENANTHRENE	5	U	U	
PHENOL	5	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
PYRENE	5	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: PEST/PCB

nsample GPT-03-08GW-001
 samp_date 7/1/2007
 lab_id 0707014-01
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-09GW-001
 samp_date 7/1/2007
 lab_id 0707014-02
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-10GW-001
 samp_date 7/1/2007
 lab_id 0707014-03
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
4,4'-DDD	0.015	U	U	
4,4'-DDE	0.015	U	U	
4,4'-DDT	0.015	U	U	
ALDRIN	0.0075	U	U	
ALPHA-BHC	0.0075	U	U	
ALPHA-CHLORDANE	0.0075	U	U	
AROCLOR-1016	0.38	U	UJ	C
AROCLOR-1221	0.38	U	U	
AROCLOR-1232	0.38	U	U	
AROCLOR-1242	0.38	U	U	
AROCLOR-1248	0.38	U	U	
AROCLOR-1254	0.38	U	U	
AROCLOR-1260	0.38	U	UJ	C
BETA-BHC	0.0075	U	U	
DELTA-BHC	0.0075	U	U	
DIELDRIN	0.015	U	U	
ENDOSULFAN I	0.0075	U	U	
ENDOSULFAN II	0.015	U	U	
ENDOSULFAN SULFATE	0.015	U	U	
ENDRIN	0.015	U	U	
ENDRIN ALDEHYDE	0.015	U	U	
ENDRIN KETONE	0.015	U	U	
GAMMA-BHC (LINDANE)	0.0075	U	U	
GAMMA-CHLORDANE	0.0075	U	U	
HEPTACHLOR	0.0075	U	U	
HEPTACHLOR EPOXIDE	0.0075	U	U	
METHOXYCHLOR	0.0075	U	U	
TOXAPHENE	0.75	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
4,4'-DDD	0.015	U	U	
4,4'-DDE	0.015	U	U	
4,4'-DDT	0.015	U	U	
ALDRIN	0.0075	U	U	
ALPHA-BHC	0.0075	U	U	
ALPHA-CHLORDANE	0.0075	U	U	
AROCLOR-1016	0.38	U	UJ	C
AROCLOR-1221	0.38	U	U	
AROCLOR-1232	0.38	U	U	
AROCLOR-1242	0.38	U	U	
AROCLOR-1248	0.38	U	U	
AROCLOR-1254	0.38	U	U	
AROCLOR-1260	0.38	U	UJ	C
BETA-BHC	0.0075	U	U	
DELTA-BHC	0.0075	U	U	
DIELDRIN	0.015	U	U	
ENDOSULFAN I	0.0075	U	U	
ENDOSULFAN II	0.015	U	U	
ENDOSULFAN SULFATE	0.015	U	U	
ENDRIN	0.015	U	U	
ENDRIN ALDEHYDE	0.015	U	U	
ENDRIN KETONE	0.015	U	U	
GAMMA-BHC (LINDANE)	0.0075	U	U	
GAMMA-CHLORDANE	0.0075	U	U	
HEPTACHLOR	0.0075	U	U	
HEPTACHLOR EPOXIDE	0.0075	U	U	
METHOXYCHLOR	0.0075	U	U	
TOXAPHENE	0.75	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
4,4'-DDD	0.015	U	U	
4,4'-DDE	0.015	U	U	
4,4'-DDT	0.015	U	U	
ALDRIN	0.0075	U	U	
ALPHA-BHC	0.0075	U	U	
ALPHA-CHLORDANE	0.0075	U	U	
AROCLOR-1016	0.38	U	UJ	C
AROCLOR-1221	0.38	U	U	
AROCLOR-1232	0.38	U	U	
AROCLOR-1242	0.38	U	U	
AROCLOR-1248	0.38	U	U	
AROCLOR-1254	0.38	U	U	
AROCLOR-1260	0.38	U	UJ	C
BETA-BHC	0.0075	U	U	
DELTA-BHC	0.0075	U	U	
DIELDRIN	0.015	U	U	
ENDOSULFAN I	0.0075	U	U	
ENDOSULFAN II	0.015	U	U	
ENDOSULFAN SULFATE	0.015	U	U	
ENDRIN	0.015	U	U	
ENDRIN ALDEHYDE	0.015	U	U	
ENDRIN KETONE	0.015	U	U	
GAMMA-BHC (LINDANE)	0.0075	U	U	
GAMMA-CHLORDANE	0.0075	U	U	
HEPTACHLOR	0.0075	U	U	
HEPTACHLOR EPOXIDE	0.0075	U	U	
METHOXYCHLOR	0.0075	U	U	
TOXAPHENE	0.75	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: PEST/PCB

nsample GPT-03-11GW-001
 samp_date 7/1/2007
 lab_id 0707014-04
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-12GW-001
 samp_date 7/1/2007
 lab_id 0707014-05
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-13GW-001
 samp_date 7/1/2007
 lab_id 0707014-06
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
4,4'-DDD	0.015	U	U	
4,4'-DDE	0.015	U	U	
4,4'-DDT	0.015	U	U	
ALDRIN	0.0077	U	U	
ALPHA-BHC	0.0077	U	U	
ALPHA-CHLORDANE	0.0077	U	U	
AROCLOR-1016	0.38	U	UJ	C
AROCLOR-1221	0.38	U	U	
AROCLOR-1232	0.38	U	U	
AROCLOR-1242	0.38	U	U	
AROCLOR-1248	0.38	U	U	
AROCLOR-1254	0.38	U	U	
AROCLOR-1260	0.38	U	UJ	C
BETA-BHC	0.0077	U	U	
DELTA-BHC	0.0077	U	U	
DIELDRIN	0.015	U	U	
ENDOSULFAN I	0.0077	U	U	
ENDOSULFAN II	0.015	U	U	
ENDOSULFAN SULFATE	0.015	U	U	
ENDRIN	0.015	U	U	
ENDRIN ALDEHYDE	0.015	U	U	
ENDRIN KETONE	0.015	U	U	
GAMMA-BHC (LINDANE)	0.0077	U	U	
GAMMA-CHLORDANE	0.0077	U	U	
HEPTACHLOR	0.0077	U	U	
HEPTACHLOR EPOXIDE	0.0077	U	U	
METHOXYCHLOR	0.0077	U	U	
TOXAPHENE	0.77	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
4,4'-DDD	0.015	U	U	
4,4'-DDE	0.015	U	U	
4,4'-DDT	0.015	U	U	
ALDRIN	0.0075	U	U	
ALPHA-BHC	0.0075	U	U	
ALPHA-CHLORDANE	0.0075	U	U	
AROCLOR-1016	0.37	U	UJ	C
AROCLOR-1221	0.37	U	U	
AROCLOR-1232	0.37	U	U	
AROCLOR-1242	0.37	U	U	
AROCLOR-1248	0.37	U	U	
AROCLOR-1254	0.37	U	U	
AROCLOR-1260	0.37	U	UJ	C
BETA-BHC	0.0075	U	U	
DELTA-BHC	0.0075	U	U	
DIELDRIN	0.015	U	U	
ENDOSULFAN I	0.0075	U	U	
ENDOSULFAN II	0.015	U	U	
ENDOSULFAN SULFATE	0.015	U	U	
ENDRIN	0.015	U	U	
ENDRIN ALDEHYDE	0.015	U	U	
ENDRIN KETONE	0.015	U	U	
GAMMA-BHC (LINDANE)	0.0075	U	U	
GAMMA-CHLORDANE	0.0075	U	U	
HEPTACHLOR	0.0075	U	U	
HEPTACHLOR EPOXIDE	0.0075	U	U	
METHOXYCHLOR	0.0075	U	U	
TOXAPHENE	0.75	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
4,4'-DDD	0.017	U	U	
4,4'-DDE	0.017	U	U	
4,4'-DDT	0.017	U	U	
ALDRIN	0.0083	U	U	
ALPHA-BHC	0.0083	U	U	
ALPHA-CHLORDANE	0.0083	U	U	
AROCLOR-1016	0.42	U	UJ	C
AROCLOR-1221	0.42	U	U	
AROCLOR-1232	0.42	U	U	
AROCLOR-1242	0.42	U	U	
AROCLOR-1248	0.42	U	U	
AROCLOR-1254	0.42	U	U	
AROCLOR-1260	0.42	U	UJ	C
BETA-BHC	0.0083	U	U	
DELTA-BHC	0.0083	U	U	
DIELDRIN	0.017	U	U	
ENDOSULFAN I	0.0083	U	U	
ENDOSULFAN II	0.017	U	U	
ENDOSULFAN SULFATE	0.017	U	U	
ENDRIN	0.017	U	U	
ENDRIN ALDEHYDE	0.017	U	U	
ENDRIN KETONE	0.017	U	U	
GAMMA-BHC (LINDANE)	0.0083	U	U	
GAMMA-CHLORDANE	0.0083	U	U	
HEPTACHLOR	0.0083	U	U	
HEPTACHLOR EPOXIDE	0.0083	U	U	
METHOXYCHLOR	0.0083	U	U	
TOXAPHENE	0.83	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: PEST/PCB

nsample GPT-03-13GW-001D
 samp_date 7/1/2007
 lab_id 0707014-07
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF: GPT-03-13GW-001

nsample GPT-03-14GW-001
 samp_date 7/1/2007
 lab_id 0707014-08
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-15GW-001
 samp_date 7/2/2007
 lab_id 0707014-09
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
4,4'-DDD	0.015	U	U	
4,4'-DDE	0.015	U	U	
4,4'-DDT	0.015	U	U	
ALDRIN	0.0074	U	U	
ALPHA-BHC	0.0074	U	U	
ALPHA-CHLORDANE	0.0074	U	U	
AROCLOR-1016	0.37	U	UJ	C
AROCLOR-1221	0.37	U	U	
AROCLOR-1232	0.37	U	U	
AROCLOR-1242	0.37	U	U	
AROCLOR-1248	0.37	U	U	
AROCLOR-1254	0.37	U	U	
AROCLOR-1260	0.37	U	UJ	C
BETA-BHC	0.0074	U	U	
DELTA-BHC	0.0074	U	U	
DIELDRIN	0.015	U	U	
ENDOSULFAN I	0.0074	U	U	
ENDOSULFAN II	0.015	U	U	
ENDOSULFAN SULFATE	0.015	U	U	
ENDRIN	0.015	U	U	
ENDRIN ALDEHYDE	0.015	U	U	
ENDRIN KETONE	0.015	U	U	
GAMMA-BHC (LINDANE)	0.0074	U	U	
GAMMA-CHLORDANE	0.0074	U	U	
HEPTACHLOR	0.0074	U	U	
HEPTACHLOR EPOXIDE	0.0074	U	U	
METHOXYCHLOR	0.0074	U	U	
TOXAPHENE	0.74	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
4,4'-DDD	0.016	U	U	
4,4'-DDE	0.016	U	U	
4,4'-DDT	0.016	U	U	
ALDRIN	0.008	U	U	
ALPHA-BHC	0.008	U	U	
ALPHA-CHLORDANE	0.008	U	U	
AROCLOR-1016	0.4	U	UJ	C
AROCLOR-1221	0.4	U	U	
AROCLOR-1232	0.4	U	U	
AROCLOR-1242	0.4	U	U	
AROCLOR-1248	0.4	U	U	
AROCLOR-1254	0.4	U	U	
AROCLOR-1260	0.4	U	UJ	C
BETA-BHC	0.008	U	U	
DELTA-BHC	0.008	U	U	
DIELDRIN	0.016	U	U	
ENDOSULFAN I	0.008	U	U	
ENDOSULFAN II	0.016	U	U	
ENDOSULFAN SULFATE	0.016	U	U	
ENDRIN	0.016	U	U	
ENDRIN ALDEHYDE	0.016	U	U	
ENDRIN KETONE	0.016	U	U	
GAMMA-BHC (LINDANE)	0.008	U	U	
GAMMA-CHLORDANE	0.008	U	U	
HEPTACHLOR	0.008	U	U	
HEPTACHLOR EPOXIDE	0.008	U	U	
METHOXYCHLOR	0.008	U	U	
TOXAPHENE	0.8	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
4,4'-DDD	0.015	U	U	
4,4'-DDE	0.015	U	U	
4,4'-DDT	0.015	U	U	
ALDRIN	0.0077	U	U	
ALPHA-BHC	0.0077	U	U	
ALPHA-CHLORDANE	0.0077	U	U	
AROCLOR-1016	0.38	U	UJ	C
AROCLOR-1221	0.38	U	U	
AROCLOR-1232	0.38	U	U	
AROCLOR-1242	0.38	U	U	
AROCLOR-1248	0.38	U	U	
AROCLOR-1254	0.38	U	U	
AROCLOR-1260	0.38	U	UJ	C
BETA-BHC	0.0077	U	U	
DELTA-BHC	0.0077	U	U	
DIELDRIN	0.015	U	U	
ENDOSULFAN I	0.0077	U	U	
ENDOSULFAN II	0.015	U	U	
ENDOSULFAN SULFATE	0.015	U	U	
ENDRIN	0.015	U	U	
ENDRIN ALDEHYDE	0.015	U	U	
ENDRIN KETONE	0.015	U	U	
GAMMA-BHC (LINDANE)	0.0077	U	U	
GAMMA-CHLORDANE	0.0077	U	U	
HEPTACHLOR	0.0077	U	U	
HEPTACHLOR EPOXIDE	0.0077	U	U	
METHOXYCHLOR	0.0077	U	U	
TOXAPHENE	0.77	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: PEST/PCB

nsample GPT-03-16GW-001
 samp_date 7/2/2007
 lab_id 0707014-10
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-17GW-001
 samp_date 7/2/2007
 lab_id 0707014-11
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Lab Qual	Val Qual	Qual Code
4,4'-DDD	0.015	U	U	
4,4'-DDE	0.015	U	U	
4,4'-DDT	0.015	U	U	
ALDRIN	0.0077	U	U	
ALPHA-BHC	0.0077	U	U	
ALPHA-CHLORDANE	0.0077	U	U	
AROCLOR-1016	0.38	U	UJ	C
AROCLOR-1221	0.38	U	U	
AROCLOR-1232	0.38	U	U	
AROCLOR-1242	0.38	U	U	
AROCLOR-1248	0.38	U	U	
AROCLOR-1254	0.38	U	U	
AROCLOR-1260	0.38	U	UJ	C
BETA-BHC	0.0077	U	U	
DELTA-BHC	0.0077	U	U	
DIELDRIN	0.015	U	U	
ENDOSULFAN I	0.0077	U	U	
ENDOSULFAN II	0.015	U	U	
ENDOSULFAN SULFATE	0.015	U	U	
ENDRIN	0.015	U	U	
ENDRIN ALDEHYDE	0.015	U	U	
ENDRIN KETONE	0.015	U	U	
GAMMA-BHC (LINDANE)	0.0077	U	U	
GAMMA-CHLORDANE	0.0077	U	U	
HEPTACHLOR	0.0077	U	U	
HEPTACHLOR EPOXIDE	0.0077	U	U	
METHOXYCHLOR	0.0077	U	U	
TOXAPHENE	0.77	U	U	

Parameter	Result	Lab Qual	Val Qual	Qual Code
4,4'-DDD	0.016	U	U	
4,4'-DDE	0.016	U	U	
4,4'-DDT	0.016	U	U	
ALDRIN	0.0081	U	U	
ALPHA-BHC	0.0081	U	U	
ALPHA-CHLORDANE	0.0081	U	U	
AROCLOR-1016	0.4	U	UJ	C
AROCLOR-1221	0.4	U	U	
AROCLOR-1232	0.4	U	U	
AROCLOR-1242	0.4	U	U	
AROCLOR-1248	0.4	U	U	
AROCLOR-1254	0.4	U	U	
AROCLOR-1260	0.4	U	UJ	C
BETA-BHC	0.0081	U	U	
DELTA-BHC	0.0081	U	U	
DIELDRIN	0.016	U	U	
ENDOSULFAN I	0.0081	U	U	
ENDOSULFAN II	0.016	U	U	
ENDOSULFAN SULFATE	0.016	U	U	
ENDRIN	0.016	U	U	
ENDRIN ALDEHYDE	0.016	U	U	
ENDRIN KETONE	0.016	U	U	
GAMMA-BHC (LINDANE)	0.0081	U	U	
GAMMA-CHLORDANE	0.0081	U	U	
HEPTACHLOR	0.0081	U	U	
HEPTACHLOR EPOXIDE	0.0081	U	U	
METHOXYCHLOR	0.0081	U	U	
TOXAPHENE	0.81	U	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: HERB

nsample GPT-03-08GW-001
 samp_date 7/1/2007
 lab_id 0707014-01
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-09GW-001
 samp_date 7/1/2007
 lab_id 0707014-02
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-10GW-001
 samp_date 7/1/2007
 lab_id 0707014-03
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.048	U	
2,4,5-TP (SILVEX)	0.048	U	
2,4-D	0.48	U	
2,4-DB	0.48	U	
DALAPON	1.2	UJ	E
DICAMBA	0.048	U	
DICHLOROPROP	0.48	UJ	E
DINOSEB	0.24	U	
MCPA	48	UJ	E
MCPP	48	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.049	U	
2,4,5-TP (SILVEX)	0.049	U	
2,4-D	0.49	U	
2,4-DB	0.49	U	
DALAPON	1.2	UJ	E
DICAMBA	0.049	U	
DICHLOROPROP	0.49	UJ	E
DINOSEB	0.24	U	
MCPA	49	UJ	E
MCPP	49	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.047	U	
2,4,5-TP (SILVEX)	0.047	U	
2,4-D	0.47	U	
2,4-DB	0.47	U	
DALAPON	1.2	UJ	E
DICAMBA	0.047	U	
DICHLOROPROP	0.47	UJ	E
DINOSEB	0.23	U	
MCPA	47	UJ	E
MCPP	47	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: HERB

nsample GPT-03-11GW-001
 samp_date 7/1/2007
 lab_id 0707014-04
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-12GW-001
 samp_date 7/1/2007
 lab_id 0707014-05
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-13GW-001
 samp_date 7/1/2007
 lab_id 0707014-06
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.049	U	
2,4,5-TP (SILVEX)	0.049	U	
2,4-D	0.49	U	
2,4-DB	0.49	U	
DALAPON	1.2	UJ	E
DICAMBA	0.2	U	
DICHLOROPROP	0.49	UJ	E
DINOSEB	0.24	U	
MCPA	49	UJ	E
MCPD	49	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.046	U	
2,4,5-TP (SILVEX)	0.046	U	
2,4-D	0.46	U	
2,4-DB	0.46	U	
DALAPON	1.2	UJ	E
DICAMBA	0.046	U	
DICHLOROPROP	0.46	UJ	E
DINOSEB	0.23	U	
MCPA	46	UJ	E
MCPD	46	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.046	U	
2,4,5-TP (SILVEX)	0.046	U	
2,4-D	0.46	U	
2,4-DB	0.46	U	
DALAPON	1.2	UJ	E
DICAMBA	0.046	U	
DICHLOROPROP	0.46	UJ	E
DINOSEB	0.23	U	
MCPA	46	UJ	E
MCPD	46	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: HERB

nsample GPT-03-13GW-001D
 samp_date 7/1/2007
 lab_id 0707014-07
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF: GPT-03-13GW-001

nsample GPT-03-14GW-001
 samp_date 7/1/2007
 lab_id 0707014-08
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample GPT-03-15GW-001
 samp_date 7/2/2007
 lab_id 0707014-09
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.046	U	
2,4,5-TP (SILVEX)	0.046	U	
2,4-D	0.46	U	
2,4-DB	0.46	U	
DALAPON	1.2	UJ	E
DICAMBA	0.046	U	
DICHLOROPROP	0.46	UJ	E
DINOSEB	0.23	U	
MCPA	46	UJ	E
MCPP	46	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.05	U	
2,4,5-TP (SILVEX)	0.05	U	
2,4-D	0.5	U	
2,4-DB	0.5	U	
DALAPON	1.2	UJ	E
DICAMBA	0.05	U	
DICHLOROPROP	0.5	UJ	E
DINOSEB	0.25	U	
MCPA	50	UJ	E
MCPP	50	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.049	U	
2,4,5-TP (SILVEX)	0.049	U	
2,4-D	0.49	U	
2,4-DB	0.49	U	
DALAPON	1.2	UJ	E
DICAMBA	0.2	U	
DICHLOROPROP	0.49	UJ	E
DINOSEB	0.24	U	
MCPA	49	UJ	E
MCPP	49	U	

PROJ_NO: 00464

SDG: 0707014 MEDIA: WATER DATA FRACTION: HERB

nsample GPT-03-16GW-001
samp_date 7/2/2007
lab_id 0707014-10
qc_type NM
units UG/L
Pct_Solids
DUP_OF:

nsample GPT-03-17GW-001
samp_date 7/2/2007
lab_id 0707014-11
qc_type NM
units UG/L
Pct_Solids
DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.049	U	
2,4,5-TP (SILVEX)	0.049	U	
2,4-D	0.49	U	
2,4-DB	0.49	U	
DALAPON	1.2	UJ	E
DICAMBA	0.049	U	
DICHLOROPROP	0.49	UJ	E
DINOSEB	0.24	U	
MCPA	49	UJ	E
MCPD	49	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.049	U	
2,4,5-TP (SILVEX)	0.049	U	
2,4-D	0.49	U	
2,4-DB	0.49	U	
DALAPON	1.2	UJ	E
DICAMBA	0.42	U	
DICHLOROPROP	0.49	UJ	E
DINOSEB	0.24	U	
MCPA	49	UJ	E
MCPD	49	U	

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DATE: OCTOBER 12, 2007

Laboratory Blank Analyses

The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

<u>Analyte</u>	<u>Maximum Concentration</u>	<u>Action Level (mg/kg)</u>
Aluminum ⁽¹⁾	16.985 mg/kg	84.9
Lead	1.80 ug/L	1.80

⁽¹⁾ Maximum concentration is present in the laboratory preparation blank.

An action level of 5X the maximum concentration was used to evaluate the sample data for blank contamination. Sample aliquot, percent solids, and dilution factors, if applicable, were taken into consideration when evaluating for blank contamination. Positive results less than the blank action level for lead were qualified "U" due to blank contamination.

Notes

Several analyte concentrations were reported as single whole numbers (e.g. 1). The data validator corrected the database so that those results are reported to the tenths decimal place.

Samples 03SB0101 and 03SB0201 were originally reported incorrectly in the database as samples 035B0101 and 035B0201. A database specialist made the correction at the request of the data validator.

Executive Summary

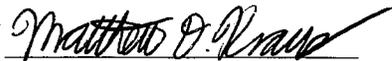
Laboratory Performance: Calcium was qualified due to a continuing calibration noncompliance. Lead was qualified due to laboratory blank contamination.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", October 2004 and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DoD QSM and the Quality Assurance Project Plan (QAPP)."



Tetra Tech NUS
Matthew D. Kraus
Environmental Chemist



Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

TO: FISHER, R – PAGE 3
DATE: OCTOBER 12, 2007

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: M

nsample 03SB0101
 samp_date 8/14/2007
 lab_id 0708135-01
 qc_type NM
 units MG/KG
 Pct_Solids 88.6
 DUP_OF:

nsample 03SB0201
 samp_date 8/14/2007
 lab_id 0708135-02
 qc_type NM
 units MG/KG
 Pct_Solids 85.1
 DUP_OF:

nsample 03SB0301
 samp_date 8/15/2007
 lab_id 0708160-01
 qc_type NM
 units MG/KG
 Pct_Solids 85.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	500		
ANTIMONY	1	U	
ARSENIC	0.61	U	
BARIUM	2.5		
BERYLLIUM	0.2	U	
CADMIUM	0.2	U	
CALCIUM	204	U	
CHROMIUM	1.0		
COBALT	1.0	U	
COPPER	1.0	U	
IRON	107		
LEAD	1.2	U	A
MAGNESIUM	204	U	
MANGANESE	0.88		
MERCURY	0.014	U	
NICKEL	1.0	U	
POTASSIUM	204	U	
SELENIUM	0.61	U	
SILVER	0.2	U	
SODIUM	204	U	
THALLIUM	0.61	U	
VANADIUM	1.0	U	
ZINC	1.0	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	1570		
ANTIMONY	1.1	U	
ARSENIC	0.68	U	
BARIUM	4.5		
BERYLLIUM	0.23	U	
CADMIUM	0.23	U	
CALCIUM	226	U	
CHROMIUM	1.7		
COBALT	1.1	U	
COPPER	1.1	U	
IRON	126		
LEAD	1.1	U	A
MAGNESIUM	226	U	
MANGANESE	0.74		
MERCURY	0.014	U	
NICKEL	1.1	U	
POTASSIUM	226	U	
SELENIUM	0.68	U	
SILVER	0.23	U	
SODIUM	226	U	
THALLIUM	0.68	U	
VANADIUM	1.1	U	
ZINC	1.1	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	3280		
ANTIMONY	1.2	U	
ARSENIC	0.7	U	
BARIUM	12.3		
BERYLLIUM	0.23	U	
CADMIUM	0.23	U	
CALCIUM	378		
CHROMIUM	4.2		
COBALT	1.2	U	
COPPER	1.2	U	
IRON	729		
LEAD	5.9		
MAGNESIUM	233	U	
MANGANESE	3.4		
MERCURY	0.024		
NICKEL	1.2	U	
POTASSIUM	233	U	
SELENIUM	0.7	U	
SILVER	0.23	U	
SODIUM	233	U	
THALLIUM	0.7	U	
VANADIUM	4.7		
ZINC	7.7		



Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: R. FISHER DATE: OCTOBER 18, 2007

FROM: EDWARD SEDLMYER COPIES: DV FILE

**SUBJECT: ORGANIC DATA VALIDATION- VOA/SVOA/PEST/PCB/HERB
CTO 041, NCBC Gulfport
SDG GPSITE3-001**

SAMPLES: 11/Solid

03SB0101	03SB0201	03SB0301
03SB0401	03SB0501	03SB0601
03SB0701	03SB0801	03SB0901
03SB0901D	03SB1001	

1/Aqueous

TRIP BLANK 4741

OVERVIEW

The sample set for CTO 041 NCBC Gulfport, SDG GPSITE3-001 consists of one (1) trip blank and eleven (11) solid environmental samples. The following field duplicate pair was contained in this SDG: 03SB0901 / 03SB0901D. All samples except the trip blank, were analyzed for Target Compound List (TCL) volatile organic compounds (VOC), semivolatile organic compounds, organochloride pesticides (PEST), polychlorinated biphenyls (PCB), and herbicides (HERB). The trip blank was analyzed for VOCs only.

The samples were collected by TetraTech NUS on August 14 thru 17, 2007 and analyzed by Empirical Laboratories. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using SW-846 Methods 8260B, 8270C, 8081A, 8082, and 8151A analysis and reporting protocols. The data contained in this SDG were validated with regard to the following parameters:

- * • Data completeness
- * • Holding times
- Initial/continuing calibrations
- * • Laboratory method blank results
- * • Field Duplicate Precision
- * • Detection Limits

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

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DATE: October 18, 2007

Volatiles

The following compounds were detected in the method blanks or trip blanks:

<u>Compound</u>	<u>Maximum Concentration</u>	<u>Blank Action Level</u>
Methylene chloride	0.89 ug/kg	8.9 ug/kg
Acetone ⁽¹⁾	5.3 ug/L	53 ug/L

An action level of 10X the maximum contaminant concentration was established for methylene chloride and acetone to evaluate laboratory contamination. Dilution factors, percent moisture, and sample aliquots were taken into consideration during the application of all action levels. The positive results for acetone and methylene chloride below the blank action level were qualified as non-detected, U. Trip blanks were not qualified due to method blank contamination.

The continuing calibration percent difference for methylene chloride run on instrument VOA1 on August 16, 2007 at 10:59 was greater than the 25% quality control criteria. No actions were taken for this noncompliance because all results were nondetected.

Semivolatile

Calibration verification had %Ds that exceeded the 25% quality control limit for benzaldehyde, bis(2-ethylhexyl)phthalate, 3,3'-dichlorobenzidine, 2,4-dinitrophenol, hexachlorocyclopentadiene, 2-nitroaniline, and 4-nitrophenol on 08/15/07 @ 15:34. No actions were taken for these noncompliances because all results were nondetected.

Calibration verification had a %D that exceeded the 25% quality control limit for caprolactam, 3,3'-dichlorobenzidine, 4,6-dinitro-2-methylphenol, 2,4-dinitrophenol, hexachlorocyclopentadiene, and 4-nitrophenol on 08/17/07 @ 06:03. No actions were taken for these noncompliances because all results were nondetected.

Calibration verification had a %D that exceeded the 25% quality control limit for benzaldehyde, carbazole, 4-chloroaniline, 3,3'-dichlorobenzidine, 4,6-dinitro-2-methylphenol, 2,4-dinitrophenol, and 3-nitroaniline on 08/27/07 @ 07:32. No actions were taken for these noncompliances because all results were nondetected.

Calibration verification had a %D that exceeded the 25% quality control limit for atrazine, benzaldehyde, 4,6-dinitro-2-methylphenol, 2,4-dinitrophenol, and hexachlorocyclopentadiene on 08/29/07 @ 06:44. No actions were taken for these noncompliances because all results were nondetected.

Calibration verification had a %D that exceeded the 25% quality control limit for atrazine, benzaldehyde, carbazole, 2,4-dinitrophenol, and hexachlorocyclopentadiene on 08/31/07 @ 07:12. No actions were taken for these noncompliances because all results were nondetected.

Calibration verification had a %D that exceeded the 25% quality control limit for atrazine, benzaldehyde, carbazole, 3,3'-dichlorobenzidine, 2,4-dinitrophenol, hexachlorocyclopentadiene, and 4-nitrophenol on 09/04/07 @ 08:48. No actions were taken for these noncompliances because all results were nondetected.

Organochloride Pesticides

Continuing calibration %Ds exceeded the 15% quality control limit on 08/25/07 @06:48 on the primary column for alpha-BHC, gamma-BHC, beta-BHC, delta-BHC, heptachlor, aldrin, gamma-chlordane, 4,4'-DDE, dieldrin, endrin, 4,4'-DDD, endosulfan II, endrin aldehyde, 4,4'-DDT, methoxychlor, and endrin ketone. The confirmation

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DATE: October 18, 2007

column had acceptable %Ds. Positive results for 4,4'-DDT, 4,4'-DDE, 4,4'-DDE, gamma-BHC, and gamma-chlordane reported from the primary column were qualified as estimated, J. No action was taken for the remaining analytes because either positive results were reported from the secondary column or the results were nondetected.

Continuing calibration %Ds exceeded the 15% quality control limit on 08/25/07 @11:26 on the primary column for alpha-BHC, gamma-BHC, beta-BHC, delta-BHC, heptachlor, aldrin, gamma-chlordane, endosulfan I, 4,4'-DDE, dieldrin, endrin, 4,4'-DDD, endosulfan II, endrin aldehyde, 4,4'-DDT, and endrin ketone. Positive results for 4,4'-DDT, 4,4'-DDE, 4,4'-DDE, gamma-BHC, and gamma-chlordane reported from the primary column were qualified as estimated, J. No action was taken for the remaining analytes because either positive results were reported from the secondary column or the results were nondetected.

Continuing calibration %Ds exceeded the 15% quality control limit on 08/25/07 @17:01 on the primary column for alpha-BHC, gamma-BHC, and delta-BHC. The confirmation column had acceptable %Ds. No actions were taken for these noncompliances because all results were nondetected.

Continuing calibration %Ds exceeded the 15% quality control limit on 08/25/07 @23:33 on the primary column for alpha-BHC and delta-BHC. The confirmation column had acceptable %Ds. No actions were taken for these noncompliances because all results were nondetected.

Continuing calibration average %D exceeded the 15% quality control limit on 08/25/07 @ 06:29 on the primary column for toxaphene. The confirmation column had an acceptable average %D. No actions were taken for this noncompliance because all results were nondetected.

Continuing calibration average %D exceeded the 15% quality control limit on 08/25/07 @ 16:43 on the secondary column for toxaphene. The primary column had an acceptable average %D. No actions were taken for this noncompliance because all results were nondetected.

PCBs

The continuing calibration average %D exceeded the 15% quality control limit on 08/25/07 @07:06 on the primary column for Aroclor-1016. The confirmation column had an acceptable average %D. No actions were taken for this noncompliance because all results were nondetected.

The continuing calibration average %D exceeded the 15% quality control limit on 08/25/07 @11:45 on the primary column and confirmation column for Aroclor-1260. No actions were taken for this noncompliance because all results were nondetected.

The continuing calibration average %D exceeded the 15% quality control limit on 08/25/07 @17:20 on the primary column for Aroclor-1016. The confirmation column had an acceptable average %D. No actions were taken for this noncompliance because all results were nondetected.

The continuing calibration average %D exceeded the 15% quality control limit on 08/25/07 @23:52 on the primary column and confirmation column for Aroclor-1260. No actions were taken for this noncompliance because all results were nondetected.

Herbicides

Continuing calibration %Ds exceeded the 15% quality control limit on 08/20/07 @10:27 on the primary column for 2,4-DB and dinoseb. The confirmation column had acceptable %Ds. No actions were taken for these noncompliances because all results were nondetected.

Continuing calibration %Ds exceeded the 15% quality control limit on 08/20/07 @19:18 on the primary column

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DATE: October 18, 2007

for MCPP, MCPA, 2,4-D, 2,4,5-T, 2,4-DB, and dinoseb. The confirmation column had a high %D for dichloroprop. No actions were taken for these noncompliances because all results were nondetected.

Continuing calibration %Ds exceeded the 15% quality control limit on 08/21/07 @01:11 on the primary column for MCPP, 2,4-DB, and dinoseb. The confirmation column had a high %Ds for dicamba and dichloroprop. No actions were taken for these noncompliances because all results were nondetected.

Additional Comments:

Positive results reported below the quantitation limit but above the method detection limit (MDL) were qualified as estimated, J.

Nondetected results were reported to the MDLs.

EXECUTIVE SUMMARY

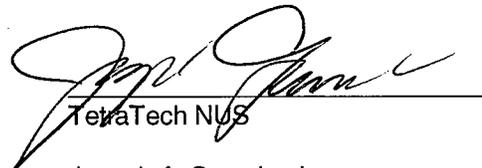
Laboratory Performance Issues: Two VOC compounds were detected in the method or trip blanks. Continuing calibrations for all fractions exceeded %D criteria for several compounds.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999), and Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the DoD QSM."


Tetra Tech NUS
Edward Sedlmyer
Chemist/Data Validator


TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

- Appendix A – Qualified Analytical Results
- Appendix B – Results as Reported by the Laboratory
- Appendix C – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: WATER DATA FRACTION: OV

nsample TRIP BLANK 4741
 samp_date 8/14/2007
 lab_id 0708135-03
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

nsample TRIP BLANK 4741
 samp_date 8/14/2007
 lab_id 0708135-03
 qc_type NM
 units UG/L
 Pct_Solids
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	0.9	U	
1,1,2,2-TETRACHLOROETHANE	0.43	U	
1,1,2-TRICHLOROETHANE	0.35	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.55	U	
1,1-DICHLOROETHANE	0.54	U	
1,1-DICHLOROETHENE	1.2	U	
1,2,4-TRICHLOROBENZENE	0.18	U	
1,2-DIBROMO-3-CHLOROPROPANE	1.2	U	
1,2-DIBROMOETHANE	0.43	U	
1,2-DICHLOROBENZENE	0.37	U	
1,2-DICHLOROETHANE	0.46	U	
1,2-DICHLOROPROPANE	0.46	U	
1,3-DICHLOROBENZENE	0.84	U	
1,4-DICHLOROBENZENE	0.55	U	
2-BUTANONE	1.4	U	
2-HEXANONE	2.3	U	
4-METHYL-2-PENTANONE	0.58	U	
ACETONE	5.3	J	P
BENZENE	0.47	U	
BROMODICHLOROMETHANE	0.3	U	
BROMOFORM	1	U	
BROMOMETHANE	0.72	U	
CARBON DISULFIDE	1.3	U	
CARBON TETRACHLORIDE	0.88	U	
CHLOROBENZENE	2.5	U	
CHLORODIBROMOMETHANE	0.34	U	
CHLOROETHANE	1.1	U	
CHLOROFORM	0.55	U	
CHLOROMETHANE	0.52	U	
CIS-1,2-DICHLOROETHENE	1.2	U	
CIS-1,3-DICHLOROPROPENE	0.5	U	
CYCLOHEXANE	0.54	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	1.1	U	
ETHYLBENZENE	0.75	U	
ISOPROPYLBENZENE	0.88	U	
METHYL ACETATE	1.6	U	
METHYL CYCLOHEXANE	0.3	U	
METHYL TERT-BUTYL ETHER	0.32	U	
METHYLENE CHLORIDE	0.62	U	
STYRENE	0.35	U	
TETRACHLOROETHENE	0.97	U	
TOLUENE	0.86	U	
TOTAL XYLENES	0.7	U	
TRANS-1,2-DICHLOROETHENE	1.1	U	
TRANS-1,3-DICHLOROPROPENE	0.32	U	
TRICHLOROETHENE	0.85	U	
TRICHLOROFLUOROMETHANE	0.95	U	
VINYL CHLORIDE	1.1	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OV

nsample 03SB0101
 samp_date 8/14/2007
 lab_id 0708135-01
 qc_type NM
 units UG/KG
 Pct_Solids 88.6
 DUP_OF:

nsample 03SB0101
 samp_date 8/14/2007
 lab_id 0708135-01
 qc_type NM
 units UG/KG
 Pct_Solids 88.6
 DUP_OF:

nsample 03SB0201
 samp_date 8/14/2007
 lab_id 0708135-02
 qc_type NM
 units UG/KG
 Pct_Solids 85.1
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	0.48	U	
1,1,2-TRICHLOROETHANE	0.4	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.62	U	
1,1-DICHLOROETHANE	0.61	U	
1,1-DICHLOROETHENE	1.4	U	
1,2,4-TRICHLOROBENZENE	0.2	U	
1,2-DIBROMO-3-CHLOROPROPANE	1.4	U	
1,2-DIBROMOETHANE	0.48	U	
1,2-DICHLOROBENZENE	0.42	U	
1,2-DICHLOROETHANE	0.52	U	
1,2-DICHLOROPROPANE	0.52	U	
1,3-DICHLOROBENZENE	0.95	U	
1,4-DICHLOROBENZENE	0.62	U	
2-BUTANONE	1.6	U	
2-HEXANONE	2.6	U	
4-METHYL-2-PENTANONE	0.65	U	
ACETONE	2.2	U	
BENZENE	0.53	U	
BROMODICHLOROMETHANE	0.34	U	
BROMOFORM	1.1	U	
BROMOMETHANE	0.81	U	
CARBON DISULFIDE	1.5	U	
CARBON TETRACHLORIDE	0.99	U	
CHLOROBENZENE	2.8	U	
CHLORODIBROMOMETHANE	0.38	U	
CHLOROETHANE	1.2	U	
CHLOROFORM	0.62	U	
CHLOROMETHANE	0.59	U	
CIS-1,2-DICHLOROETHENE	1.4	U	
CIS-1,3-DICHLOROPROPENE	0.56	U	
CYCLOHEXANE	0.61	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	1.2	U	
ETHYLBENZENE	0.85	U	
ISOPROPYLBENZENE	0.99	U	
METHYL ACETATE	1.8	U	
METHYL CYCLOHEXANE	0.34	U	
METHYL TERT-BUTYL ETHER	0.36	U	
METHYLENE CHLORIDE	0.7	U	
STYRENE	0.4	U	
TETRACHLOROETHENE	1.1	U	
TOLUENE	0.97	U	
TOTAL XYLENES	0.79	U	
TRANS-1,2-DICHLOROETHENE	1.2	U	
TRANS-1,3-DICHLOROPROPENE	0.36	U	
TRICHLOROETHENE	0.96	U	
TRICHLOROFLUOROMETHANE	1.1	U	
VINYL CHLORIDE	1.2	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	0.48	U	
1,1,2-TRICHLOROETHANE	0.39	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.61	U	
1,1-DICHLOROETHANE	0.6	U	
1,1-DICHLOROETHENE	1.3	U	
1,2,4-TRICHLOROBENZENE	0.2	U	
1,2-DIBROMO-3-CHLOROPROPANE	1.3	U	
1,2-DIBROMOETHANE	0.48	U	
1,2-DICHLOROBENZENE	0.41	U	
1,2-DICHLOROETHANE	0.51	U	
1,2-DICHLOROPROPANE	0.51	U	
1,3-DICHLOROBENZENE	0.93	U	
1,4-DICHLOROBENZENE	0.61	U	
2-BUTANONE	1.6	U	
2-HEXANONE	2.5	U	
4-METHYL-2-PENTANONE	0.64	U	
ACETONE	5.4	U	B
BENZENE	0.52	U	
BROMODICHLOROMETHANE	0.33	U	
BROMOFORM	1.1	U	
BROMOMETHANE	0.8	U	
CARBON DISULFIDE	1.4	U	
CARBON TETRACHLORIDE	0.98	U	
CHLOROBENZENE	2.8	U	
CHLORODIBROMOMETHANE	0.38	U	
CHLOROETHANE	1.2	U	
CHLOROFORM	0.61	U	
CHLOROMETHANE	0.58	U	
CIS-1,2-DICHLOROETHENE	1.3	U	
CIS-1,3-DICHLOROPROPENE	0.55	U	
CYCLOHEXANE	0.6	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OV

nsample 03SB0201
 samp_date 8/14/2007
 lab_id 0708135-02
 qc_type NM
 units UG/KG
 Pct_Solids 85.1
 DUP_OF:

nsample 03SB0301
 samp_date 8/15/2007
 lab_id 0708160-01
 qc_type NM
 units UG/KG
 Pct_Solids 85.4
 DUP_OF:

nsample 03SB0301
 samp_date 8/15/2007
 lab_id 0708160-01
 qc_type NM
 units UG/KG
 Pct_Solids 85.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	1.2	U	
ETHYLBENZENE	0.83	U	
ISOPROPYLBENZENE	0.98	U	
METHYL ACETATE	1.8	U	
METHYL CYCLOHEXANE	0.33	U	
METHYL TERT-BUTYL ETHER	0.35	U	
METHYLENE CHLORIDE	0.69	U	
STYRENE	0.39	U	
TETRACHLOROETHENE	1.1	U	
TOLUENE	0.95	U	
TOTAL XYLENES	0.78	U	
TRANS-1,2-DICHLOROETHENE	1.2	U	
TRANS-1,3-DICHLOROPROPENE	0.35	U	
TRICHLOROETHENE	0.94	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1.2	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	0.91	U	
1,1,2,2-TETRACHLOROETHANE	0.43	U	
1,1,2-TRICHLOROETHANE	0.35	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.56	U	
1,1-DICHLOROETHANE	0.54	U	
1,1-DICHLOROETHENE	1.2	U	
1,2,4-TRICHLOROBENZENE	0.18	U	
1,2-DIBROMO-3-CHLOROPROPANE	1.2	U	
1,2-DIBROMOETHANE	0.43	U	
1,2-DICHLOROBENZENE	0.37	U	
1,2-DICHLOROETHANE	0.46	U	
1,2-DICHLOROPROPANE	0.46	U	
1,3-DICHLOROBENZENE	0.85	U	
1,4-DICHLOROBENZENE	0.56	U	
2-BUTANONE	1.4	U	
2-HEXANONE	2.3	U	
4-METHYL-2-PENTANONE	0.58	U	
ACETONE	9	U	B
BENZENE	0.47	U	
BROMODICHLOROMETHANE	0.3	U	
BROMOFORM	1	U	
BROMOMETHANE	0.73	U	
CARBON DISULFIDE	1.3	U	
CARBON TETRACHLORIDE	0.89	U	
CHLOROBENZENE	0.34	U	
CHLORODIBROMOMETHANE	0.34	U	
CHLOROETHANE	1.1	U	
CHLOROFORM	0.56	U	
CHLOROMETHANE	0.52	U	
CIS-1,2-DICHLOROETHENE	1.2	U	
CIS-1,3-DICHLOROPROPENE	0.5	U	
CYCLOHEXANE	0.54	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	1.1	U	
ETHYLBENZENE	0.76	U	
ISOPROPYLBENZENE	0.89	U	
METHYL ACETATE	1.6	U	
METHYL CYCLOHEXANE	0.3	U	
METHYL TERT-BUTYL ETHER	0.32	U	
METHYLENE CHLORIDE	0.62	U	
STYRENE	0.35	U	
TETRACHLOROETHENE	0.98	U	
TOLUENE	0.87	U	
TOTAL XYLENES	0.71	U	
TRANS-1,2-DICHLOROETHENE	1.1	U	
TRANS-1,3-DICHLOROPROPENE	0.32	U	
TRICHLOROETHENE	0.86	U	
TRICHLOROFLUOROMETHANE	0.96	U	
VINYL CHLORIDE	3.7	J	P

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OV

nsample 03SB0401
 samp_date 8/15/2007
 lab_id 0708160-02
 qc_type NM
 units UG/KG
 Pct_Solids 80.7
 DUP_OF:

nsample 03SB0401
 samp_date 8/15/2007
 lab_id 0708160-02
 qc_type NM
 units UG/KG
 Pct_Solids 80.7
 DUP_OF:

nsample 03SB0501
 samp_date 8/15/2007
 lab_id 0708160-03
 qc_type NM
 units UG/KG
 Pct_Solids 81.1
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	0.96	U	
1,1,2,2-TETRACHLOROETHANE	0.46	U	
1,1,2-TRICHLOROETHANE	0.37	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.59	U	
1,1-DICHLOROETHANE	0.58	U	
1,1-DICHLOROETHENE	1.3	U	
1,2,4-TRICHLOROBENZENE	0.19	U	
1,2-DIBROMO-3-CHLOROPROPANE	1.3	U	
1,2-DIBROMOETHANE	0.46	U	
1,2-DICHLOROBENZENE	0.4	U	
1,2-DICHLOROETHANE	0.49	U	
1,2-DICHLOROPROPANE	0.49	U	
1,3-DICHLOROBENZENE	0.9	U	
1,4-DICHLOROBENZENE	0.59	U	
2-BUTANONE	1.5	U	
2-HEXANONE	2.4	U	
4-METHYL-2-PENTANONE	0.62	U	
ACETONE	3.4	U	B
BENZENE	0.5	U	
BROMODICHLOROMETHANE	0.32	U	
BROMOFORM	1.1	U	
BROMOMETHANE	0.77	U	
CARBON DISULFIDE	1.4	U	
CARBON TETRACHLORIDE	0.94	U	
CHLOROBENZENE	0.36	U	
CHLORODIBROMOMETHANE	0.36	U	
CHLOROETHANE	1.2	U	
CHLOROFORM	0.59	U	
CHLOROMETHANE	0.56	U	
CIS-1,2-DICHLOROETHENE	1.3	U	
CIS-1,3-DICHLOROPROPENE	0.53	U	
CYCLOHEXANE	0.58	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	1.2	U	
ETHYLBENZENE	0.8	U	
ISOPROPYLBENZENE	0.94	U	
METHYL ACETATE	1.7	U	
METHYL CYCLOHEXANE	0.32	U	
METHYL TERT-BUTYL ETHER	0.34	U	
METHYLENE CHLORIDE	5.6	U	A
STYRENE	0.37	U	
TETRACHLOROETHENE	1	U	
TOLUENE	0.92	U	
TOTAL XYLENES	0.75	U	
TRANS-1,2-DICHLOROETHENE	1.2	U	
TRANS-1,3-DICHLOROPROPENE	0.34	U	
TRICHLOROETHENE	0.91	U	
TRICHLOROFUOROMETHANE	1	U	
VINYL CHLORIDE	1.2	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	0.99	U	
1,1,2,2-TETRACHLOROETHANE	0.47	U	
1,1,2-TRICHLOROETHANE	0.38	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.6	U	
1,1-DICHLOROETHANE	0.59	U	
1,1-DICHLOROETHENE	1.3	U	
1,2,4-TRICHLOROBENZENE	0.2	U	
1,2-DIBROMO-3-CHLOROPROPANE	1.3	U	
1,2-DIBROMOETHANE	0.47	U	
1,2-DICHLOROBENZENE	0.41	U	
1,2-DICHLOROETHANE	0.51	U	
1,2-DICHLOROPROPANE	0.51	U	
1,3-DICHLOROBENZENE	0.92	U	
1,4-DICHLOROBENZENE	0.6	U	
2-BUTANONE	1.5	U	
2-HEXANONE	2.5	U	
4-METHYL-2-PENTANONE	0.64	U	
ACETONE	7.7	U	B
BENZENE	0.52	U	
BROMODICHLOROMETHANE	0.33	U	
BROMOFORM	1.1	U	
BROMOMETHANE	0.79	U	
CARBON DISULFIDE	1.4	U	
CARBON TETRACHLORIDE	0.97	U	
CHLOROBENZENE	0.37	U	
CHLORODIBROMOMETHANE	0.37	U	
CHLOROETHANE	1.2	U	
CHLOROFORM	0.6	U	
CHLOROMETHANE	0.57	U	
CIS-1,2-DICHLOROETHENE	1.3	U	
CIS-1,3-DICHLOROPROPENE	0.55	U	
CYCLOHEXANE	0.59	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OV

nsample 03SB0501
 samp_date 8/15/2007
 lab_id 0708160-03
 qc_type NM
 units UG/KG
 Pct_Solids 81.1
 DUP_OF:

nsample 03SB0601
 samp_date 8/16/2007
 lab_id 0708185-01
 qc_type NM
 units UG/KG
 Pct_Solids 83.1
 DUP_OF:

nsample 03SB0601
 samp_date 8/16/2007
 lab_id 0708185-01
 qc_type NM
 units UG/KG
 Pct_Solids 83.1
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	1.2	U	
ETHYLBENZENE	0.82	U	
ISOPROPYLBENZENE	0.97	U	
METHYL ACETATE	1.8	U	
METHYL CYCLOHEXANE	0.33	U	
METHYL TERT-BUTYL ETHER	0.35	U	
METHYLENE CHLORIDE	0.68	U	
STYRENE	0.38	U	
TETRACHLOROETHENE	1.1	U	
TOLUENE	0.95	U	
TOTAL XYLENES	0.77	U	
TRANS-1,2-DICHLOROETHENE	1.2	U	
TRANS-1,3-DICHLOROPROPENE	0.35	U	
TRICHLOROETHENE	0.94	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1.2	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	0.97	U	
1,1,2,2-TETRACHLOROETHANE	0.46	U	
1,1,2-TRICHLOROETHANE	0.38	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.59	U	
1,1-DICHLOROETHANE	0.58	U	
1,1-DICHLOROETHENE	1.3	U	
1,2,4-TRICHLOROBENZENE	0.19	U	
1,2-DIBROMO-3-CHLOROPROPANE	1.3	U	
1,2-DIBROMOETHANE	0.46	U	
1,2-DICHLOROBENZENE	0.4	U	
1,2-DICHLOROETHANE	0.49	U	
1,2-DICHLOROPROPANE	0.49	U	
1,3-DICHLOROBENZENE	0.9	U	
1,4-DICHLOROBENZENE	0.59	U	
2-BUTANONE	1.5	U	
2-HEXANONE	2.5	U	
4-METHYL-2-PENTANONE	0.62	U	
ACETONE	7	U	B
BENZENE	0.5	U	
BROMODICHLOROMETHANE	0.32	U	
BROMOFORM	1.1	U	
BROMOMETHANE	0.77	U	
CARBON DISULFIDE	6		
CARBON TETRACHLORIDE	0.94	U	
CHLOROBENZENE	0.36	U	
CHLORODIBROMOMETHANE	0.36	U	
CHLOROETHANE	1.2	U	
CHLOROFORM	0.59	U	
CHLOROMETHANE	0.56	U	
CIS-1,2-DICHLOROETHENE	3.2	J	P
CIS-1,3-DICHLOROPROPENE	0.54	U	
CYCLOHEXANE	0.58	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	1.2	U	
ETHYLBENZENE	0.8	U	
ISOPROPYLBENZENE	0.94	U	
METHYL ACETATE	1.7	U	
METHYL CYCLOHEXANE	0.32	U	
METHYL TERT-BUTYL ETHER	0.34	U	
METHYLENE CHLORIDE	1	U	A
STYRENE	0.38	U	
TETRACHLOROETHENE	1	U	
TOLUENE	0.92	U	
TOTAL XYLENES	0.75	U	
TRANS-1,2-DICHLOROETHENE	1.2	U	
TRANS-1,3-DICHLOROPROPENE	0.34	U	
TRICHLOROETHENE	0.91	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1.2	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OV

nsample 03SB0701
 samp_date 8/16/2007
 lab_id 0708185-03
 qc_type NM
 units UG/KG
 Pct_Solids 87.1
 DUP_OF:

nsample 03SB0701
 samp_date 8/16/2007
 lab_id 0708185-03
 qc_type NM
 units UG/KG
 Pct_Solids 87.1
 DUP_OF:

nsample 03SB0801
 samp_date 8/16/2007
 lab_id 0708185-02
 qc_type NM
 units UG/KG
 Pct_Solids 84.7
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	0.96	U	
1,1,2,2-TETRACHLOROETHANE	0.46	U	
1,1,2-TRICHLOROETHANE	0.37	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.58	U	
1,1-DICHLOROETHANE	0.57	U	
1,1-DICHLOROETHENE	1.3	U	
1,2,4-TRICHLOROBENZENE	0.19	U	
1,2-DIBROMO-3-CHLOROPROPANE	1.3	U	
1,2-DIBROMOETHANE	0.46	U	
1,2-DICHLOROBENZENE	0.39	U	
1,2-DICHLOROETHANE	0.49	U	
1,2-DICHLOROPROPANE	0.49	U	
1,3-DICHLOROBENZENE	0.89	U	
1,4-DICHLOROBENZENE	0.58	U	
2-BUTANONE	1.9	J	P
2-HEXANONE	2.4	U	
4-METHYL-2-PENTANONE	1.1	J	P
ACETONE	2.1	U	
BENZENE	0.5	U	
BROMODICHLOROMETHANE	0.32	U	
BROMOFORM	1.1	U	
BROMOMETHANE	0.76	U	
CARBON DISULFIDE	1.4	U	
CARBON TETRACHLORIDE	0.94	U	
CHLOROBENZENE	0.36	U	
CHLORODIBROMOMETHANE	0.36	U	
CHLOROETHANE	1.2	U	
CHLOROFORM	0.58	U	
CHLOROMETHANE	0.55	U	
CIS-1,2-DICHLOROETHENE	1.3	U	
CIS-1,3-DICHLOROPROPENE	0.53	U	
CYCLOHEXANE	0.57	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	1.2	U	
ETHYLBENZENE	0.8	U	
ISOPROPYLBENZENE	0.94	U	
METHYL ACETATE	1.7	U	
METHYL CYCLOHEXANE	0.32	U	
METHYL TERT-BUTYL ETHER	0.34	U	
METHYLENE CHLORIDE	0.66	U	
STYRENE	0.37	U	
TETRACHLOROETHENE	1	U	
TOLUENE	0.91	U	
TOTAL XYLENES	0.74	U	
TRANS-1,2-DICHLOROETHENE	1.2	U	
TRANS-1,3-DICHLOROPROPENE	0.34	U	
TRICHLOROETHENE	0.9	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1.2	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	0.84	U	
1,1,2,2-TETRACHLOROETHANE	0.4	U	
1,1,2-TRICHLOROETHANE	0.33	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.52	U	
1,1-DICHLOROETHANE	0.5	U	
1,1-DICHLOROETHENE	1.1	U	
1,2,4-TRICHLOROBENZENE	0.17	U	
1,2-DIBROMO-3-CHLOROPROPANE	1.1	U	
1,2-DIBROMOETHANE	0.4	U	
1,2-DICHLOROBENZENE	0.35	U	
1,2-DICHLOROETHANE	0.43	U	
1,2-DICHLOROPROPANE	0.43	U	
1,3-DICHLOROBENZENE	0.79	U	
1,4-DICHLOROBENZENE	0.52	U	
2-BUTANONE	1.3	U	
2-HEXANONE	2.2	U	
4-METHYL-2-PENTANONE	0.54	U	
ACETONE	1.9	U	
BENZENE	0.44	U	
BROMODICHLOROMETHANE	0.28	U	
BROMOFORM	0.94	U	
BROMOMETHANE	0.67	U	
CARBON DISULFIDE	1.2	U	
CARBON TETRACHLORIDE	0.82	U	
CHLOROBENZENE	0.32	U	
CHLORODIBROMOMETHANE	0.32	U	
CHLOROETHANE	1	U	
CHLOROFORM	0.52	U	
CHLOROMETHANE	0.49	U	
CIS-1,2-DICHLOROETHENE	1.1	U	
CIS-1,3-DICHLOROPROPENE	0.47	U	
CYCLOHEXANE	0.5	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OV

nsample 03SB0801
 samp_date 8/16/2007
 lab_id 0708185-02
 qc_type NM
 units UG/KG
 Pct_Solids 84.7
 DUP_OF:

nsample 03SB0901
 samp_date 8/17/2007
 lab_id 0708191-01
 qc_type NM
 units UG/KG
 Pct_Solids 81.4
 DUP_OF:

nsample 03SB0901
 samp_date 8/17/2007
 lab_id 0708191-01
 qc_type NM
 units UG/KG
 Pct_Solids 81.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	1	U	
ETHYLBENZENE	0.7	U	
ISOPROPYLBENZENE	0.82	U	
METHYL ACETATE	1.5	U	
METHYL CYCLOHEXANE	0.28	U	
METHYL TERT-BUTYL ETHER	0.3	U	
METHYLENE CHLORIDE	0.93	U	A
STYRENE	0.33	U	
TETRACHLOROETHENE	0.91	U	
TOLUENE	0.8	U	
TOTAL XYLENES	0.66	U	
TRANS-1,2-DICHLOROETHENE	1	U	
TRANS-1,3-DICHLOROPROPENE	0.3	U	
TRICHLOROETHENE	0.8	U	
TRICHLOROFLUOROMETHANE	0.89	U	
VINYL CHLORIDE	1	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	0.48	U	
1,1,2-TRICHLOROETHANE	0.39	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.61	U	
1,1-DICHLOROETHANE	0.6	U	
1,1-DICHLOROETHENE	1.3	U	
1,2,4-TRICHLOROBENZENE	0.2	U	
1,2-DIBROMO-3-CHLOROPROPANE	1.3	U	
1,2-DIBROMOETHANE	0.48	U	
1,2-DICHLOROBENZENE	0.41	U	
1,2-DICHLOROETHANE	0.51	U	
1,2-DICHLOROPROPANE	0.51	U	
1,3-DICHLOROBENZENE	0.94	U	
1,4-DICHLOROBENZENE	0.61	U	
2-BUTANONE	1.6	U	
2-HEXANONE	2.6	U	
4-METHYL-2-PENTANONE	0.65	U	
ACETONE	2.2	U	
BENZENE	0.52	U	
BROMODICHLOROMETHANE	0.34	U	
BROMOFORM	1.1	U	
BROMOMETHANE	0.8	U	
CARBON DISULFIDE	1.4	U	
CARBON TETRACHLORIDE	0.98	U	
CHLOROBENZENE	0.38	U	
CHLORODIBROMOMETHANE	0.38	U	
CHLOROETHANE	1.2	U	
CHLOROFORM	0.61	U	
CHLOROMETHANE	0.58	U	
CIS-1,2-DICHLOROETHENE	1.3	U	
CIS-1,3-DICHLOROPROPENE	0.56	U	
CYCLOHEXANE	0.6	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	1.2	U	
ETHYLBENZENE	0.84	U	
ISOPROPYLBENZENE	0.98	U	
METHYL ACETATE	1.8	U	
METHYL CYCLOHEXANE	0.34	U	
METHYL TERT-BUTYL ETHER	0.36	U	
METHYLENE CHLORIDE	0.69	U	
STYRENE	0.39	U	
TETRACHLOROETHENE	1.1	U	
TOLUENE	0.96	U	
TOTAL XYLENES	0.78	U	
TRANS-1,2-DICHLOROETHENE	1.2	U	
TRANS-1,3-DICHLOROPROPENE	0.36	U	
TRICHLOROETHENE	0.95	U	
TRICHLOROFLUOROMETHANE	1.1	U	
VINYL CHLORIDE	1.2	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OV

nsample 03SB0901D
 samp_date 8/17/2007
 lab_id 0708191-02
 qc_type NM
 units UG/KG
 Pct_Solids 80.7
 DUP_OF: 03SB0901

nsample 03SB0901D
 samp_date 8/17/2007
 lab_id 0708191-02
 qc_type NM
 units UG/KG
 Pct_Solids 80.7
 DUP_OF: 03SB0901

nsample 03SB1001
 samp_date 8/17/2007
 lab_id 0708191-03
 qc_type NM
 units UG/KG
 Pct_Solids 83.5
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	0.49	U	
1,1,2-TRICHLOROETHANE	0.4	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.63	U	
1,1-DICHLOROETHANE	0.62	U	
1,1-DICHLOROETHENE	1.4	U	
1,2,4-TRICHLOROBENZENE	0.21	U	
1,2-DIBROMO-3-CHLOROPROPANE	1.4	U	
1,2-DIBROMOETHANE	0.49	U	
1,2-DICHLOROBENZENE	0.42	U	
1,2-DICHLOROETHANE	0.53	U	
1,2-DICHLOROPROPANE	0.53	U	
1,3-DICHLOROBENZENE	0.96	U	
1,4-DICHLOROBENZENE	0.63	U	
2-BUTANONE	1.6	U	
2-HEXANONE	2.6	U	
4-METHYL-2-PENTANONE	0.66	U	
ACETONE	2.3	U	
BENZENE	0.54	U	
BROMODICHLOROMETHANE	0.34	U	
BROMOFORM	1.1	U	
BROMOMETHANE	0.83	U	
CARBON DISULFIDE	1.5	U	
CARBON TETRACHLORIDE	1	U	
CHLOROBENZENE	0.39	U	
CHLORODIBROMOMETHANE	0.39	U	
CHLOROETHANE	1.3	U	
CHLOROFORM	0.63	U	
CHLOROMETHANE	0.6	U	
CIS-1,2-DICHLOROETHENE	1.4	U	
CIS-1,3-DICHLOROPROPENE	0.57	U	
CYCLOHEXANE	0.62	U	

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	1.3	U	
ETHYLBENZENE	0.86	U	
ISOPROPYLBENZENE	1	U	
METHYL ACETATE	1.8	U	
METHYL CYCLOHEXANE	0.34	U	
METHYL TERT-BUTYL ETHER	0.37	U	
METHYLENE CHLORIDE	0.71	U	
STYRENE	0.4	U	
TETRACHLOROETHENE	1.1	U	
TOLUENE	0.99	U	
TOTAL XYLENES	0.8	U	
TRANS-1,2-DICHLOROETHENE	1.3	U	
TRANS-1,3-DICHLOROPROPENE	0.37	U	
TRICHLOROETHENE	0.98	U	
TRICHLOROFLUOROMETHANE	1.1	U	
VINYL CHLORIDE	1.3	U	

Parameter	Result	Val Qual	Qual Code
1,1,1-TRICHLOROETHANE	1	U	
1,1,2,2-TETRACHLOROETHANE	0.48	U	
1,1,2-TRICHLOROETHANE	0.39	U	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.61	U	
1,1-DICHLOROETHANE	0.6	U	
1,1-DICHLOROETHENE	1.3	U	
1,2,4-TRICHLOROBENZENE	0.2	U	
1,2-DIBROMO-3-CHLOROPROPANE	1.3	U	
1,2-DIBROMOETHANE	0.48	U	
1,2-DICHLOROBENZENE	0.41	U	
1,2-DICHLOROETHANE	0.51	U	
1,2-DICHLOROPROPANE	0.51	U	
1,3-DICHLOROBENZENE	0.93	U	
1,4-DICHLOROBENZENE	0.61	U	
2-BUTANONE	1.6	U	
2-HEXANONE	2.6	U	
4-METHYL-2-PENTANONE	0.64	U	
ACETONE	2.2	U	
BENZENE	0.52	U	
BROMODICHLOROMETHANE	0.33	U	
BROMOFORM	1.1	U	
BROMOMETHANE	0.8	U	
CARBON DISULFIDE	1.4	U	
CARBON TETRACHLORIDE	0.98	U	
CHLOROBENZENE	0.38	U	
CHLORODIBROMOMETHANE	0.38	U	
CHLOROETHANE	1.2	U	
CHLOROFORM	0.61	U	
CHLOROMETHANE	0.58	U	
CIS-1,2-DICHLOROETHENE	1.3	U	
CIS-1,3-DICHLOROPROPENE	0.55	U	
CYCLOHEXANE	0.6	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OV

nsample 03SB1001
samp_date 8/17/2007
lab_id 0708191-03
qc_type NM
units UG/KG
Pct_Solids 83.5
DUP_OF:

Parameter	Result	Val Qual	Qual Code
DICHLORODIFLUOROMETHANE	1.2	U	
ETHYLBENZENE	0.83	U	
ISOPROPYLBENZENE	0.98	U	
METHYL ACETATE	1.8	U	
METHYL CYCLOHEXANE	0.33	U	
METHYL TERT-BUTYL ETHER	0.35	U	
METHYLENE CHLORIDE	0.69	U	
STYRENE	0.39	U	
TETRACHLOROETHENE	1.1	U	
TOLUENE	0.95	U	
TOTAL XYLENES	0.78	U	
TRANS-1,2-DICHLOROETHENE	1.2	U	
TRANS-1,3-DICHLOROPROPENE	0.35	U	
TRICHLOROETHENE	0.94	U	
TRICHLOROFLUOROMETHANE	1	U	
VINYL CHLORIDE	1.2	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OS

nsample 03SB0101
 samp_date 8/14/2007
 lab_id 0708135-01
 qc_type NM
 units UG/KG
 Pct_Solids 88.6
 DUP_OF:

nsample 03SB0101
 samp_date 8/14/2007
 lab_id 0708135-01
 qc_type NM
 units UG/KG
 Pct_Solids 88.6
 DUP_OF:

nsample 03SB0101
 samp_date 8/14/2007
 lab_id 0708135-01
 qc_type NM
 units UG/KG
 Pct_Solids 88.6
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	33	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	58	U	
2,4,5-TRICHLOROPHENOL	30	U	
2,4,6-TRICHLOROPHENOL	39	U	
2,4-DICHLOROPHENOL	21	U	
2,4-DIMETHYLPHENOL	24	U	
2,4-DINITROPHENOL	150	U	
2,4-DINITROTOLUENE	27	U	
2,6-DINITROTOLUENE	43	U	
2-CHLORONAPHTHALENE	36	U	
2-CHLOROPHENOL	46	U	
2-METHYLNAPHTHALENE	39	U	
2-METHYLPHENOL	44	U	
2-NITROANILINE	36	U	
2-NITROPHENOL	25	U	
3,3'-DICHLOROBENZIDINE	36	U	
3-METHYLPHENOL	31	U	
3-NITROANILINE	53	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	29	U	
4-CHLORO-3-METHYLPHENOL	31	U	
4-CHLOROANILINE	54	U	
4-CHLOROPHENYL PHENYL ETHER	35	U	
4-METHYLPHENOL	30	U	
4-NITROANILINE	110	U	
4-NITROPHENOL	91	U	
ACENAPHTHENE	30	U	
ACENAPHTHYLENE	22	U	
ACETOPHENONE	46	U	
ANTHRACENE	31	U	
ATRAZINE	32	U	
BENZALDEHYDE	63	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)ANTHRACENE	41	U	
BENZO(A)PYRENE	26	U	
BENZO(B)FLUORANTHENE	36	U	
BENZO(G,H,I)PERYLENE	80	U	
BENZO(K)FLUORANTHENE	44	U	
BIS(2-CHLOROETHOXY)METHANE	35	U	
BIS(2-CHLOROETHYL)ETHER	46	U	
BIS(2-ETHYLHEXYL)PHTHALATE	41	U	
BUTYL BENZYL PHTHALATE	34	U	
CAPROLACTAM	76	U	
CARBAZOLE	41	U	
CHRYSENE	35	U	
DIBENZO(A,H)ANTHRACENE	68	U	
DIBENZOFURAN	28	U	
DIETHYL PHTHALATE	750	U	
DIMETHYL PHTHALATE	34	U	
DI-N-BUTYL PHTHALATE	34	U	
DI-N-OCTYL PHTHALATE	30	U	
FLUORANTHENE	60	U	
FLUORENE	29	U	
HEXACHLOROBENZENE	39	U	
HEXACHLOROBUTADIENE	37	U	
HEXACHLOROCYCLOPENTADIENE	69	U	
HEXACHLOROETHANE	44	U	
INDENO(1,2,3-CD)PYRENE	52	U	
ISOPHORONE	32	U	
NAPHTHALENE	36	U	
NITROBENZENE	39	U	
N-NITROSO-DI-N-PROPYLAMINE	62	U	
N-NITROSODIPHENYLAMINE	36	U	
PENTACHLOROPHENOL	38	U	
PHENANTHRENE	26	U	

Parameter	Result	Val Qual	Qual Code
PHENOL	41	U	
PYRENE	45	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OS

nsample 03SB0201
 samp_date 8/14/2007
 lab_id 0708135-02
 qc_type NM
 units UG/KG
 Pct_Solids 85.1
 DUP_OF:

nsample 03SB0201
 samp_date 8/14/2007
 lab_id 0708135-02
 qc_type NM
 units UG/KG
 Pct_Solids 85.1
 DUP_OF:

nsample 03SB0201
 samp_date 8/14/2007
 lab_id 0708135-02
 qc_type NM
 units UG/KG
 Pct_Solids 85.1
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	35	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	60	U	
2,4,5-TRICHLOROPHENOL	31	U	
2,4,6-TRICHLOROPHENOL	41	U	
2,4-DICHLOROPHENOL	22	U	
2,4-DIMETHYLPHENOL	25	U	
2,4-DINITROPHENOL	160	U	
2,4-DINITROTOLUENE	28	U	
2,6-DINITROTOLUENE	44	U	
2-CHLORONAPHTHALENE	38	U	
2-CHLOROPHENOL	48	U	
2-METHYLNAPHTHALENE	41	U	
2-METHYLPHENOL	45	U	
2-NITROANILINE	38	U	
2-NITROPHENOL	26	U	
3,3'-DICHLOROBENZIDINE	37	U	
3-METHYLPHENOL	32	U	
3-NITROANILINE	56	U	
4,6-DINITRO-2-METHYLPHENOL	26	U	
4-BROMOPHENYL PHENYL ETHER	30	U	
4-CHLORO-3-METHYLPHENOL	33	U	
4-CHLOROANILINE	56	U	
4-CHLOROPHENYL PHENYL ETHER	36	U	
4-METHYLPHENOL	31	U	
4-NITROANILINE	120	U	
4-NITROPHENOL	95	U	
ACENAPHTHENE	31	U	
ACENAPHTHYLENE	23	U	
ACETOPHENONE	48	U	
ANTHRACENE	32	U	
ATRAZINE	33	U	
BENZALDEHYDE	65	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)ANTHRACENE	43	U	
BENZO(A)PYRENE	27	U	
BENZO(B)FLUORANTHENE	37	U	
BENZO(G,H,I)PERYLENE	83	U	
BENZO(K)FLUORANTHENE	46	U	
BIS(2-CHLOROETHOXY)METHANE	36	U	
BIS(2-CHLOROETHYL)ETHER	48	U	
BIS(2-ETHYLHEXYL)PHTHALATE	42	U	
BUTYL BENZYL PHTHALATE	35	U	
CAPROLACTAM	79	U	
CARBAZOLE	42	U	
CHRYSENE	46	J	P
DIBENZO(A,H)ANTHRACENE	71	U	
DIBENZOFURAN	29	U	
DIETHYL PHTHALATE	780	U	
DIMETHYL PHTHALATE	36	U	
DI-N-BUTYL PHTHALATE	36	U	
DI-N-OCTYL PHTHALATE	32	U	
FLUORANTHENE	63	U	
FLUORENE	31	U	
HEXACHLOROBENZENE	41	U	
HEXACHLOROBUTADIENE	38	U	
HEXACHLOROCYCLOPENTADIENE	72	U	
HEXACHLOROETHANE	46	U	
INDENO(1,2,3-CD)PYRENE	54	U	
ISOPHORONE	33	U	
NAPHTHALENE	38	U	
NITROBENZENE	41	U	
N-NITROSO-DI-N-PROPYLAMINE	64	U	
N-NITROSODIPHENYLAMINE	38	U	
PENTACHLOROPHENOL	40	U	
PHENANTHRENE	27	U	

Parameter	Result	Val Qual	Qual Code
PHENOL	42	U	
PYRENE	47	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OS

nsample 03SB0301
 samp_date 8/15/2007
 lab_id 0708160-01
 qc_type NM
 units UG/KG
 Pct_Solids 85.4
 DUP_OF:

nsample 03SB0301
 samp_date 8/15/2007
 lab_id 0708160-01
 qc_type NM
 units UG/KG
 Pct_Solids 85.4
 DUP_OF:

nsample 03SB0301
 samp_date 8/15/2007
 lab_id 0708160-01
 qc_type NM
 units UG/KG
 Pct_Solids 85.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	34	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	60	U	
2,4,5-TRICHLOROPHENOL	31	U	
2,4,6-TRICHLOROPHENOL	41	U	
2,4-DICHLOROPHENOL	22	U	
2,4-DIMETHYLPHENOL	25	U	
2,4-DINITROPHENOL	160	U	
2,4-DINITROTOLUENE	28	U	
2,6-DINITROTOLUENE	44	U	
2-CHLORONAPHTHALENE	37	U	
2-CHLOROPHENOL	48	U	
2-METHYLNAPHTHALENE	41	U	
2-METHYLPHENOL	45	U	
2-NITROANILINE	38	U	
2-NITROPHENOL	26	U	
3,3'-DICHLOROBENZIDINE	37	U	
3-METHYLPHENOL	32	U	
3-NITROANILINE	55	U	
4,6-DINITRO-2-METHYLPHENOL	26	U	
4-BROMOPHENYL PHENYL ETHER	30	U	
4-CHLORO-3-METHYLPHENOL	32	U	
4-CHLOROANILINE	56	U	
4-CHLOROPHENYL PHENYL ETHER	36	U	
4-METHYLPHENOL	31	U	
4-NITROANILINE	120	U	
4-NITROPHENOL	95	U	
ACENAPHTHENE	31	U	
ACENAPHTHYLENE	23	U	
ACETOPHENONE	48	U	
ANTHRACENE	32	U	
ATRAZINE	33	U	
BENZALDEHYDE	65	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)ANTHRACENE	42	U	
BENZO(A)PYRENE	27	U	
BENZO(B)FLUORANTHENE	37	U	
BENZO(G,H,I)PERYLENE	83	U	
BENZO(K)FLUORANTHENE	46	U	
BIS(2-CHLOROETHOXY)METHANE	36	U	
BIS(2-CHLOROETHYL)ETHER	48	U	
BIS(2-ETHYLHEXYL)PHTHALATE	42	U	
BUTYL BENZYL PHTHALATE	35	U	
CAPROLACTAM	79	U	
CARBAZOLE	42	U	
CHRYSENE	36	U	
DIBENZO(A,H)ANTHRACENE	70	U	
DIBENZOFURAN	29	U	
DIETHYL PHTHALATE	40	U	
DIMETHYL PHTHALATE	36	U	
DI-N-BUTYL PHTHALATE	36	U	
DI-N-OCTYL PHTHALATE	32	U	
FLUORANTHENE	63	U	
FLUORENE	31	U	
HEXACHLOROBENZENE	41	U	
HEXACHLOROBUTADIENE	38	U	
HEXACHLOROCYCLOPENTADIENE	72	U	
HEXACHLOROETHANE	46	U	
INDENO(1,2,3-CD)PYRENE	54	U	
ISOPHORONE	33	U	
NAPHTHALENE	38	U	
NITROBENZENE	40	U	
N-NITROSO-DI-N-PROPYLAMINE	64	U	
N-NITROSODIPHENYLAMINE	37	U	
PENTACHLOROPHENOL	40	U	
PHENANTHRENE	27	U	

Parameter	Result	Val Qual	Qual Code
PHENOL	42	U	
PYRENE	46	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OS

nsample 03SB0401
 samp_date 8/15/2007
 lab_id 0708160-02
 qc_type NM
 units UG/KG
 Pct_Solids 80.7
 DUP_OF:

nsample 03SB0401
 samp_date 8/15/2007
 lab_id 0708160-02
 qc_type NM
 units UG/KG
 Pct_Solids 80.7
 DUP_OF:

nsample 03SB0401
 samp_date 8/15/2007
 lab_id 0708160-02
 qc_type NM
 units UG/KG
 Pct_Solids 80.7
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	36	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	63	U	
2,4,5-TRICHLOROPHENOL	33	U	
2,4,6-TRICHLOROPHENOL	43	U	
2,4-DICHLOROPHENOL	23	U	
2,4-DIMETHYLPHENOL	26	U	
2,4-DINITROPHENOL	160	U	
2,4-DINITROTOLUENE	29	U	
2,6-DINITROTOLUENE	46	U	
2-CHLORONAPHTHALENE	39	U	
2-CHLOROPHENOL	50	U	
2-METHYLNAPHTHALENE	43	U	
2-METHYLPHENOL	47	U	
2-NITROANILINE	39	U	
2-NITROPHENOL	27	U	
3,3'-DICHLORO BENZIDINE	38	U	
3-METHYLPHENOL	33	U	
3-NITROANILINE	58	U	
4,6-DINITRO-2-METHYLPHENOL	27	U	
4-BROMOPHENYL PHENYL ETHER	32	U	
4-CHLORO-3-METHYLPHENOL	34	U	
4-CHLOROANILINE	58	U	
4-CHLOROPHENYL PHENYL ETHER	38	U	
4-METHYLPHENOL	32	U	
4-NITROANILINE	120	U	
4-NITROPHENOL	99	U	
ACENAPHTHENE	32	U	
ACENAPHTHYLENE	24	U	
ACETOPHENONE	50	U	
ANTHRACENE	33	U	
ATRAZINE	35	U	
BENZALDEHYDE	68	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)ANTHRACENE	44	U	
BENZO(A)PYRENE	28	U	
BENZO(B)FLUORANTHENE	38	U	
BENZO(G,H,I)PERYLENE	86	U	
BENZO(K)FLUORANTHENE	48	U	
BIS(2-CHLOROETHOXY)METHANE	38	U	
BIS(2-CHLOROETHYL)ETHER	50	U	
BIS(2-ETHYLHEXYL)PHTHALATE	44	U	
BUTYL BENZYL PHTHALATE	36	U	
CAPROLACTAM	82	U	
CARBAZOLE	44	U	
CHRYSENE	38	U	
DIBENZO(A,H)ANTHRACENE	74	U	
DIBENZOFURAN	30	U	
DIETHYL PHTHALATE	41	U	
DIMETHYL PHTHALATE	37	U	
DI-N-BUTYL PHTHALATE	37	U	
DI-N-OCTYL PHTHALATE	33	U	
FLUORANTHENE	65	U	
FLUORENE	32	U	
HEXACHLOROBENZENE	42	U	
HEXACHLOROBUTADIENE	40	U	
HEXACHLOROCYCLOPENTADIENE	75	U	
HEXACHLOROETHANE	48	U	
INDENO(1,2,3-CD)PYRENE	56	U	
ISOPHORONE	35	U	
NAPHTHALENE	40	U	
NITROBENZENE	42	U	
N-NITROSO-DI-N-PROPYLAMINE	67	U	
N-NITROSODIPHENYLAMINE	39	U	
PENTACHLOROPHENOL	41	U	
PHENANTHRENE	28	U	

Parameter	Result	Val Qual	Qual Code
PHENOL	44	U	
PYRENE	49	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OS

nsample 03SB0501
 samp_date 8/15/2007
 lab_id 0708160-03
 qc_type NM
 units UG/KG
 Pct_Solids 81.1
 DUP_OF:

nsample 03SB0501
 samp_date 8/15/2007
 lab_id 0708160-03
 qc_type NM
 units UG/KG
 Pct_Solids 81.1
 DUP_OF:

nsample 03SB0501
 samp_date 8/15/2007
 lab_id 0708160-03
 qc_type NM
 units UG/KG
 Pct_Solids 81.1
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	36	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	62	U	
2,4,5-TRICHLOROPHENOL	32	U	
2,4,6-TRICHLOROPHENOL	42	U	
2,4-DICHLOROPHENOL	23	U	
2,4-DIMETHYLPHENOL	26	U	
2,4-DINITROPHENOL	160	U	
2,4-DINITROTOLUENE	29	U	
2,6-DINITROTOLUENE	46	U	
2-CHLORONAPHTHALENE	39	U	
2-CHLOROPHENOL	49	U	
2-METHYLNAPHTHALENE	42	U	
2-METHYLPHENOL	47	U	
2-NITROANILINE	39	U	
2-NITROPHENOL	27	U	
3,3'-DICHLOROBENZIDINE	38	U	
3-METHYLPHENOL	33	U	
3-NITROANILINE	57	U	
4,6-DINITRO-2-METHYLPHENOL	26	U	
4-BROMOPHENYL PHENYL ETHER	31	U	
4-CHLORO-3-METHYLPHENOL	34	U	
4-CHLOROANILINE	58	U	
4-CHLOROPHENYL PHENYL ETHER	37	U	
4-METHYLPHENOL	32	U	
4-NITROANILINE	120	U	
4-NITROPHENOL	98	U	
ACENAPHTHENE	32	U	
ACENAPHTHYLENE	24	U	
ACETOPHENONE	50	U	
ANTHRACENE	33	U	
ATRAZINE	34	U	
BENZALDEHYDE	67	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)ANTHRACENE	44	U	
BENZO(A)PYRENE	28	U	
BENZO(B)FLUORANTHENE	38	U	
BENZO(G,H,I)PERYLENE	85	U	
BENZO(K)FLUORANTHENE	48	U	
BIS(2-CHLOROETHOXY)METHANE	37	U	
BIS(2-CHLOROETHYL)ETHER	49	U	
BIS(2-ETHYLHEXYL)PHTHALATE	44	U	
BUTYL BENZYL PHTHALATE	36	U	
CAPROLACTAM	81	U	
CARBAZOLE	44	U	
CHRYSENE	37	U	
DIBENZO(A,H)ANTHRACENE	73	U	
DIBENZOFURAN	30	U	
DIETHYL PHTHALATE	41	U	
DIMETHYL PHTHALATE	37	U	
DI-N-BUTYL PHTHALATE	37	U	
DI-N-OCTYL PHTHALATE	32	U	
FLUORANTHENE	65	U	
FLUORENE	32	U	
HEXACHLOROBENZENE	42	U	
HEXACHLOROBUTADIENE	40	U	
HEXACHLOROCYCLOPENTADIENE	74	U	
HEXACHLOROETHANE	48	U	
INDENO(1,2,3-CD)PYRENE	56	U	
ISOPHORONE	34	U	
NAPHTHALENE	39	U	
NITROBENZENE	42	U	
N-NITROSO-DI-N-PROPYLAMINE	66	U	
N-NITROSODIPHENYLAMINE	39	U	
PENTACHLOROPHENOL	41	U	
PHENANTHRENE	28	U	

Parameter	Result	Val Qual	Qual Code
PHENOL	44	U	
PYRENE	48	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OS

nsample 03SB0601
 samp_date 8/16/2007
 lab_id 0708185-01
 qc_type NM
 units UG/KG
 Pct_Solids 83.1
 DUP_OF:

nsample 03SB0601
 samp_date 8/16/2007
 lab_id 0708185-01
 qc_type NM
 units UG/KG
 Pct_Solids 83.1
 DUP_OF:

nsample 03SB0601
 samp_date 8/16/2007
 lab_id 0708185-01
 qc_type NM
 units UG/KG
 Pct_Solids 83.1
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	35	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	62	U	
2,4,5-TRICHLOROPHENOL	32	U	
2,4,6-TRICHLOROPHENOL	42	U	
2,4-DICHLOROPHENOL	23	U	
2,4-DIMETHYLPHENOL	26	U	
2,4-DINITROPHENOL	160	U	
2,4-DINITROTOLUENE	29	U	
2,6-DINITROTOLUENE	46	U	
2-CHLORONAPHTHALENE	38	U	
2-CHLOROPHENOL	49	U	
2-METHYLNAPHTHALENE	42	U	
2-METHYLPHENOL	46	U	
2-NITROANILINE	39	U	
2-NITROPHENOL	26	U	
3,3'-DICHLOROBENZIDINE	38	U	
3-METHYLPHENOL	33	U	
3-NITROANILINE	57	U	
4,6-DINITRO-2-METHYLPHENOL	26	U	
4-BROMOPHENYL PHENYL ETHER	31	U	
4-CHLORO-3-METHYLPHENOL	33	U	
4-CHLOROANILINE	58	U	
4-CHLOROPHENYL PHENYL ETHER	37	U	
4-METHYLPHENOL	32	U	
4-NITROANILINE	120	U	
4-NITROPHENOL	97	U	
ACENAPHTHENE	32	U	
ACENAPHTHYLENE	24	U	
ACETOPHENONE	49	U	
ANTHRACENE	33	U	
ATRAZINE	34	U	
BENZALDEHYDE	67	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)ANTHRACENE	44	U	
BENZO(A)PYRENE	28	U	
BENZO(B)FLUORANTHENE	38	U	
BENZO(G,H,I)PERYLENE	85	U	
BENZO(K)FLUORANTHENE	47	U	
BIS(2-CHLOROETHOXY)METHANE	37	U	
BIS(2-CHLOROETHYL)ETHER	49	U	
BIS(2-ETHYLHEXYL)PHTHALATE	43	U	
BUTYL BENZYL PHTHALATE	36	U	
CAPROLACTAM	81	U	
CARBAZOLE	44	U	
CHRYSENE	37	U	
DIBENZO(A,H)ANTHRACENE	72	U	
DIBENZOFURAN	29	U	
DIETHYL PHTHALATE	41	U	
DIMETHYL PHTHALATE	37	U	
DI-N-BUTYL PHTHALATE	36	U	
DI-N-OCTYL PHTHALATE	32	U	
FLUORANTHENE	64	U	
FLUORENE	31	U	
HEXACHLOROBENZENE	42	U	
HEXACHLOROBUTADIENE	39	U	
HEXACHLOROCYCLOPENTADIENE	74	U	
HEXACHLOROETHANE	47	U	
INDENO(1,2,3-CD)PYRENE	55	U	
ISOPHORONE	34	U	
NAPHTHALENE	39	U	
NITROBENZENE	42	U	
N-NITROSO-DI-N-PROPYLAMINE	66	U	
N-NITROSODIPHENYLAMINE	38	U	
PENTACHLOROPHENOL	41	U	
PHENANTHRENE	27	U	

Parameter	Result	Val Qual	Qual Code
PHENOL	43	U	
PYRENE	48	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OS

nsample 03SB0701
 samp_date 8/16/2007
 lab_id 0708185-03
 qc_type NM
 units UG/KG
 Pct_Solids 87.1
 DUP_OF:

nsample 03SB0701
 samp_date 8/16/2007
 lab_id 0708185-03
 qc_type NM
 units UG/KG
 Pct_Solids 87.1
 DUP_OF:

nsample 03SB0701
 samp_date 8/16/2007
 lab_id 0708185-03
 qc_type NM
 units UG/KG
 Pct_Solids 87.1
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	34	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	59	U	
2,4,5-TRICHLOROPHENOL	31	U	
2,4,6-TRICHLOROPHENOL	40	U	
2,4-DICHLOROPHENOL	22	U	
2,4-DIMETHYLPHENOL	24	U	
2,4-DINITROPHENOL	150	U	
2,4-DINITROTOLUENE	28	U	
2,6-DINITROTOLUENE	43	U	
2-CHLORONAPHTHALENE	37	U	
2-CHLOROPHENOL	47	U	
2-METHYLNAPHTHALENE	40	U	
2-METHYLPHENOL	44	U	
2-NITROANILINE	37	U	
2-NITROPHENOL	25	U	
3,3'-DICHLORO BENZIDINE	36	U	
3-METHYLPHENOL	31	U	
3-NITROANILINE	54	U	
4,6-DINITRO-2-METHYLPHENOL	25	U	
4-BROMOPHENYL PHENYL ETHER	30	U	
4-CHLORO-3-METHYLPHENOL	32	U	
4-CHLOROANILINE	55	U	
4-CHLOROPHENYL PHENYL ETHER	35	U	
4-METHYLPHENOL	30	U	
4-NITROANILINE	120	U	
4-NITROPHENOL	93	U	
ACENAPHTHENE	30	U	
ACENAPHTHYLENE	22	U	
ACETOPHENONE	47	U	
ANTHRACENE	31	U	
ATRAZINE	32	U	
BENZALDEHYDE	64	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)ANTHRACENE	42	U	
BENZO(A)PYRENE	26	U	
BENZO(B)FLUORANTHENE	36	U	
BENZO(G,H,I)PERYLENE	81	U	
BENZO(K)FLUORANTHENE	45	U	
BIS(2-CHLOROETHOXY)METHANE	36	U	
BIS(2-CHLOROETHYL)ETHER	47	U	
BIS(2-ETHYLHEXYL)PHTHALATE	480		
BUTYL BENZYL PHTHALATE	34	U	
CAPROLACTAM	77	U	
CARBAZOLE	42	U	
CHRYSENE	36	U	
DIBENZO(A,H)ANTHRACENE	69	U	
DIBENZOFURAN	28	U	
DIETHYL PHTHALATE	39	U	
DIMETHYL PHTHALATE	35	U	
DI-N-BUTYL PHTHALATE	35	U	
DI-N-OCTYL PHTHALATE	31	U	
FLUORANTHENE	61	U	
FLUORENE	30	U	
HEXACHLORO BENZENE	40	U	
HEXACHLOROBUTADIENE	38	U	
HEXACHLOROCYCLOPENTADIENE	70	U	
HEXACHLOROETHANE	45	U	
INDENO(1,2,3-CD)PYRENE	53	U	
ISOPHORONE	32	U	
NAPHTHALENE	37	U	
NITROBENZENE	40	U	
N-NITROSO-DI-N-PROPYLAMINE	63	U	
N-NITROSODIPHENYLAMINE	37	U	
PENTACHLOROPHENOL	39	U	
PHENANTHRENE	26	U	

Parameter	Result	Val Qual	Qual Code
PHENOL	41	U	
PYRENE	46	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OS

nsample 03SB0801
 samp_date 8/16/2007
 lab_id 0708185-02
 qc_type NM
 units UG/KG
 Pct_Solids 84.7
 DUP_OF:

nsample 03SB0801
 samp_date 8/16/2007
 lab_id 0708185-02
 qc_type NM
 units UG/KG
 Pct_Solids 84.7
 DUP_OF:

nsample 03SB0801
 samp_date 8/16/2007
 lab_id 0708185-02
 qc_type NM
 units UG/KG
 Pct_Solids 84.7
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	35	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	60	U	
2,4,5-TRICHLOROPHENOL	32	U	
2,4,6-TRICHLOROPHENOL	41	U	
2,4-DICHLOROPHENOL	22	U	
2,4-DIMETHYLPHENOL	25	U	
2,4-DINITROPHENOL	160	U	
2,4-DINITROTOLUENE	28	U	
2,6-DINITROTOLUENE	45	U	
2-CHLORONAPHTHALENE	38	U	
2-CHLOROPHENOL	48	U	
2-METHYLNAPHTHALENE	41	U	
2-METHYLPHENOL	46	U	
2-NITROANILINE	38	U	
2-NITROPHENOL	26	U	
3,3'-DICHLOROBENZIDINE	37	U	
3-METHYLPHENOL	32	U	
3-NITROANILINE	56	U	
4,6-DINITRO-2-METHYLPHENOL	26	U	
4-BROMOPHENYL PHENYL ETHER	30	U	
4-CHLORO-3-METHYLPHENOL	33	U	
4-CHLOROANILINE	56	U	
4-CHLOROPHENYL PHENYL ETHER	36	U	
4-METHYLPHENOL	31	U	
4-NITROANILINE	120	U	
4-NITROPHENOL	96	U	
ACENAPHTHENE	31	U	
ACENAPHTHYLENE	23	U	
ACETOPHENONE	48	U	
ANTHRACENE	32	U	
ATRAZINE	34	U	
BENZALDEHYDE	65	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)ANTHRACENE	43	U	
BENZO(A)PYRENE	27	U	
BENZO(B)FLUORANTHENE	37	U	
BENZO(G,H,I)PERYLENE	83	U	
BENZO(K)FLUORANTHENE	46	U	
BIS(2-CHLOROETHOXY)METHANE	36	U	
BIS(2-CHLOROETHYL)ETHER	48	U	
BIS(2-ETHYLHEXYL)PHTHALATE	43	U	
BUTYL BENZYL PHTHALATE	35	U	
CAPROLACTAM	80	U	
CARBAZOLE	43	U	
CHRYSENE	36	U	
DIBENZO(A,H)ANTHRACENE	71	U	
DIBENZOFURAN	29	U	
DIETHYL PHTHALATE	40	U	
DIMETHYL PHTHALATE	36	U	
DI-N-BUTYL PHTHALATE	36	U	
DI-N-OCTYL PHTHALATE	32	U	
FLUORANTHENE	63	U	
FLUORENE	31	U	
HEXACHLOROBENZENE	41	U	
HEXACHLOROBUTADIENE	39	U	
HEXACHLOROCYCLOPENTADIENE	72	U	
HEXACHLOROETHANE	46	U	
INDENO(1,2,3-CD)PYRENE	54	U	
ISOPHORONE	33	U	
NAPHTHALENE	38	U	
NITROBENZENE	41	U	
N-NITROSO-DI-N-PROPYLAMINE	65	U	
N-NITROSODIPHENYLAMINE	38	U	
PENTACHLOROPHENOL	40	U	
PHENANTHRENE	27	U	

Parameter	Result	Val Qual	Qual Code
PHENOL	42	U	
PYRENE	47	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OS

nsample 03SB0901
 samp_date 8/17/2007
 lab_id 0708191-01
 qc_type NM
 units UG/KG
 Pct_Solids 81.4
 DUP_OF:

nsample 03SB0901
 samp_date 8/17/2007
 lab_id 0708191-01
 qc_type NM
 units UG/KG
 Pct_Solids 81.4
 DUP_OF:

nsample 03SB0901
 samp_date 8/17/2007
 lab_id 0708191-01
 qc_type NM
 units UG/KG
 Pct_Solids 81.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	36	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	63	U	
2,4,5-TRICHLOROPHENOL	33	U	
2,4,6-TRICHLOROPHENOL	43	U	
2,4-DICHLOROPHENOL	23	U	
2,4-DIMETHYLPHENOL	26	U	
2,4-DINITROPHENOL	160	U	
2,4-DINITROTOLUENE	30	U	
2,6-DINITROTOLUENE	46	U	
2-CHLORONAPHTHALENE	39	U	
2-CHLOROPHENOL	50	U	
2-METHYLNAPHTHALENE	43	U	
2-METHYLPHENOL	47	U	
2-NITROANILINE	39	U	
2-NITROPHENOL	27	U	
3,3'-DICHLOROBENZIDINE	39	U	
3-METHYLPHENOL	33	U	
3-NITROANILINE	58	U	
4,6-DINITRO-2-METHYLPHENOL	27	U	
4-BROMOPHENYL PHENYL ETHER	32	U	
4-CHLORO-3-METHYLPHENOL	34	U	
4-CHLOROANILINE	59	U	
4-CHLOROPHENYL PHENYL ETHER	38	U	
4-METHYLPHENOL	32	U	
4-NITROANILINE	120	U	
4-NITROPHENOL	99	U	
ACENAPHTHENE	32	U	
ACENAPHTHYLENE	24	U	
ACETOPHENONE	50	U	
ANTHRACENE	33	U	
ATRAZINE	35	U	
BENZALDEHYDE	68	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)ANTHRACENE	45	U	
BENZO(A)PYRENE	28	U	
BENZO(B)FLUORANTHENE	39	U	
BENZO(G,H,I)PERYLENE	87	U	
BENZO(K)FLUORANTHENE	48	U	
BIS(2-CHLOROETHOXY)METHANE	38	U	
BIS(2-CHLOROETHYL)ETHER	50	U	
BIS(2-ETHYLHEXYL)PHTHALATE	44	U	
BUTYL BENZYL PHTHALATE	36	U	
CAPROLACTAM	83	U	
CARBAZOLE	44	U	
CHRYSENE	38	U	
DIBENZO(A,H)ANTHRACENE	74	U	
DIBENZOFURAN	30	U	
DIETHYL PHTHALATE	42	U	
DIMETHYL PHTHALATE	37	U	
DI-N-BUTYL PHTHALATE	37	U	
DI-N-OCTYL PHTHALATE	33	U	
FLUORANTHENE	66	U	
FLUORENE	32	U	
HEXACHLOROBENZENE	43	U	
HEXACHLOROBUTADIENE	40	U	
HEXACHLOROCYCLOPENTADIENE	75	U	
HEXACHLOROETHANE	48	U	
INDENO(1,2,3-CD)PYRENE	57	U	
ISOPHORONE	35	U	
NAPHTHALENE	40	U	
NITROBENZENE	42	U	
N-NITROSO-DI-N-PROPYLAMINE	67	U	
N-NITROSODIPHENYLAMINE	39	U	
PENTACHLOROPHENOL	41	U	
PHENANTHRENE	28	U	

Parameter	Result	Val Qual	Qual Code
PHENOL	44	U	
PYRENE	49	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OS

nsample 03SB0901D
 samp_date 8/17/2007
 lab_id 0708191-02
 qc_type NM
 units UG/KG
 Pct_Solids 80.7
 DUP_OF: 03SB0901

nsample 03SB0901D
 samp_date 8/17/2007
 lab_id 0708191-02
 qc_type NM
 units UG/KG
 Pct_Solids 80.7
 DUP_OF: 03SB0901

nsample 03SB0901D
 samp_date 8/17/2007
 lab_id 0708191-02
 qc_type NM
 units UG/KG
 Pct_Solids 80.7
 DUP_OF: 03SB0901

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	36	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	64	U	
2,4,5-TRICHLOROPHENOL	33	U	
2,4,6-TRICHLOROPHENOL	43	U	
2,4-DICHLOROPHENOL	23	U	
2,4-DIMETHYLPHENOL	26	U	
2,4-DINITROPHENOL	160	U	
2,4-DINITROTOLUENE	30	U	
2,6-DINITROTOLUENE	47	U	
2-CHLORONAPHTHALENE	40	U	
2-CHLOROPHENOL	50	U	
2-METHYLNAPHTHALENE	43	U	
2-METHYLPHENOL	48	U	
2-NITROANILINE	40	U	
2-NITROPHENOL	27	U	
3,3'-DICHLORO BENZIDINE	39	U	
3-METHYLPHENOL	34	U	
3-NITROANILINE	58	U	
4,6-DINITRO-2-METHYLPHENOL	27	U	
4-BROMOPHENYL PHENYL ETHER	32	U	
4-CHLORO-3-METHYLPHENOL	34	U	
4-CHLOROANILINE	59	U	
4-CHLOROPHENYL PHENYL ETHER	38	U	
4-METHYLPHENOL	33	U	
4-NITROANILINE	120	U	
4-NITROPHENOL	100	U	
ACENAPHTHENE	33	U	
ACENAPHTHYLENE	24	U	
ACETOPHENONE	51	U	
ANTHRACENE	34	U	
ATRAZINE	35	U	
BENZALDEHYDE	69	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)ANTHRACENE	45	U	
BENZO(A)PYRENE	28	U	
BENZO(B)FLUORANTHENE	39	U	
BENZO(G,H,I)PERYLENE	87	U	
BENZO(K)FLUORANTHENE	49	U	
BIS(2-CHLOROETHOXY)METHANE	38	U	
BIS(2-CHLOROETHYL)ETHER	50	U	
BIS(2-ETHYLHEXYL)PHTHALATE	45	U	
BUTYL BENZYL PHTHALATE	37	U	
CAPROLACTAM	83	U	
CARBAZOLE	45	U	
CHRYSENE	38	U	
DIBENZO(A,H)ANTHRACENE	74	U	
DIBENZOFURAN	30	U	
DIETHYL PHTHALATE	42	U	
DIMETHYL PHTHALATE	38	U	
DI-N-BUTYL PHTHALATE	38	U	
DI-N-OCTYL PHTHALATE	33	U	
FLUORANTHENE	66	U	
FLUORENE	32	U	
HEXACHLORO BENZENE	43	U	
HEXACHLOROBUTADIENE	41	U	
HEXACHLOROCYCLOPENTADIENE	76	U	
HEXACHLOROETHANE	49	U	
INDENO(1,2,3-CD)PYRENE	57	U	
ISOPHORONE	35	U	
NAPHTHALENE	40	U	
NITROBENZENE	43	U	
N-NITROSO-DI-N-PROPYLAMINE	68	U	
N-NITROSODIPHENYLAMINE	40	U	
PENTACHLOROPHENOL	42	U	
PHENANTHRENE	28	U	

Parameter	Result	Val Qual	Qual Code
PHENOL	45	U	
PYRENE	49	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: OS

nsample 03SB1001
 samp_date 8/17/2007
 lab_id 0708191-03
 qc_type NM
 units UG/KG
 Pct_Solids 83.5
 DUP_OF:

nsample 03SB1001
 samp_date 8/17/2007
 lab_id 0708191-03
 qc_type NM
 units UG/KG
 Pct_Solids 83.5
 DUP_OF:

nsample 03SB1001
 samp_date 8/17/2007
 lab_id 0708191-03
 qc_type NM
 units UG/KG
 Pct_Solids 83.5
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
1,1-BIPHENYL	35	U	
2,2'-OXYBIS(1-CHLOROPROPANE)	61	U	
2,4,5-TRICHLOROPHENOL	32	U	
2,4,6-TRICHLOROPHENOL	42	U	
2,4-DICHLOROPHENOL	22	U	
2,4-DIMETHYLPHENOL	26	U	
2,4-DINITROPHENOL	160	U	
2,4-DINITROTOLUENE	29	U	
2,6-DINITROTOLUENE	45	U	
2-CHLORONAPHTHALENE	38	U	
2-CHLOROPHENOL	49	U	
2-METHYLNAPHTHALENE	42	U	
2-METHYLPHENOL	46	U	
2-NITROANILINE	38	U	
2-NITROPHENOL	26	U	
3,3'-DICHLOROBENZIDINE	38	U	
3-METHYLPHENOL	32	U	
3-NITROANILINE	56	U	
4,6-DINITRO-2-METHYLPHENOL	26	U	
4-BROMOPHENYL PHENYL ETHER	31	U	
4-CHLORO-3-METHYLPHENOL	33	U	
4-CHLOROANILINE	57	U	
4-CHLOROPHENYL PHENYL ETHER	37	U	
4-METHYLPHENOL	32	U	
4-NITROANILINE	120	U	
4-NITROPHENOL	97	U	
ACENAPHTHENE	32	U	
ACENAPHTHYLENE	23	U	
ACETOPHENONE	49	U	
ANTHRACENE	33	U	
ATRAZINE	34	U	
BENZALDEHYDE	66	U	

Parameter	Result	Val Qual	Qual Code
BENZO(A)ANTHRACENE	44	U	
BENZO(A)PYRENE	27	U	
BENZO(B)FLUORANTHENE	38	U	
BENZO(G,H,I)PERYLENE	84	U	
BENZO(K)FLUORANTHENE	47	U	
BIS(2-CHLOROETHOXY)METHANE	37	U	
BIS(2-CHLOROETHYL)ETHER	49	U	
BIS(2-ETHYLHEXYL)PHTHALATE	43	U	
BUTYL BENZYL PHTHALATE	36	U	
CAPROLACTAM	81	U	
CARBAZOLE	43	U	
CHRYSENE	37	U	
DIBENZO(A,H)ANTHRACENE	72	U	
DIBENZOFURAN	29	U	
DIETHYL PHTHALATE	41	U	
DIMETHYL PHTHALATE	36	U	
DI-N-BUTYL PHTHALATE	36	U	
DI-N-OCTYL PHTHALATE	32	U	
FLUORANTHENE	64	U	
FLUORENE	31	U	
HEXACHLORO BENZENE	42	U	
HEXACHLOROBUTADIENE	39	U	
HEXACHLOROCYCLOPENTADIENE	73	U	
HEXACHLOROETHANE	47	U	
INDENO(1,2,3-CD)PYRENE	55	U	
ISOPHORONE	34	U	
NAPHTHALENE	39	U	
NITROBENZENE	41	U	
N-NITROSO-DI-N-PROPYLAMINE	66	U	
N-NITROSODIPHENYLAMINE	38	U	
PENTACHLOROPHENOL	40	U	
PHENANTHRENE	27	U	

Parameter	Result	Val Qual	Qual Code
PHENOL	43	U	
PYRENE	48	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 03SB0101
 samp_date 8/14/2007
 lab_id 0708135-01
 qc_type NM
 units UG/KG
 Pct_Solids 88.6
 DUP_OF:

nsample 03SB0201
 samp_date 8/14/2007
 lab_id 0708135-02
 qc_type NM
 units UG/KG
 Pct_Solids 85.1
 DUP_OF:

nsample 03SB0301
 samp_date 8/15/2007
 lab_id 0708160-01
 qc_type NM
 units UG/KG
 Pct_Solids 85.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.15	U	
4,4'-DDE	0.15	U	
4,4'-DDT	1.7	J	C
ALDRIN	0.097	U	
ALPHA-BHC	0.097	U	
ALPHA-CHLORDANE	0.097	U	
AROCLOR-1016	3.7	U	
AROCLOR-1221	3.7	U	
AROCLOR-1232	3.7	U	
AROCLOR-1242	3.7	U	
AROCLOR-1248	3.7	U	
AROCLOR-1254	3.7	U	
AROCLOR-1260	3.7	U	
BETA-BHC	0.43		
DELTA-BHC	0.097	U	
DIELDRIN	0.15	U	
ENDOSULFAN I	0.097	U	
ENDOSULFAN II	0.15	U	
ENDOSULFAN SULFATE	0.15	U	
ENDRIN	0.15	U	
ENDRIN ALDEHYDE	0.15	U	
ENDRIN KETONE	0.15	U	
GAMMA-BHC (LINDANE)	0.097	U	
GAMMA-CHLORDANE	0.49		
HEPTACHLOR	0.097	U	
HEPTACHLOR EPOXIDE	0.69		
METHOXYCHLOR	0.097	U	
TOXAPHENE	9.7	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	1		
4,4'-DDE	0.34	J	CP
4,4'-DDT	0.15	U	
ALDRIN	0.1	U	
ALPHA-BHC	0.1	U	
ALPHA-CHLORDANE	0.1	U	
AROCLOR-1016	3.8	U	
AROCLOR-1221	3.8	U	
AROCLOR-1232	3.8	U	
AROCLOR-1242	3.8	U	
AROCLOR-1248	3.8	U	
AROCLOR-1254	3.8	U	
AROCLOR-1260	3.8	U	
BETA-BHC	0.35		
DELTA-BHC	0.1	U	
DIELDRIN	0.15	U	
ENDOSULFAN I	0.1	U	
ENDOSULFAN II	0.15	U	
ENDOSULFAN SULFATE	0.15	U	
ENDRIN	0.15	U	
ENDRIN ALDEHYDE	0.15	U	
ENDRIN KETONE	0.15	U	
GAMMA-BHC (LINDANE)	0.41		
GAMMA-CHLORDANE	0.1	U	
HEPTACHLOR	0.1	U	
HEPTACHLOR EPOXIDE	0.23	J	P
METHOXYCHLOR	0.1	U	
TOXAPHENE	10	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	1.2		
4,4'-DDE	0.53	J	CP
4,4'-DDT	0.79		
ALDRIN	0.1	U	
ALPHA-BHC	0.1	U	
ALPHA-CHLORDANE	0.1	U	
AROCLOR-1016	3.8	U	
AROCLOR-1221	3.8	U	
AROCLOR-1232	3.8	U	
AROCLOR-1242	3.8	U	
AROCLOR-1248	3.8	U	
AROCLOR-1254	3.8	U	
AROCLOR-1260	3.8	U	
BETA-BHC	0.1	U	
DELTA-BHC	0.1	U	
DIELDRIN	0.15	U	
ENDOSULFAN I	0.1	U	
ENDOSULFAN II	0.15	U	
ENDOSULFAN SULFATE	0.15	U	
ENDRIN	0.15	U	
ENDRIN ALDEHYDE	0.15	U	
ENDRIN KETONE	0.15	U	
GAMMA-BHC (LINDANE)	0.6	J	C
GAMMA-CHLORDANE	0.21	J	CP
HEPTACHLOR	0.1	U	
HEPTACHLOR EPOXIDE	0.1	U	
METHOXYCHLOR	0.1	U	
TOXAPHENE	10	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 03SB0401
 samp_date 8/15/2007
 lab_id 0708160-02
 qc_type NM
 units UG/KG
 Pct_Solids 80.7
 DUP_OF:

nsample 03SB0501
 samp_date 8/15/2007
 lab_id 0708160-03
 qc_type NM
 units UG/KG
 Pct_Solids 81.1
 DUP_OF:

nsample 03SB0601
 samp_date 8/16/2007
 lab_id 0708185-01
 qc_type NM
 units UG/KG
 Pct_Solids 83.1
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.16	U	
4,4'-DDE	0.16	U	
4,4'-DDT	0.16	U	
ALDRIN	0.11	U	
ALPHA-BHC	0.11	U	
ALPHA-CHLORDANE	0.11	U	
AROCLOR-1016	4.1	U	
AROCLOR-1221	4.1	U	
AROCLOR-1232	4.1	U	
AROCLOR-1242	4.1	U	
AROCLOR-1248	4.1	U	
AROCLOR-1254	4.1	U	
AROCLOR-1260	4.1	U	
BETA-BHC	0.11	U	
DELTA-BHC	0.11	U	
DIELDRIN	0.16	U	
ENDOSULFAN I	0.11	U	
ENDOSULFAN II	0.16	U	
ENDOSULFAN SULFATE	0.16	U	
ENDRIN	0.16	U	
ENDRIN ALDEHYDE	0.16	U	
ENDRIN KETONE	0.16	U	
GAMMA-BHC (LINDANE)	0.11	U	
GAMMA-CHLORDANE	0.35		
HEPTACHLOR	0.11	U	
HEPTACHLOR EPOXIDE	0.11	U	
METHOXYCHLOR	0.11	U	
TOXAPHENE	11	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.16	U	
4,4'-DDE	0.16	U	
4,4'-DDT	0.16	U	
ALDRIN	0.11	U	
ALPHA-BHC	0.11	U	
ALPHA-CHLORDANE	0.11	U	
AROCLOR-1016	4	U	
AROCLOR-1221	4	U	
AROCLOR-1232	4	U	
AROCLOR-1242	4	U	
AROCLOR-1248	4	U	
AROCLOR-1254	4	U	
AROCLOR-1260	4	U	
BETA-BHC	0.11	U	
DELTA-BHC	0.11	U	
DIELDRIN	0.16	U	
ENDOSULFAN I	0.11	U	
ENDOSULFAN II	0.16	U	
ENDOSULFAN SULFATE	0.16	U	
ENDRIN	0.16	U	
ENDRIN ALDEHYDE	0.16	U	
ENDRIN KETONE	0.16	U	
GAMMA-BHC (LINDANE)	0.11	U	
GAMMA-CHLORDANE	0.11	U	
HEPTACHLOR	0.11	U	
HEPTACHLOR EPOXIDE	0.11	U	
METHOXYCHLOR	0.11	U	
TOXAPHENE	11	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.16	U	
4,4'-DDE	0.16	U	
4,4'-DDT	0.23	J	P
ALDRIN	0.1	U	
ALPHA-BHC	0.1	U	
ALPHA-CHLORDANE	0.1	U	
AROCLOR-1016	3.9	U	
AROCLOR-1221	3.9	U	
AROCLOR-1232	3.9	U	
AROCLOR-1242	3.9	U	
AROCLOR-1248	3.9	U	
AROCLOR-1254	3.9	U	
AROCLOR-1260	3.9	U	
BETA-BHC	0.32	J	C
DELTA-BHC	0.1	U	
DIELDRIN	0.16	U	
ENDOSULFAN I	0.1	U	
ENDOSULFAN II	0.16	U	
ENDOSULFAN SULFATE	0.16	U	
ENDRIN	0.16	U	
ENDRIN ALDEHYDE	0.16	U	
ENDRIN KETONE	0.16	U	
GAMMA-BHC (LINDANE)	0.1	U	
GAMMA-CHLORDANE	0.1	U	
HEPTACHLOR	0.1	U	
HEPTACHLOR EPOXIDE	0.1	U	
METHOXYCHLOR	0.1	U	
TOXAPHENE	10	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 03SB0701
 samp_date 8/16/2007
 lab_id 0708185-03
 qc_type NM
 units UG/KG
 Pct_Solids 87.1
 DUP_OF:

nsample 03SB0801
 samp_date 8/16/2007
 lab_id 0708185-02
 qc_type NM
 units UG/KG
 Pct_Solids 84.7
 DUP_OF:

nsample 03SB0901
 samp_date 8/17/2007
 lab_id 0708191-01
 qc_type NM
 units UG/KG
 Pct_Solids 81.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.15	U	
4,4'-DDE	0.15	U	
4,4'-DDT	0.15	U	
ALDRIN	0.098	U	
ALPHA-BHC	0.098	U	
ALPHA-CHLORDANE	0.098	U	
AROCLOR-1016	3.7	U	
AROCLOR-1221	3.7	U	
AROCLOR-1232	3.7	U	
AROCLOR-1242	3.7	U	
AROCLOR-1248	3.7	U	
AROCLOR-1254	3.7	U	
AROCLOR-1260	3.7	U	
BETA-BHC	0.098	U	
DELTA-BHC	0.098	U	
DIELDRIN	0.15	U	
ENDOSULFAN I	0.098	U	
ENDOSULFAN II	0.15	U	
ENDOSULFAN SULFATE	0.15	U	
ENDRIN	0.15	U	
ENDRIN ALDEHYDE	0.15	U	
ENDRIN KETONE	0.15	U	
GAMMA-BHC (LINDANE)	0.098	U	
GAMMA-CHLORDANE	0.098	U	
HEPTACHLOR	0.098	U	
HEPTACHLOR EPOXIDE	0.098	U	
METHOXYCHLOR	0.098	U	
TOXAPHENE	9.8	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.15	U	
4,4'-DDE	0.15	U	
4,4'-DDT	0.15	U	
ALDRIN	0.1	U	
ALPHA-BHC	0.1	U	
ALPHA-CHLORDANE	0.1	U	
AROCLOR-1016	3.8	U	
AROCLOR-1221	3.8	U	
AROCLOR-1232	3.8	U	
AROCLOR-1242	3.8	U	
AROCLOR-1248	3.8	U	
AROCLOR-1254	3.8	U	
AROCLOR-1260	3.8	U	
BETA-BHC	0.1	U	
DELTA-BHC	0.1	U	
DIELDRIN	0.15	U	
ENDOSULFAN I	0.1	U	
ENDOSULFAN II	0.15	U	
ENDOSULFAN SULFATE	0.15	U	
ENDRIN	0.15	U	
ENDRIN ALDEHYDE	0.15	U	
ENDRIN KETONE	0.15	U	
GAMMA-BHC (LINDANE)	0.1	U	
GAMMA-CHLORDANE	0.2	J	P
HEPTACHLOR	0.1	U	
HEPTACHLOR EPOXIDE	0.1	U	
METHOXYCHLOR	0.1	U	
TOXAPHENE	10	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.16	U	
4,4'-DDE	0.16	U	
4,4'-DDT	0.48	J	P
ALDRIN	0.1	U	
ALPHA-BHC	0.1	U	
ALPHA-CHLORDANE	0.1	U	
AROCLOR-1016	4	U	
AROCLOR-1221	4	U	
AROCLOR-1232	4	U	
AROCLOR-1242	4	U	
AROCLOR-1248	4	U	
AROCLOR-1254	4	U	
AROCLOR-1260	4	U	
BETA-BHC	0.1	U	
DELTA-BHC	0.1	U	
DIELDRIN	0.16	U	
ENDOSULFAN I	0.1	U	
ENDOSULFAN II	0.16	U	
ENDOSULFAN SULFATE	0.16	U	
ENDRIN	0.16	U	
ENDRIN ALDEHYDE	0.16	U	
ENDRIN KETONE	0.16	U	
GAMMA-BHC (LINDANE)	0.1	U	
GAMMA-CHLORDANE	0.1	U	
HEPTACHLOR	0.1	U	
HEPTACHLOR EPOXIDE	0.1	U	
METHOXYCHLOR	0.1	U	
TOXAPHENE	10	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: PEST/PCB

nsample 03SB0901D
samp_date 8/17/2007
lab_id 0708191-02
qc_type NM
units UG/KG
Pct_Solids 80.7
DUP_OF: 03SB0901

nsample 03SB1001
samp_date 8/17/2007
lab_id 0708191-03
qc_type NM
units UG/KG
Pct_Solids 83.5
DUP_OF:

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.16	U	
4,4'-DDE	0.16	U	
4,4'-DDT	0.16	U	
ALDRIN	0.11	U	
ALPHA-BHC	0.11	U	
ALPHA-CHLORDANE	0.11	U	
AROCLOR-1016	4	U	
AROCLOR-1221	4	U	
AROCLOR-1232	4	U	
AROCLOR-1242	4	U	
AROCLOR-1248	4	U	
AROCLOR-1254	4	U	
AROCLOR-1260	4	U	
BETA-BHC	0.11	U	
DELTA-BHC	0.11	U	
DIELDRIN	0.16	U	
ENDOSULFAN I	0.11	U	
ENDOSULFAN II	0.16	U	
ENDOSULFAN SULFATE	0.16	U	
ENDRIN	0.16	U	
ENDRIN ALDEHYDE	0.16	U	
ENDRIN KETONE	0.16	U	
GAMMA-BHC (LINDANE)	0.11	U	
GAMMA-CHLORDANE	0.11	U	
HEPTACHLOR	0.11	U	
HEPTACHLOR EPOXIDE	0.11	U	
METHOXYCHLOR	0.11	U	
TOXAPHENE	11	U	

Parameter	Result	Val Qual	Qual Code
4,4'-DDD	0.16	U	
4,4'-DDE	0.16	U	
4,4'-DDT	0.16	U	
ALDRIN	0.1	U	
ALPHA-BHC	0.1	U	
ALPHA-CHLORDANE	0.1	U	
AROCLOR-1016	3.9	U	
AROCLOR-1221	3.9	U	
AROCLOR-1232	3.9	U	
AROCLOR-1242	3.9	U	
AROCLOR-1248	3.9	U	
AROCLOR-1254	3.9	U	
AROCLOR-1260	3.9	U	
BETA-BHC	2.1		
DELTA-BHC	0.1	U	
DIELDRIN	0.16	U	
ENDOSULFAN I	0.1	U	
ENDOSULFAN II	0.16	U	
ENDOSULFAN SULFATE	0.16	U	
ENDRIN	0.16	U	
ENDRIN ALDEHYDE	0.16	U	
ENDRIN KETONE	0.16	U	
GAMMA-BHC (LINDANE)	0.1	U	
GAMMA-CHLORDANE	0.1	U	
HEPTACHLOR	0.55		
HEPTACHLOR EPOXIDE	0.78		
METHOXYCHLOR	0.1	U	
TOXAPHENE	10	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: HERB

nsample 03SB0101
 samp_date 8/15/2007
 lab_id 0708135-01
 qc_type NM
 units UG/KG
 Pct_Solids 88.6
 DUP_OF:

nsample 03SB0201
 samp_date 8/14/2007
 lab_id 0708135-02
 qc_type NM
 units UG/KG
 Pct_Solids 85.1
 DUP_OF:

nsample 03SB0301
 samp_date 8/15/2007
 lab_id 0708160-01
 qc_type NM
 units UG/KG
 Pct_Solids 85.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.94	U	
2,4,5-TP (SILVEX)	0.94	U	
2,4-D	9.4	U	
2,4-DB	9.4	U	
DALAPON	24	U	
DICAMBA	0.94	U	
DICHLOROPROP	9.4	U	
DINOSEB	4.7	U	
MCPA	940	U	
MCPP	940	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.98	U	
2,4,5-TP (SILVEX)	0.98	U	
2,4-D	9.8	U	
2,4-DB	9.8	U	
DALAPON	24	U	
DICAMBA	0.98	U	
DICHLOROPROP	9.8	U	
DINOSEB	4.9	U	
MCPA	980	U	
MCPP	980	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.98	U	
2,4,5-TP (SILVEX)	0.98	U	
2,4-D	9.8	U	
2,4-DB	9.8	U	
DALAPON	24	U	
DICAMBA	0.98	U	
DICHLOROPROP	9.8	U	
DINOSEB	4.9	U	
MCPA	980	U	
MCPP	980	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: HERB

nsample 03SB0401
samp_date 8/15/2007
lab_id 0708160-02
qc_type NM
units UG/KG
Pct_Solids 80.7
DUP_OF:

nsample 03SB0501
samp_date 8/15/2007
lab_id 0708160-03
qc_type NM
units UG/KG
Pct_Solids 81.1
DUP_OF:

nsample 03SB0601
samp_date 8/16/2007
lab_id 0708185-01
qc_type NM
units UG/KG
Pct_Solids 83.1
DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	1	U	
2,4,5-TP (SILVEX)	1	U	
2,4-D	10	U	
2,4-DB	10	U	
DALAPON	26	U	
DICAMBA	1	U	
DICHLOROPROP	10	U	
DINOSEB	5.2	U	
MCPA	1000	U	
MCPP	1000	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	1	U	
2,4,5-TP (SILVEX)	1	U	
2,4-D	10	U	
2,4-DB	10	U	
DALAPON	26	U	
DICAMBA	1	U	
DICHLOROPROP	10	U	
DINOSEB	5.1	U	
MCPA	1000	U	
MCPP	1000	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	1	U	
2,4,5-TP (SILVEX)	1	U	
2,4-D	10	U	
2,4-DB	10	U	
DALAPON	25	U	
DICAMBA	1	U	
DICHLOROPROP	10	U	
DINOSEB	5	U	
MCPA	1000	U	
MCPP	1000	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: HERB

nsample 03SB0701
 samp_date 8/16/2007
 lab_id 0708185-03
 qc_type NM
 units UG/KG
 Pct_Solids 87.1
 DUP_OF:

nsample 03SB0801
 samp_date 8/16/2007
 lab_id 0708185-02
 qc_type NM
 units UG/KG
 Pct_Solids 84.7
 DUP_OF:

nsample 03SB0901
 samp_date 8/17/2007
 lab_id 0708191-01
 qc_type NM
 units UG/KG
 Pct_Solids 81.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.96	U	
2,4,5-TP (SILVEX)	0.96	U	
2,4-D	9.6	U	
2,4-DB	9.6	U	
DALAPON	24	U	
DICAMBA	0.96	U	
DICHLOROPROP	9.6	U	
DINOSEB	4.8	U	
MCPA	960	U	
MCPP	960	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	0.98	U	
2,4,5-TP (SILVEX)	0.98	U	
2,4-D	9.8	U	
2,4-DB	9.8	U	
DALAPON	24	U	
DICAMBA	0.98	U	
DICHLOROPROP	9.8	U	
DINOSEB	4.9	U	
MCPA	980	U	
MCPP	980	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	1	U	
2,4,5-TP (SILVEX)	1	U	
2,4-D	10	U	
2,4-DB	10	U	
DALAPON	26	U	
DICAMBA	1	U	
DICHLOROPROP	10	U	
DINOSEB	5.1	U	
MCPA	1000	U	
MCPP	1000	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: HERB

nsample 03SB0901D
samp_date 8/17/2007
lab_id 0708191-02
qc_type NM
units UG/KG
Pct_Solids 80.7
DUP_OF: 03SB0901

nsample 03SB1001
samp_date 8/17/2007
lab_id 0708191-03
qc_type NM
units UG/KG
Pct_Solids 83.5
DUP_OF:

Parameter	Result	Val Qual	Qual Code
2,4,5-T	1	U	
2,4,5-TP (SILVEX)	1	U	
2,4-D	10	U	
2,4-DB	10	U	
DALAPON	26	U	
DICAMBA	1	U	
DICHLOROPROP	10	U	
DINOSEB	5.2	U	
MCPA	1000	U	
MCPP	1000	U	

Parameter	Result	Val Qual	Qual Code
2,4,5-T	1	U	
2,4,5-TP (SILVEX)	1	U	
2,4-D	10	U	
2,4-DB	10	U	
DALAPON	25	U	
DICAMBA	1	U	
DICHLOROPROP	10	U	
DINOSEB	5	U	
MCPA	1000	U	
MCPP	1000	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: M

nsample 03SB0401
 samp_date 8/15/2007
 lab_id 0708160-02
 qc_type NM
 units MG/KG
 Pct_Solids 80.7
 DUP_OF:

nsample 03SB0501
 samp_date 8/15/2007
 lab_id 0708160-03
 qc_type NM
 units MG/KG
 Pct_Solids 81.1
 DUP_OF:

nsample 03SB0601
 samp_date 8/16/2007
 lab_id 0708185-01
 qc_type NM
 units MG/KG
 Pct_Solids 83.1
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	5990		
ANTIMONY	1.2	U	
ARSENIC	2.4		
BARIUM	24.1		
BERYLLIUM	0.24	U	
CADMIUM	0.24	U	
CALCIUM	235	U	
CHROMIUM	7.5		
COBALT	1.2	U	
COPPER	1.3		
IRON	6640		
LEAD	4.8		
MAGNESIUM	238		
MANGANESE	4.4		
MERCURY	0.014	U	
NICKEL	1.2	U	
POTASSIUM	235	U	
SELENIUM	0.71	U	
SILVER	0.24	U	
SODIUM	235	U	
THALLIUM	0.71	U	
VANADIUM	13.8		
ZINC	5.2		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	2630		
ANTIMONY	1.1	U	
ARSENIC	0.67	U	
BARIUM	4.4		
BERYLLIUM	0.22	U	
CADMIUM	0.22	U	
CALCIUM	224	U	
CHROMIUM	2.4		
COBALT	1.1	U	
COPPER	1.1	U	
IRON	390		
LEAD	2.2		
MAGNESIUM	224	U	
MANGANESE	1.8		
MERCURY	0.017	U	
NICKEL	1.1	U	
POTASSIUM	224	U	
SELENIUM	0.67	U	
SILVER	0.22	U	
SODIUM	224	U	
THALLIUM	0.67	U	
VANADIUM	3.5		
ZINC	1.2		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	1420		
ANTIMONY	1.3	U	
ARSENIC	0.75	U	
BARIUM	2.8		
BERYLLIUM	0.25	U	
CADMIUM	0.25	U	
CALCIUM	251	UU	C
CHROMIUM	2.2		
COBALT	1.3	U	
COPPER	1.3	U	
IRON	766		
LEAD	1.7	U	A
MAGNESIUM	251	U	
MANGANESE	1.9		
MERCURY	0.014	U	
NICKEL	1.3	U	
POTASSIUM	251	U	
SELENIUM	0.75	U	
SILVER	0.25	U	
SODIUM	251	U	
THALLIUM	0.75	U	
VANADIUM	2		
ZINC	1.3	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: M

nsample 03SB0701
 samp_date 8/16/2007
 lab_id 0708185-03
 qc_type NM
 units MG/KG
 Pct_Solids 87.1
 DUP_OF:

nsample 03SB0801
 samp_date 8/16/2007
 lab_id 0708185-02
 qc_type NM
 units MG/KG
 Pct_Solids 84.7
 DUP_OF:

nsample 03SB0901
 samp_date 8/17/2007
 lab_id 0708191-01
 qc_type NM
 units MG/KG
 Pct_Solids 81.4
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	443		
ANTIMONY	1.2	U	
ARSENIC	0.72	U	
BARIUM	5		
BERYLLIUM	0.24	U	
CADMIUM	0.24	U	
CALCIUM	239	UJ	C
CHROMIUM	1.5		
COBALT	1.2	U	
COPPER	1.2	U	
IRON	558		
LEAD	1.0	U	A
MAGNESIUM	239	U	
MANGANESE	1.6		
MERCURY	0.015	U	
NICKEL	1.2	U	
POTASSIUM	239	U	
SELENIUM	0.72	U	
SILVER	0.24	U	
SODIUM	239	U	
THALLIUM	0.72	U	
VANADIUM	1.2	U	
ZINC	1.2	U	

Parameter	Result	Val Qual	Qual Code
ALUMINUM	7280		
ANTIMONY	1.2	U	
ARSENIC	0.69	U	
BARIUM	7.5		
BERYLLIUM	0.23	U	
CADMIUM	0.23	U	
CALCIUM	231	UJ	C
CHROMIUM	5.8		
COBALT	1.2	U	
COPPER	1.2	U	
IRON	2230		
LEAD	3.0		
MAGNESIUM	231	U	
MANGANESE	2.6		
MERCURY	0.013	U	
NICKEL	1.3		
POTASSIUM	231	U	
SELENIUM	0.69	U	
SILVER	0.23	U	
SODIUM	231	U	
THALLIUM	0.69	U	
VANADIUM	8.3		
ZINC	2.2		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	2370		
ANTIMONY	1.2	U	
ARSENIC	0.7	U	
BARIUM	3.0		
BERYLLIUM	0.23	U	
CADMIUM	0.23	U	
CALCIUM	233	UJ	C
CHROMIUM	2.9		
COBALT	1.2	U	
COPPER	1.2	U	
IRON	812		
LEAD	1.9	U	A
MAGNESIUM	233	U	
MANGANESE	2.6		
MERCURY	0.015	U	
NICKEL	1.2	U	
POTASSIUM	233	U	
SELENIUM	0.7	U	
SILVER	0.23	U	
SODIUM	233	U	
THALLIUM	0.7	U	
VANADIUM	3.3		
ZINC	4.0		

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: M

nsample 03SB0901D
 samp_date 8/17/2007
 lab_id 0708191-02
 qc_type NM
 units MG/KG
 Pct_Solids 80.7
 DUP_OF: 03SB0901

nsample 03SB1001
 samp_date 8/17/2007
 lab_id 0708191-03
 qc_type NM
 units MG/KG
 Pct_Solids 83.5
 DUP_OF:

Parameter	Result	Val Qual	Qual Code
ALUMINUM	3080		
ANTIMONY	1.1	U	
ARSENIC	0.79		
BARIUM	3.9		
BERYLLIUM	0.22	U	
CADMIUM	0.22	U	
CALCIUM	260	J	C
CHROMIUM	3.5		
COBALT	1.1	U	
COPPER	1.1	U	
IRON	1090		
LEAD	2.3		
MAGNESIUM	224	U	
MANGANESE	3.2		
MERCURY	0.017	U	
NICKEL	1.1	U	
POTASSIUM	224	U	
SELENIUM	0.67	U	
SILVER	0.22	U	
SODIUM	224	U	
THALLIUM	0.67	U	
VANADIUM	4.3		
ZINC	5.0		

Parameter	Result	Val Qual	Qual Code
ALUMINUM	2420		
ANTIMONY	1.2	U	
ARSENIC	0.73	U	
BARIUM	7.2		
BERYLLIUM	0.24	U	
CADMIUM	0.24	U	
CALCIUM	243	UJ	C
CHROMIUM	2.9		
COBALT	1.2	U	
COPPER	1.2	U	
IRON	874		
LEAD	2.1	U	A
MAGNESIUM	243	U	
MANGANESE	3.1		
MERCURY	0.014	U	
NICKEL	1.2	U	
POTASSIUM	243	U	
SELENIUM	0.73	U	
SILVER	0.24	U	
SODIUM	243	U	
THALLIUM	0.73	U	
VANADIUM	3.5		
ZINC	6.7		

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: MISC

nsample 03SB0101
samp_date 8/14/2007
lab_id 0708135-01
qc_type NM
Pct_Solids 88.6
DUP_OF:

nsample 03SB0201
samp_date 8/14/2007
lab_id 0708135-02
qc_type NM
Pct_Solids 85.1
DUP_OF:

nsample 03SB0301
samp_date 8/15/2007
lab_id 0708160-01
qc_type NM
Pct_Solids 85.4
DUP_OF:

Parameter	units	Result	Val Qual	Qual Code
CYANIDE	MG/KG	0.14	U	

Parameter	units	Result	Val Qual	Qual Code
CYANIDE	MG/KG	0.15	U	

Parameter	units	Result	Val Qual	Qual Code
CYANIDE	MG/KG	0.15	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: MISC

nsample 03SB0401
 samp_date 8/15/2007
 lab_id 0708160-02
 qc_type NM
 Pct_Solids 80.7
 DUP_OF:

nsample 03SB0501
 samp_date 8/15/2007
 lab_id 0708160-03
 qc_type NM
 Pct_Solids 81.1
 DUP_OF:

nsample 03SB0601
 samp_date 8/16/2007
 lab_id 0708185-01
 qc_type NM
 Pct_Solids 83.1
 DUP_OF:

Parameter	units	Result	Val Qual	Qual Code
CYANIDE	MG/KG	0.15	U	

Parameter	units	Result	Val Qual	Qual Code
CYANIDE	MG/KG	0.15	U	

Parameter	units	Result	Val Qual	Qual Code
CYANIDE	MG/KG	0.15	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: MISC

nsample 03SB0701
samp_date 8/16/2007
lab_id 0708185-03
qc_type NM
Pct_Solids 87.1
DUP_OF:

nsample 03SB0801
samp_date 8/16/2007
lab_id 0708185-02
qc_type NM
Pct_Solids 84.7
DUP_OF:

nsample 03SB0901
samp_date 8/17/2007
lab_id 0708191-01
qc_type NM
Pct_Solids 81.4
DUP_OF:

Parameter	units	Result	Val Qual	Qual Code
CYANIDE	MG/KG	0.14	U	

Parameter	units	Result	Val Qual	Qual Code
CYANIDE	MG/KG	0.15	U	

Parameter	units	Result	Val Qual	Qual Code
CYANIDE	MG/KG	0.15	U	

PROJ_NO: 00464

SDG: GPSITE3-001 MEDIA: SOIL DATA FRACTION: MISC

nsample 03SB0901D
samp_date 8/17/2007
lab_id 0708191-02
qc_type NM
Pct_Solids 80.7
DUP_OF: 03SB0901

nsample 03SB1001
samp_date 8/17/2007
lab_id 0708191-03
qc_type NM
Pct_Solids 83.5
DUP_OF:

Parameter	units	Result	Val Qual	Qual Code
CYANIDE	MG/KG	0.15	U	

Parameter	units	Result	Val Qual	Qual Code
CYANIDE	MG/KG	0.15	U	

TO: FISHER, R – PAGE 2
DATE: OCTOBER 22, 2007

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A
QUALIFIED ANALYTICAL RESULTS

PROJ_NO: 00464

SDG: 0708198 MEDIA: SOIL DATA FRACTION: MISC

nsample 03GPT18
 samp_date 8/17/2007
 lab_id 0708198-01A
 qc_type NM
 Pct_Solids
 DUP_OF:

nsample 03GPT25
 samp_date 8/17/2007
 lab_id 0708198-02A
 qc_type NM
 Pct_Solids
 DUP_OF:

nsample 03GPT31
 samp_date 8/17/2007
 lab_id 0708198-03A
 qc_type NM
 Pct_Solids
 DUP_OF:

Parameter	units	Result	Val Qual	Qual Code
HYDROMETER-0.005MM	MM	12		
HYDROMETER-0.024MM	MM	36		
PERCENT CLAY	%	12		
PERCENT GRAVEL	%	0		
PERCENT SAND	%	11		
PERCENT SILT	%	77		
SIEVE 1"	%	100		
SIEVE 1/2"	%	100		
SIEVE 3/4"	%	100		
SIEVE NO. 004	%	100		
SIEVE NO. 010	%	100		
SIEVE NO. 040	%	100		
SIEVE NO. 100	%	99		
SIEVE NO. 200	%	89		

Parameter	units	Result	Val Qual	Qual Code
HYDROMETER-0.005MM	MM	46		
HYDROMETER-0.024MM	MM	64		
PERCENT CLAY	%	46		
PERCENT GRAVEL	%	0		
PERCENT SAND	%	13		
PERCENT SILT	%	41		
SIEVE 1"	%	100		
SIEVE 1/2"	%	100		
SIEVE 3/4"	%	100		
SIEVE NO. 004	%	100		
SIEVE NO. 010	%	100		
SIEVE NO. 040	%	100		
SIEVE NO. 100	%	100		
SIEVE NO. 200	%	87		

Parameter	units	Result	Val Qual	Qual Code
HYDROMETER-0.005MM	MM	14		
HYDROMETER-0.024MM	MM	40		
PERCENT CLAY	%	14		
PERCENT GRAVEL	%	0		
PERCENT SAND	%	9		
PERCENT SILT	%	77		
SIEVE 1"	%	100		
SIEVE 1/2"	%	100		
SIEVE 3/4"	%	100		
SIEVE NO. 004	%	100		
SIEVE NO. 010	%	100		
SIEVE NO. 040	%	100		
SIEVE NO. 100	%	100		
SIEVE NO. 200	%	91		

PROJ_NO: 00464

SDG: 0708198 MEDIA: SOIL DATA FRACTION: MISC

nsample 05GPT01
samp_date 8/17/2007
lab_id 0708198-04A
qc_type NM
Pct_Solids
DUP_OF:

Parameter	units	Result	Val Qual	Qual Code
HYDROMETER-0.005MM	MM	12		
HYDROMETER-0.024MM	MM	34		
PERCENT CLAY	%	12		
PERCENT GRAVEL	%	0		
PERCENT SAND	%	18		
PERCENT SILT	%	70		
SIEVE 1"	%	100		
SIEVE 1/2"	%	100		
SIEVE 3/4"	%	100		
SIEVE NO. 004	%	100		
SIEVE NO. 010	%	100		
SIEVE NO. 040	%	98		
SIEVE NO. 100	%	92		
SIEVE NO. 200	%	82		

APPENDIX D

HUMAN HEALTH RISK ASSESSMENT SUPPORTING DATA

APPENDIX D

SUPPORTING INFORMATION FOR HEALTH RISK ASSESSMENT

- D.1 RAGS Part D Tables**
- D.2 Sample Calculations**
- D.3 Lead Modeling Results**
- D.4 Vapor Intrusion Modeling Results**

APPENDIX D.1

RAGS-PART D TABLES

RAGS Part D Table 1
Selection Of Exposure Pathways

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
NCBC GULFPORT
GULFPORT, MISSISSIPPI
PAGE 1 OF 3

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway		
Current/Future	Surface Soil	Surface Soil	Site 3	Construction Workers	Adult	Ingestion Dermal	Quant Quant	Construction workers may have contact with surface soil during excavation activities.		
				Maintenance Worker	Adult	Ingestion Dermal	Quant Quant	Maintenance workers may contact surface soil during normal work activities.		
				Industrial Worker	Adult	Ingestion Dermal	Quant Quant	Industrial workers may contact surface soil during normal work activities.		
				Trespassers	Adolescents	Ingestion Dermal	Quant Quant	Trespassers may contact surface soil while at the site.		
					Adult	Ingestion Dermal	Quant Quant	Trespassers may contact surface soil while at the site.		
			Air	Site 3	Construction Workers	Adult	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.	
					Maintenance Worker	Adult	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.	
					Industrial Worker	Adult	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.	
					Trespassers	Adolescents	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.	
						Adult	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.	
	Subsurface Soil	Subsurface Soil	Site 3	Construction Workers	Adult	Ingestion Dermal	Quant Quant	Construction workers may have contact with subsurface soil during excavation activities.		
				Maintenance Worker	Adult	Ingestion Dermal	None None	Although exposures to subsurface soil by maintenance workers is considered unlikely at the site this scenario is included to aid in future risk management decisions.		
				Industrial Worker	Adult	Ingestion Dermal	Quant Quant	Although exposures to subsurface soil by industrial workers is considered unlikely at the site this scenario is included to aid in future risk management decisions.		
				Trespassers	Adolescents	Ingestion Dermal	None None	Although exposures to subsurface soil by adolescent trespassers is considered unlikely at the site this scenario is included to aid in future risk management decisions.		
					Adult	Ingestion Dermal	None None	Although exposures to subsurface soil by adult trespassers is considered unlikely at the site this scenario is included to aid in future risk management decisions.		
				Air	Site 3	Construction Workers	Adult	Inhalation	None	No COPCs were identified in subsurface soil for the inhalation exposure pathway.
						Maintenance Worker	Adult	Inhalation	None	No COPCs were identified in subsurface soil for the inhalation exposure pathway.
						Industrial Worker	Adult	Inhalation	Quant	No COPCs were identified in subsurface soil for the inhalation exposure pathway.
						Trespassers	Adolescents	Inhalation	None	No COPCs were identified in subsurface soil for the inhalation exposure pathway.
							Adult	Inhalation	None	No COPCs were identified in subsurface soil for the inhalation exposure pathway.
Groundwater		Groundwater	Site 3	Construction Workers	Adult	Ingestion Dermal	None Quant	Construction workers are not expected to ingest groundwater. Construction workers may have dermal contact with ground water during excavation activities.		
				Maintenance Workers	Adult	Ingestion Dermal	None None	Maintenance workers are not expected to have contact with groundwater.		

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
NCBC GULFPORT
GULFPORT, MISSISSIPPI
PAGE 2 OF 3

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway		
Current/Future	Groundwater	Groundwater	Site 3	Industrial Worker	Adult	Ingestion Dermal	Quant Quant	Industrial workers are not expected to have contact with groundwater.		
				Trespassers	Adolescents	Ingestion Dermal	None None	Adolescent trespassers are not expected to be exposed to groundwater.		
					Adult	Ingestion Dermal	None None	Adolescent trespassers are not expected to be exposed to groundwater.		
	Air	Air	Site 3	Construction Workers	Adult	Inhalation	Quant	Construction workers may be exposed to COPCs that have volatilized from groundwater during excavation activities.		
				Maintenance Workers	Adult	Inhalation	None	Maintenance workers are not expected to be exposed to COPCs that have volatilized from groundwater.		
				Industrial Worker	Adult	Inhalation	None	Industrial workers are not expected to be exposed to COPCs that have volatilized from groundwater.		
				Trespassers	Adolescents	Inhalation	None	Adolescent Trespassers are not expected to be exposed to COPCs that have volatilized from groundwater.		
					Adult	Inhalation	None	Adolescent Trespassers are not expected to be exposed to COPCs that have volatilized from groundwater.		
	Vapor Intrusion	Industrial Worker	Adult	Inhalation	None	Industrial workers may be exposed to COPCs that have volatilized from groundwater and migrated through building foundations into indoor air				
	Surface Water	Surface Water	Site 3	Construction Workers	Adult	Ingestion Dermal	Quant Quant	Construction workers may have contact with surface water during excavation activities.		
				Maintenance Worker	Adult	Ingestion Dermal	Quant Quant	Maintenance workers may contact surface water during normal work activities.		
				Industrial Worker	Adult	Ingestion Dermal	Quant Quant	Industrial workers may contact surface water during normal work activities.		
				Trespassers	Adolescents	Ingestion Dermal	Quant Quant	Adolescent trespassers may contact surface water while at the site.		
					Adult	Ingestion Dermal	Quant Quant	Adult trespassers may contact surface water while at the site.		
				Sediment	Sediment	Site 3	Construction Workers	Adult	Ingestion Dermal	Quant Quant
Maintenance Worker							Adult	Ingestion Dermal	Quant Quant	Maintenance workers may contact sediment during normal work activities.
Industrial Worker							Adult	Ingestion Dermal	Quant Quant	Industrial workers may contact sediment during normal work activities.
Trespassers	Adolescents	Ingestion Dermal	Quant Quant				Adolescent trespassers may contact sediment while at the site.			
	Adult	Ingestion Dermal	Quant Quant	Adult trespassers may contact sediment while at the site.						
Future	Surface Soil	Surface Soil	Site 3	Residents	Child	Ingestion Dermal	Quant Quant	Although a future residential scenario is considered unlikely at the site this scenario is included to aid in future risk management decisions.		
					Adult	Ingestion Dermal	Quant Quant	Although a future residential scenario is considered unlikely at the site this scenario is included to aid in future risk management decisions.		

TABLE 1
SELECTION OF EXPOSURE PATHWAYS
NCBC GULFPORT
GULFPORT, MISSISSIPPI
PAGE 3 OF 3

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface Soil	Air	Site 3	Residents	Child	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.
					Adult	Inhalation	None	No COPCs were identified in surface soil for the inhalation exposure pathway.
	Subsurface Soil	Subsurface Soil	Site 3	Residents	Child	Ingestion Dermal	Quant Quant	Although a future residential scenario is considered unlikely at the site this scenario is included to aid in future risk management decisions.
					Adult	Ingestion Dermal	Quant Quant	Although a future residential scenario is considered unlikely at the site this scenario is included to aid in future risk management decisions.
		Air	Site 3	Residents	Child	Inhalation	Quant	No COPCs were identified in subsurface soil for the inhalation exposure pathway.
					Adult	Inhalation	Quant	No COPCs were identified in subsurface soil for the inhalation exposure pathway.
	Groundwater	Groundwater	Site 3	Residents	Child	Ingestion Dermal	Quant Quant	Although a future residential scenario is considered unlikely at the site, this scenario is included to aid in future risk management decisions.
					Adult	Ingestion Dermal	Quant Quant	Although a future residential scenario is considered unlikely at the site, this scenario is included to aid in future risk management decisions.
		Air	Site 3	Residents	Child	Inhalation	Quant	Although a future residential scenario is considered unlikely at the site, this scenario is included to aid in future risk management decisions.
					Adult	Inhalation	Quant	Although a future residential scenario is considered unlikely at the site, this scenario is included to aid in future risk management decisions.
		Vapor Intrusion	Residents	Child	Inhalation	Quant	Child Residents may be exposed to COPCs that have volatilized from groundwater and migrated through building foundations into indoor air.	
				Adult	Inhalation	Quant	Adult Residents may be exposed to COPCs that have volatilized from groundwater and migrated through building foundations into indoor air.	
	Surface Water	Surface Water	Site 3	Residents	Child	Ingestion Dermal	Quant Quant	Although a future residential scenario is considered unlikely at the site this scenario is included to aid in future risk management decisions.
					Adult	Ingestion Dermal	Quant Quant	Although a future residential scenario is considered unlikely at the site this scenario is included to aid in future risk management decisions.
	Sediment	Sediment	Site 3	Residents	Child	Ingestion Dermal	Quant Quant	Although a future residential scenario is considered unlikely at the site this scenario is included to aid in future risk management decisions.
					Adult	Ingestion Dermal	Quant Quant	Although a future residential scenario is considered unlikely at the site this scenario is included to aid in future risk management decisions.

Notes:
Quant - Quantitative.

RAGS Part D Table 2

**Occurrence, Distribution And Selection
Of Chemicals Of Potential Concern**

LIST OF TABLES
RAGS PART D TABLE 2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Table No.

- 2.1 Direct Contact With Surface Soil
- 2.2 Migration From Surface Soil
- 2.3 Direct Contact With Subsurface Soil
- 2.4 Migration From Subsurface Soil
- 2.5 Groundwater - Direct Contact
- 2.6 Groundwater - Vapor Intrusion
- 2.7 Surface Water
- 2.8 Sediment

**TABLE 2.1
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
NCBC GULFPORT
GULFPORT, MISSISSIPPI
PAGE 1 OF 2**

Scenario Timeframe:
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TARs Unrestricted Value ⁽⁵⁾	MDEQ TARs Restricted Value ⁽⁵⁾	USEPA Region IX PRGs Residential ⁽⁶⁾	USEPA SSLs Soil to Air ⁽⁷⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁸⁾	
Site 3	Volatile Organic Compounds																
	67-86-3	Chloroform	0.61 J	0.61 J	ug/kg	03SS0801	1/10	5 - 7.5	0.61	NA	312 C	478 C	220 C	280 C	No	BSL	
	Semivolatile Organic Compounds																
		Benzo(a)pyrene Equivalents	207.55	264.62	ug/kg	03SS0101	3/10	360 - 450	264.62	NA	87.5 C	784 C	15 C	NA	Yes	ASL	
	56-55-3	Benzo(a)anthracene	84 J	170 J	ug/kg	03SS0901	3/10	360 - 450	170	NA	875 C	7840 C	150 C	NA	Yes	ASL	
	50-32-8	Benzo(a)pyrene	170 J	210 J	ug/kg	03SS0101	3/10	360 - 450	210	NA	87.5 C	784 C	15 C	NA	Yes	ASL	
	205-99-2	Benzo(b)fluoranthene	270 J	360 J	ug/kg	03SS0101	3/10	360 - 450	360	NA	875 C	7840 C	150 C	NA	Yes	ASL	
	191-24-2	Benzo(g,h,i)perylene	100 J	100 J	ug/kg	03SS0901	1/10	360 - 450	100	NA	235000 N ⁽⁹⁾	6130000 N ⁽⁹⁾	230000 N ⁽⁹⁾	NA	No	BSL	
	207-08-9	Benzo(k)fluoranthene	200 J	240 J	ug/kg	03SS0101, 03SS0901	3/10	360 - 450	240	NA	8750 C	78400 C	1500 C	NA	No	BSL	
	117-81-7	Bis(2-ethylhexyl)phthalate	52 J	280 J	ug/kg	03SS0901	6/10	370 - 450	280	NA	45600 C	409000 C	35000 C	NA	No	BSL	
	105-60-2	Caprolactam	170 J	260 J	ug/kg	03SS0301	2/10	360 - 430	260	NA	3910000 N	10200000 N	3100000 N	NA	No	BSL	
	218-01-9	Chrysene	150 J	230 J	ug/kg	03SS0901	3/10	360 - 450	230	NA	87500 C	784000 C	15000 C ⁽¹⁰⁾	NA	No	BSL	
	206-44-0	Fluoranthene	73 J	160 J	ug/kg	03SS0101	3/10	360 - 450	160	NA	313000 N	8170000 N	230000 N	NA	No	BSL	
	129-00-0	Pyrene	140 J	370 J	ug/kg	03SS0101	3/10	360 - 450	370	NA	235000 N	6130000 N	230000 N	NA	No	BSL	
	Pesticides/PCBs																
	72-54-8	4,4'-DDD	0.73 J	3.3 J	ug/kg	03SS1001	4/10	0.56 - 0.72	3.3	NA	2860 C	23800 C	2400 C	NA	No	BSL	
	72-55-9	4,4'-DDE	0.73 J	4.9	ug/kg	03SS0101	4/10	0.56 - 0.72	4.9	NA	1880 C	16800 C	1700 C	NA	No	BSL	
	50-29-3	4,4'-DDT	0.29 J	17 J	ug/kg	03SS1001	5/10	0.58 - 0.72	17	NA	1880 C	16800 C	1700 C	750000 C	No	BSL	
	309-00-2	Aldrin	0.31 J	0.66 J	ug/kg	03SS1001	2/10	0.28 - 0.36	0.66	NA	37.6 C	337 C	29 C	3400 C	No	BSL	
	319-84-6	alpha-BHC	0.22 J	0.68 J	ug/kg	03SS0701	4/10	0.28 - 0.36	0.68	NA	101 C	908 C	90 C	750 C	No	BSL	
	5103-71-9	alpha-Chlordane	0.14 J	26 J	ug/kg	03SS0901	7/10	0.29 - 0.36	26	NA	1820 C ⁽¹¹⁾	12300 C ⁽¹¹⁾	1600 C ⁽¹¹⁾	72000 C	No	BSL	
	319-85-7	beta-BHC	0.11 J	0.19 J	ug/kg	03SS0201	3/10	0.29 - 0.36	0.19	NA	355 C	3180 C	320 C	6000 C	No	BSL	
	60-57-1	Dieldrin	0.17 J	3.7 J	ug/kg	03SS0701	6/10	0.58 - 0.72	3.7	NA	39.9 C	358 C	30 C	1100 C	No	BSL	
	33213-85-9	Endosulfan II	0.28 J	1.5 J	ug/kg	03SS0901	4/10	0.56 - 0.72	1.5	NA	46900 N ⁽¹²⁾	123000 N ⁽¹²⁾	37000 N ⁽¹²⁾	NA	No	BSL	
	1031-07-8	Endosulfan Sulfate	2.1 J	2.1 J	ug/kg	03SS0901	1/10	0.56 - 0.72	2.1	NA	46900 N ⁽¹²⁾	123000 N ⁽¹²⁾	37000 N ⁽¹²⁾	NA	No	BSL	
	72-20-8	Endrin	0.62 J	0.62 J	ug/kg	03SS1001	1/10	0.56 - 0.72	0.62	NA	2350 N	6130 N	1800 N	NA	No	BSL	
	7421-93-4	Endrin Aldehyde	0.18 J	0.45 J	ug/kg	03SS0101	2/10	0.56 - 0.72	0.45	NA	2350 N ⁽¹³⁾	6130 N ⁽¹³⁾	1800 N ⁽¹³⁾	NA	No	BSL	
	58-89-9	gamma-BHC (Lindane)	0.45 J	1.2 J	ug/kg	03SS0301	5/10	0.29 - 0.32	1.2	NA	491 C	4400 C	440 C	NA	No	BSL	
	5103-74-2	gamma-Chlordane	0.098 J	14 J	ug/kg	03SS0901	6/10	0.28 - 0.36	14	NA	1820 C ⁽¹¹⁾	12300 C ⁽¹¹⁾	1600 C ⁽¹¹⁾	72000 C	No	BSL	
	1024-57-3	Heptachlor Epoxide	0.23 J	0.47 J	ug/kg	03SS0101	3/10	0.28 - 0.36	0.47	NA	70.2 C	629 C	53 C	4700 C	No	BSL	
	Herbicides																
	88-85-7	Dinoseb	14 J	14 J	ug/kg	03SS1001	1/10	13 - 17	14	NA	7820 N	20400 N	6100 N	NA	No	BSL	
	Inorganics																
	7429-90-5	Aluminum	2670	7300	mg/kg	03SS0701	10/10	-	7300	NA	7820 N	204000 N	7500 N ⁽¹⁰⁾	709000 N	No	BSL	
	7440-36-0	Antimony	1.2 J	1.2 J	mg/kg	03SS0901	1/10	0.99 - 1.2	1.2	NA	3.13 N	8.17 N	3.1 N	NA	No	BSL	
	7440-38-2	Arsenic	1.1	6	mg/kg	03SS0901	10/10	-	6	NA	0.426 C	3.82 C	0.39 C	769 C	Yes	ASL	
	7440-39-3	Barium	6.7	23.2	mg/kg	03SS0901	10/10	-	23.2	NA	548 N	1430 N	1500 N ⁽¹⁰⁾	70900 N	No	BSL	
	7440-43-9	Cadmium	0.91	0.91	mg/kg	03SS0901	1/10	0.2 - 0.25	0.91	NA	3.91 N	102 N	3.7 N	1840 C	No	BSL	
	7440-70-2	Calcium	497 J	4560 J	mg/kg	03SS0501	6/10	204 - 246	4560	NA	NA	NA	NA	NA	No	NUT	
	7440-47-3	Chromium	2.8 J	10.6 J	mg/kg	03SS0901	10/10	-	10.6	NA	227 C ⁽¹⁴⁾	381 C ⁽¹⁴⁾	30 C	276 C	No	BSL	
	7440-48-4	Cobalt	1.1	2.1	mg/kg	03SS1001D	3/10	0.99 - 1.2	2.1	NA	469 N	1230 N	140 N ⁽¹⁵⁾	1180 C	No	BSL	
	7440-50-8	Copper	1.3	15.2	mg/kg	03SS0901	5/10	0.99 - 1.2	15.2	NA	313 N	817 N	310 N	NA	No	BSL	
	7439-89-6	Iron	2560 J	12900 J	mg/kg	03SS0401	10/10	-	12900	NA	2350 N	61300 N	5500 N	NA	Yes	ASL	
	7439-92-1	Lead	2.6 J	59.3 J	mg/kg	03SS0901	10/10	-	59.3	NA	400	1700	400	NA	No	BSL	
	7439-95-4	Magnesium	277 J	1080 J	mg/kg	03SS0901	2/10	197 - 246	1080	NA	NA	NA	NA	NA	No	NUT	
	7439-96-5	Manganese	1.9 J	44.2 J	mg/kg	03SS0901	10/10	-	44.2	NA	156 N	408 N	180 N	7090 N	No	BSL	
	7439-97-6	Mercury	0.014	0.08	mg/kg	03SS0701	5/10	0.013 - 0.015	0.08	NA	1 N	6.13 N	2.3 N	NA	No	BSL	
	7440-02-0	Nickel	1.4	8	mg/kg	03SS0901	7/10	1 - 1.2	8	NA	156 N	408 N	160 N	NA	No	BSL	
	7782-49-2	Selenium	0.68	0.68	mg/kg	03SS0401	1/10	0.61 - 0.74	0.68	NA	39.1 N	102 N	39 N	NA	No	BSL	
	7440-62-2	Vanadium	5.1	18.8	mg/kg	03SS0401	10/10	-	18.8	NA	54.8 N	143 N	7.8 N	NA	Yes	ASL	
	7440-66-6	Zinc	1.7 J	255 J	mg/kg	03SS0901	10/10	-	255	NA	2350 N	6130 N	2300 N	NA	No	BSL	
	Miscellaneous Parameters																
	57-12-5	Cyanide	0.14	0.14	mg/kg	03SS0601	1/10	0.13 - 0.17	0.14	NA	156 N ⁽¹⁶⁾	408 N ⁽¹⁶⁾	120 N ⁽¹⁶⁾	NA	No	BSL	

TABLE 2.1
 OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
 NCBC GULFPORT
 GULFPORT, MISSISSIPPI
 PAGE 2 OF 2

Scenario Timeframe: Medium: Surface Soil Exposure Medium: Surface Soil
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Exposure Point	CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TARs Unrestricted Value ⁽⁵⁾	MDEQ TARs Restricted Value ⁽⁵⁾	USEPA Region IX PRGs Residential ⁽⁶⁾	USEPA SSLs Soil to Air ⁽⁷⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁸⁾
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Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
- 2 - Values presented are sample-specific quantitation limits.
- 3 - The maximum detected concentration is used for screening purposes.
- 4 - No background soil samples were collected
- 5 - Mississippi Department of Environmental Quality (MDEQ), Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites for Unrestricted and Restricted Land Use, February 2002. Noncarcinogenic values are divided by 10.
- 6 - USEPA Region IX Preliminary Remediation Goal (PRG). The noncarcinogenic values (denoted with a "N" flag) are the PRG divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag) (USEPA Region IX, October 2004, Updated December 28, 2004).
- 7 - EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm. Noncarcinogenic values are divided by 10.
- 8 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
- 9 - Pyrene is used as a surrogate for benzo(g,h,i)perylene.
- 10 - The toxicity criteria in the October 2004 PRG table is outdated. Value was updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table.
- 11 - Chlordane is used as a surrogate for alpha- and gamma-chlordane.
- 12 - Endosulfan is used as a surrogate for Endosulfan Sulfate and Endosulfan II.
- 13 - Endrin is used as a surrogate for Endrin Aldehyde.
- 14 - Values are for hexavalent chromium.
- 15 - One tenth of the noncarcinogenic PRG is less than the carcinogenic PRG, therefore the one tenth noncarcinogenic PRG is presented.
- 16 - Value is for free cyanide.

Definitions:

- ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
 C = Carcinogen
 COPC = Chemical Of Potential Concern
 J = Estimated value
 N = Noncarcinogen
 NA = Not Applicable/Not Available
 sat = soil saturation concentration

Rationale Codes:

- For selection as a COPC:
 ASL = Above Screening Level and site background.

- For elimination as a COPC:
 BSL = Below COPC Screening Level
 NUT = Essential nutrient
 NTX = No toxicity criteria

Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples

- 03SS0101
- 03SS0201
- 03SS0301
- 03SS0401
- 03SS0501
- 03SS0601
- 03SS0701
- 03SS0801
- 03SS0901
- 03SS1001
- 03SS1001D

TABLE 2.2
 OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
 NCBC GULFPORT
 GULFPORT, MISSISSIPPI
 PAGE 1 OF 2

Scenario Timeframe:
 Medium: Surface Soil
 Exposure Medium: Surface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	USEPA SSL Soil to Groundwater ⁽⁵⁾	Potential ARAR/TBC	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁶⁾	
Site 3	Volatile Organic Compounds															
	67-66-3	Chloroform	0.61 J	0.61 J	ug/kg	03SS0801	1/10	5 - 7.5	0.61	NA	29 MCL	NA	NA	No	BSL	
	Semivolatile Organic Compounds															
		BaP Equivalent	207.55	264.62	ug/kg	03SS0101	3/10	360 - 450	264.62	NA	410 MCL	NA	NA	No	BSL	
	56-55-3	Benzo(a)anthracene	84 J	170 J	ug/kg	03SS0901	3/10	360 - 450	170	NA	160 MCL	NA	NA	Yes	ASL	
	50-32-8	Benzo(a)pyrene	170 J	210 J	ug/kg	03SS0101	3/10	360 - 450	210	NA	410 MCL	NA	NA	No	BSL	
	205-99-2	Benzo(b)fluoranthene	270 J	360 J	ug/kg	03SS0101	3/10	360 - 450	360	NA	490 MCL ⁽⁷⁾	NA	NA	No	BSL	
	191-24-2	Benzo(g,h,i)perylene	100 J	100 J	ug/kg	03SS0901	1/10	360 - 450	100	NA	NA	NA	NA	No	NTX	
	207-08-9	Benzo(k)fluoranthene	200 J	240 J	ug/kg	03SS0101, 03SS0901	3/10	360 - 450	240	NA	490 MCL ⁽⁷⁾	NA	NA	No	BSL	
	117-81-7	Bis(2-ethylhexyl)phthalate	52 J	280 J	ug/kg	03SS0901	6/10	370 - 450	280	NA	180000 MCL	NA	NA	No	BSL	
105-60-2	Caprolactam	170 J	260 J	ug/kg	03SS0301	2/10	360 - 430	260	NA	3900 N	NA	NA	No	BSL		
218-01-9	Chrysene	150 J	230 J	ug/kg	03SS0901	3/10	360 - 450	230	NA	160 MCL	NA	NA	Yes	ASL		
206-44-0	Fluoranthene	73 J	160 J	ug/kg	03SS0101	3/10	360 - 450	160	NA	310000 N	NA	NA	No	BSL		
129-00-0	Pyrene	140 J	370 J	ug/kg	03SS0101	3/10	360 - 450	370	NA	230000 N	NA	NA	No	BSL		
Pesticides/PCBs																
72-54-8	4,4'-DDD	0.73 J	3.3 J	ug/kg	03SS1001	4/10	0.56 - 0.72	3.3	NA	710 C	NA	NA	No	BSL		
72-55-9	4,4'-DDE	0.73 J	4.9	ug/kg	03SS0101	4/10	0.56 - 0.72	4.9	NA	2200 C	NA	NA	No	BSL		
50-29-3	4,4'-DDT	0.29 J	17 J	ug/kg	03SS1001	5/10	0.58 - 0.72	17	NA	1300 C	NA	NA	No	BSL		
309-00-2	Aldrin	0.31 J	0.66 J	ug/kg	03SS1001	2/10	0.28 - 0.36	0.66	NA	25 C	NA	NA	No	BSL		
319-84-6	alpha-BHC	0.22 J	0.68 J	ug/kg	03SS0701	4/10	0.28 - 0.36	0.68	NA	0.036 C	NA	NA	Yes	ASL		
5103-71-9	alpha-Chlordane	0.14 J	26 J	ug/kg	03SS0901	7/10	0.29 - 0.36	26	NA	480 MCL ⁽⁸⁾	NA	NA	No	BSL		
319-85-7	beta-BHC	0.11 J	0.19 J	ug/kg	03SS0201	3/10	0.29 - 0.36	0.19	NA	0.13 C	NA	NA	Yes	ASL		
60-57-1	Dieldrin	0.17 J	3.7 J	ug/kg	03SS0701	6/10	0.58 - 0.72	3.7	NA	0.23 C	NA	NA	Yes	ASL		
33213-65-9	Endosulfan II	0.28 J	1.5 J	ug/kg	03SS0901	4/10	0.56 - 0.72	1.5	NA	980 N	NA	NA	No	BSL		
1031-07-8	Endosulfan Sulfate	2.1 J	2.1 J	ug/kg	03SS0901	1/10	0.56 - 0.72	2.1	NA	980 N	NA	NA	No	BSL		
72-20-8	Endrin	0.62 J	0.62 J	ug/kg	03SS1001	1/10	0.56 - 0.72	0.62	NA	50 MCL	NA	NA	No	BSL		
7421-93-4	Endrin Aldehyde	0.18 J	0.45 J	ug/kg	03SS0101	2/10	0.56 - 0.72	0.45	NA	50 MCL ⁽⁹⁾	NA	NA	No	BSL		
58-89-9	gamma-BHC (Lindane)	0.45 J	1.2 J	ug/kg	03SS0301	5/10	0.29 - 0.32	1.2	NA	0.47 MCL	NA	NA	Yes	ASL		
5103-74-2	gamma-Chlordane	0.098 J	14 J	ug/kg	03SS0901	6/10	0.28 - 0.36	14	NA	480 MCL ⁽⁸⁾	NA	NA	No	BSL		
1024-57-3	Heptachlor Epoxide	0.23 J	0.47 J	ug/kg	03SS0101	3/10	0.28 - 0.36	0.47	NA	33 MCL	NA	NA	No	BSL		
Herbicides																
88-85-7	Dinoseb	14 J	14 J	ug/kg	03SS1001	1/10	13 - 17	14	NA	19 MCL	NA	NA	No	BSL		
Inorganics																
7429-90-5	Aluminum	2670	7300	mg/kg	03SS0701	10/10	-	7300	NA	8.3 N	NA	NA	Yes	ASL		
7440-36-0	Antimony	1.2 J	1.2 J	mg/kg	03SS0901	1/10	0.99 - 1.2	1.2	NA	0.27 MCL	NA	NA	Yes	ASL		
7440-38-2	Arsenic	1.1	6	mg/kg	03SS0901	10/10	-	6	NA	290 MCL	NA	NA	No	BSL		
7440-39-3	Barium	6.7	23.2	mg/kg	03SS0901	10/10	-	23.2	NA	82 MCL	NA	NA	No	BSL		
7440-43-9	Cadmium	0.91	0.91	mg/kg	03SS0901	1/10	0.2 - 0.25	0.91	NA	0.38 MCL	NA	NA	Yes	ASL		
7440-70-2	Calcium	497 J	4560 J	mg/kg	03SS0501	6/10	204 - 246	4560	NA	NA	NA	NA	No	NTU		
7440-47-3	Chromium	2.8 J	10.6 J	mg/kg	03SS0901	10/10	-	10.6	NA	2.1 N	NA	NA	Yes	ASL		
7440-48-4	Cobalt	1.1	2.1	mg/kg	03SS1001D	3/10	0.99 - 1.2	2.1	NA	0.17 N	NA	NA	Yes	ASL		
7440-50-8	Copper	1.3	15.2	mg/kg	03SS0901	5/10	0.99 - 1.2	15.2	NA	560 MCL	NA	NA	No	BSL		
7439-89-6	Iron	2560 J	12900 J	mg/kg	03SS0401	10/10	-	12900	NA	NA	NA	NA	No	NTX		
7439-92-1	Lead	2.6 J	59.3 J	mg/kg	03SS0901	10/10	-	59.3	NA	NA	NA	NA	No	NTX		
7439-95-4	Magnesium	277 J	1080 J	mg/kg	03SS0901	2/10	197 - 246	1080	NA	NA	NA	NA	No	NTU		
7439-96-5	Manganese	1.9 J	44.2 J	mg/kg	03SS0901	10/10	-	44.2	NA	110 N	NA	NA	No	BSL		
7439-97-6	Mercury	0.014	0.08	mg/kg	03SS0701	5/10	0.013 - 0.015	0.08	NA	0.1 MCL	NA	NA	No	BSL		
7440-02-0	Nickel	1.4	8	mg/kg	03SS0901	7/10	1 - 1.2	8	NA	14 N	NA	NA	No	BSL		
7782-49-2	Selenium	0.68	0.68	mg/kg	03SS0401	1/10	0.61 - 0.74	0.68	NA	0.26 MCL	NA	NA	Yes	ASL		
7440-62-2	Vanadium	5.1	18.8	mg/kg	03SS0401	10/10	-	18.8	NA	260 N	NA	NA	No	BSL		
7440-66-6	Zinc	1.7 J	255 J	mg/kg	03SS0901	10/10	-	255	NA	680 N	NA	NA	No	BSL		
Miscellaneous Parameters																
57-12-5	Cyanide	0.14	0.14	mg/kg	03SS0601	1/10	0.13 - 0.17	0.14	NA	2 MCL	NA	NA	No	BSL		

TABLE 2.2
 OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
 NCBC GULFPORT
 GULFPORT, MISSISSIPPI
 PAGE 2 OF 2

Scenario Timeframe: Medium: Surface Soil Exposure Medium: Surface Soil
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Exposure Point	CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	USEPA SSL Soil to Groundwater ⁽⁵⁾	Potential ARAR/TBC	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁶⁾
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Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
- 2 - Values presented are sample-specific quantitation limits.
- 3 - The maximum detected concentration is used for screening purposes.
- 4 - To determine whether chemical concentrations were within background levels, a statistical analysis was conducted using the site and background datasets.
- 5 - EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm.
- 6 - Migration to groundwater values are based on a dilution attenuation factor (DAF) of 1.
- 7 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
- 8 - SSL is based on the MCL for benzo(a)pyrene.
- 9 - Chlordane is used as a surrogate for alpha- and gamma-chlordane.
- 9 - Endrin is used as a surrogate for Endrin Aldehyde.

Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples

- 03SS0101
- 03SS0201
- 03SS0301
- 03SS0401
- 03SS0501
- 03SS0601
- 03SS0701
- 03SS0801
- 03SS0901
- 03SS1001
- 03SS1001D

Definitions:

- ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
- C = Carcinogen
- COPC = Chemical Of Potential Concern
- J = Estimated value
- MCL = Maximum contaminant level
- N = Noncarcinogen
- NA = Not Applicable/Not Available

Rationale Codes:

- For selection as a COPC:
 - ASL = Above Screening Level and site background.
- For elimination as a COPC:
 - BSL = Below COPC Screening Level
 - NUT = Essential nutrient
 - NTX = No toxicity criteria

**TABLE 2.3
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - DIRECT CONTACT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Scenario Timeframe:
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TARs Unrestricted Value ⁽⁵⁾	MDEQ TARs Restricted Value ⁽⁵⁾	USEPA Region IX PRGs Residential ⁽⁶⁾	USEPA SSLs Soil to Air ⁽⁷⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁸⁾	
Site 3	Volatile Organic Compounds																
	78-93-3	2-Butanone	1.9 J	1.9 J	ug/kg	03SB0701	1/10	1.3 - 1.6	1.9	NA	8450 N	8450 N	2200000 N	2400000 sat	No	BSL	
	108-10-1	4-Methyl-2-Pentanone	1.1 J	1.1 J	ug/kg	03SB0701	1/10	0.54 - 0.66	1.1	NA	626000 N	16300000 N	530000 N	2700000 sat	No	BSL	
	75-15-0	Carbon Disulfide	6	6	ug/kg	03SB0601	1/10	1.2 - 1.5	6	NA	797 N	797 N	36000 N	720000 sat	No	BSL	
	156-59-2	cis-1,2-Dichloroethene	3.2 J	3.2 J	ug/kg	03SB0601	1/10	1.1 - 1.4	3.2	NA	78200 N	1210000 sat	4300 N	NA	No	BSL	
	75-01-4	Vinyl Chloride	3.7 J	3.7 J	ug/kg	03SB0301	1/10	1 - 1.3	3.7	NA	426 C	939 C	79 C	280 C	No	BSL	
	Semivolatile Organic Compounds																
	117-81-7	Bis(2-ethylhexyl)phthalate	480	480	ug/kg	03SB0701	1/10	41 - 45	480	NA	45600 C	409000 C	35000 C	NA	No	BSL	
	218-01-9	Chrysene	46 J	46 J	ug/kg	03SB0201	1/10	35 - 38	46	NA	87500 C	784000 C	15000 C ⁽⁹⁾	NA	No	BSL	
	Pesticides/PCBs																
	72-54-8	4,4'-DDD	1	1.2	ug/kg	03SB0301	2/10	0.15 - 0.16	1.2	NA	2660 C	23800 C	2400 C	NA	No	BSL	
	72-55-9	4,4'-DDE	0.34 J	0.53 J	ug/kg	03SB0301	2/10	0.15 - 0.16	0.53	NA	1880 C	16800 C	1700 C	NA	No	BSL	
	50-29-3	4,4'-DDT	0.23 J	1.7 J	ug/kg	03SB0101	4/10	0.15 - 0.16	1.7	NA	1880 C	16800 C	1700 C	750000 C	No	BSL	
	319-85-7	beta-BHC	0.32 J	2.1	ug/kg	03SB1001	4/10	0.098 - 0.11	2.1	NA	355 C	3180 C	320 C	6000 C	No	BSL	
	58-89-9	gamma-BHC (Lindane)	0.41	0.6 J	ug/kg	03SB0301	2/10	0.097 - 0.11	0.6	NA	491 C	4400 C	440 C	NA	No	BSL	
	5103-74-2	gamma-Chlordane	0.2 J	0.49	ug/kg	03SB0101	4/10	0.098 - 0.11	0.49	NA	1820 C ⁽¹⁰⁾	12300 C ⁽¹⁰⁾	1600 C ⁽¹⁰⁾	72000 C	No	BSL	
	76-44-8	Heptachlor	0.55	0.55	ug/kg	03SB1001	1/10	0.097 - 0.11	0.55	NA	127 C	195 C	110 C	4100 C	No	BSL	
	1024-57-3	Heptachlor Epoxide	0.23 J	0.78	ug/kg	03SB1001	3/10	0.098 - 0.11	0.78	NA	70.2 C	629 C	53 C	4700 C	No	BSL	
	Inorganics																
	7429-90-5	Aluminum	443	7280	mg/kg	03SB0801	10/10	-	7280	NA	7820 N	204000 N	7500 N ⁽⁹⁾	709000 N	No	BSL	
	7440-38-2	Arsenic	0.79	2.4	mg/kg	03SB0401	2/10	0.61 - 0.75	2.4	NA	0.426 C	3.82 C	0.39 C	769 C	Yes	ASL	
	7440-39-3	Barium	2.5	24.1	mg/kg	03SB0401	10/10	-	24.1	NA	548 N	1430 N	1500 N ⁽⁹⁾	70900 N	No	BSL	
	7440-70-2	Calcium	260 J	378	mg/kg	03SB0301	2/10	204 - 251	378	NA	NA	NA	NA	NA	No	NUT	
	7440-47-3	Chromium	1	7.5	mg/kg	03SB0401	10/10	-	7.5	NA	227 C ⁽¹¹⁾	381 C ⁽¹¹⁾	30 C	276 C	No	BSL	
	7440-50-8	Copper	1.3	1.3	mg/kg	03SB0401	1/10	1 - 1.3	1.3	NA	313 N	817 N	310 N	NA	No	BSL	
	7439-89-6	Iron	107	6640	mg/kg	03SB0401	10/10	-	6640	NA	2350 N	61300 N	5500 N	NA	Yes	ASL	
	7439-92-1	Lead	2.2	5.9	mg/kg	03SB0301	5/10	1 - 2.1	5.9	NA	400	1700 C	400	NA	No	BSL	
	7439-95-4	Magnesium	238	238	mg/kg	03SB0401	1/10	204 - 251	238	NA	NA	NA	NA	NA	No	NUT	
	7439-96-5	Manganese	0.74	4.4	mg/kg	03SB0401	10/10	-	4.4	NA	156 N	408 N	180 N	7090 N	No	BSL	
	7439-97-6	Mercury	0.024	0.024	mg/kg	03SB0301	1/10	0.013 - 0.017	0.024	NA	1 N	6.13 N	2.3 N	NA	No	BSL	
	7440-02-0	Nickel	1.3	1.3	mg/kg	03SB0801	1/10	1 - 1.3	1.3	NA	156 N	408 N	160 N	NA	No	BSL	
	7440-62-2	Vanadium	2	13.8	mg/kg	03SB0401	7/10	1 - 1.2	13.8	NA	54.8 N	143 N	7.3 N	NA	Yes	ASL	
	7440-66-6	Zinc	1.2	7.7	mg/kg	03SB0301	6/10	1 - 1.3	7.7	NA	2350 N	6130 N	2300 N	NA	No	BSL	

Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
- 2 - Values presented are sample-specific quantitation limits.
- 3 - The maximum detected concentration is used for screening purposes.
- 4 - No background soil samples were collected.
- 5 - Mississippi Department of Environmental Quality (MDEQ), Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites for Unrestricted and Restricted Land Use, February 2002. Noncarcinogenic values are divided by 10.
- 6 - USEPA Region IX Preliminary Remediation Goal (PRG). The noncarcinogenic values (denoted with a "N" flag) are the PRG divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag) (USEPA Region IX, October 2004, Updated December 28, 2004).
- 7 - EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm. Noncarcinogenic values are divided by 10.
- 8 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
- 9 - The toxicity criteria in the October 2004 PRG table is outdated. Value was updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table.
- 10 - Chlordane is used as a surrogate for gamma-chlordane.
- 11 - Values are for hexavalent chromium.

Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples

03SB0101
03SB0201
03SB0301
03SB0401
03SB0501
03SB0601
03SB0701
03SB0801
03SB0901
03SB0901-D
03SB1001

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
C = Carcinogen
COPC = Chemical Of Potential Concern
J = Estimated value
N = Noncarcinogen
NA = Not Applicable/Not Available
sat = soil saturation concentration

Rationale Codes:

For selection as a COPC:
ASL = Above Screening Level and site background.

For elimination as a COPC:
BSL = Below COPC Screening Level
NUT = Essential nutrient
NTX = No toxicity criteria

**TABLE 2.4
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN - MIGRATION PATHWAYS
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Scenario Timeframe:
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	USEPA SSL Soil to Groundwater ⁽⁵⁾	Potential ARAR/TBC	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁶⁾	
Site 3	Volatiles Organic Compounds															
	78-93-3	2-Butanone	1.9 J	1.9 J	ug/kg	03SB0701	1/10	1.3 - 1.6	1.9	NA	4400 N	NA	NA	No	BSL	
	108-10-1	4-Methyl-2-Pentanone	1.1 J	1.1 J	ug/kg	03SB0701	1/10	0.54 - 0.66	1.1	NA	620 N	NA	NA	No	BSL	
	75-15-0	Carbon Disulfide	6	6	ug/kg	03SB0601	1/10	1.2 - 1.5	6	NA	1500 N	NA	NA	No	BSL	
	156-59-2	cis-1,2-Dichloroethene	3.2 J	3.2 J	ug/kg	03SB0601	1/10	1.1 - 1.4	3.2	NA	20 MCL	NA	NA	No	BSL	
	75-01-4	Vinyl Chloride	3.7 J	3.7 J	ug/kg	03SB0301	1/10	1 - 1.3	3.7	NA	0.67 MCL	NA	NA	Yes	ASL	
	Semivolatile Organic Compounds															
	117-81-7	Bis(2-ethylhexyl)phthalate	480	480	ug/kg	03SB0701	1/10	41 - 45	480	NA	180000 MCL	NA	NA	No	BSL	
	218-01-9	Chrysene	46 J	46 J	ug/kg	03SB0201	1/10	35 - 38	46	NA	160 MCL	NA	NA	No	BSL	
	Pesticides/PCBs															
	72-54-8	4,4'-DDD	1	1.2	ug/kg	03SB0301	2/10	0.15 - 0.16	1.2	NA	710 C	NA	NA	No	BSL	
	72-55-9	4,4'-DDE	0.34 J	0.53 J	ug/kg	03SB0301	2/10	0.15 - 0.16	0.53	NA	2200 C	NA	NA	No	BSL	
	50-29-3	4,4'-DDT	0.23 J	1.7 J	ug/kg	03SB0101	4/10	0.15 - 0.16	1.7	NA	1300 C	NA	NA	No	BSL	
	319-85-7	beta-BHC	0.32 J	2.1	ug/kg	03SB1001	4/10	0.098 - 0.11	2.1	NA	0.13 C	NA	NA	Yes	ASL	
	58-89-9	gamma-BHC (Lindane)	0.41	0.6 J	ug/kg	03SB0301	2/10	0.097 - 0.11	0.6	NA	0.47 MCL	NA	NA	Yes	ASL	
	5103-74-2	gamma-Chlordane	0.2 J	0.49	ug/kg	03SB0101	4/10	0.098 - 0.11	0.49	NA	480 MCL ⁽⁷⁾	NA	NA	No	BSL	
	76-44-8	Heptachlor	0.55	0.55	ug/kg	03SB1001	1/10	0.097 - 0.11	0.55	NA	1100 MCL	NA	NA	No	BSL	
	1024-57-3	Heptachlor Epoxide	0.23 J	0.78	ug/kg	03SB1001	3/10	0.098 - 0.11	0.78	NA	33 MCL	NA	NA	No	BSL	
	Inorganics															
	7429-90-5	Aluminum	443	7280	mg/kg	03SB0801	10/10	-	7280	NA	8.3 N	NA	NA	Yes	ASL	
	7440-38-2	Arsenic	0.79	2.4	mg/kg	03SB0401	2/10	0.61 - 0.75	2.4	NA	0.29 MCL	NA	NA	Yes	ASL	
	7440-39-3	Barium	2.5	24.1	mg/kg	03SB0401	10/10	-	24.1	NA	8.2 MCL	NA	NA	Yes	ASL	
	7440-70-2	Calcium	260 J	378	mg/kg	03SB0301	2/10	204 - 251	378	NA	NA	NA	NA	No	NUT	
	7440-47-3	Chromium	1	7.5	mg/kg	03SB0401	10/10	-	7.5	NA	2.1 N	NA	NA	Yes	ASL	
	7440-50-8	Copper	1.3	1.3	mg/kg	03SB0401	1/10	1 - 1.3	1.3	NA	560 MCL	NA	NA	No	BSL	
	7439-89-6	Iron	107	6640	mg/kg	03SB0401	10/10	-	6640	NA	NA	NA	NA	No	NTX	
	7439-92-1	Lead	2.2	5.9	mg/kg	03SB0301	5/10	1 - 2.1	5.9	NA	NA	NA	NA	No	NTX	
	7439-95-4	Magnesium	238	238	mg/kg	03SB0401	1/10	204 - 251	238	NA	NA	NA	NA	No	NUT	
	7439-96-5	Manganese	0.74	4.4	mg/kg	03SB0401	10/10	-	4.4	NA	110 N	NA	NA	No	BSL	
	7439-97-6	Mercury	0.024	0.024	mg/kg	03SB0301	1/10	0.013 - 0.017	0.024	NA	0.1 MCL	NA	NA	No	BSL	
	7440-02-0	Nickel	1.3	1.3	mg/kg	03SB0801	1/10	1 - 1.3	1.3	NA	14 N	NA	NA	No	BSL	
	7440-62-2	Vanadium	2	13.8	mg/kg	03SB0401	7/10	1 - 1.2	13.8	NA	260 N	NA	NA	No	BSL	
	7440-66-6	Zinc	1.2	7.7	mg/kg	03SB0301	6/10	1 - 1.3	7.7	NA	680 N	NA	NA	No	BSL	

Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
 - 2 - Values presented are sample-specific quantitation limits.
 - 3 - The maximum detected concentration is used for screening purposes.
 - 4 - To determine whether chemical concentrations were within background levels, a statistical analysis was conducted using the site and background datasets.
 - 5 - EPA Soil Screening Levels. EPA Internet Site at http://risk.lsd.ornl.gov/calc_start.htm.
Migration to groundwater values are based on a dilution attenuation factor (DAF) of 1.
 - 6 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
 - 7 - Chlordane is used as a surrogate for gamma-chlordane.
- Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples

03SB0101
03SB0201
03SB0301
03SB0401
03SB0501
03SB0601
03SB0701
03SB0801
03SB0901
03SB0901-D
03SB1001

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
C = Carcinogen
COPC = Chemical Of Potential Concern
J = Estimated value
MCL = Maximum contaminant level
N = Noncarcinogen
NA = Not Applicable/Not Available

Rationale Codes:

For selection as a COPC:
ASL = Above Screening Level and site background.

For elimination as a COPC:
BSL = Below COPC Screening Level
NUT = Essential nutrient
NTX = No toxicity criteria

**TABLE 2.5
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
NCBC GULFPORT
GULFPORT, MISSISSIPPI
PAGE 1 OF 2**

Scenario Timeframe:
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TRGs ⁽⁵⁾	USEPA Region IX PRG Tap Water ⁽⁶⁾	USEPA MCL ⁽⁷⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁸⁾	
Site 3	Volatile Organic Compounds															
	75-35-4	1,1-Dichloroethene	0.7 J	2.2	ug/L	03GP1803	2/105	0.13 - 10	2.2	NA	7 MCL	34 N	7	No	BSL	
	120-82-1	1,2,4-Trichlorobenzene	1.2	1.2	ug/L	03GP0201	1/95	0.14 - 10	1.2	NA	70 MCL	0.72 N	70	Yes	ASL	
	107-06-2	1,2-Dichloroethane	1.4	1.6	ug/L	03GP0201, 03GP0202	3/105	0.13 - 10	1.6	NA	5 MCL	0.12 C	5	Yes	ASL	
	67-64-1	Acetone	13.9	13.9	ug/L	GPT-03-16GW-001	1/105	1.1 - 1000	13.9	NA	60.8 N	550 N	NA	No	BSL	
	71-43-2	Benzene	0.14 J	12	ug/L	03GP0301	10/105	0.11 - 10	12	NA	5 MCL	0.35 C	5	Yes	ASL	
	108-90-7	Chlorobenzene	1.1	1.1	ug/L	03GP1103, 03GP1803	2/105	0.1 - 10	1.1	NA	100 MCL	9 N ⁽⁹⁾	100	No	BSL	
	74-87-3	Chloromethane	10 J	10 J	ug/L	GPT-03-26GW-001	1/105	0.28 - 10	10	NA	1.43 C	16 N	NA	No	ASL	
	156-59-2	cis-1,2-Dichloroethene	0.87 J	880	ug/L	GPT-03-23GW-001	40/105	0.14 - 5	880	NA	70 MCL	6.1 N	70	Yes	ASL	
	110-82-7	Cyclohexane	1 J	1 J	ug/L	GPT-03-26GW-001	1/14	0.12 - 1.2	1	NA	NA	1000 N	NA	No	BSL	
	108-87-2	Methyl Cyclohexane	2.1 J	2.2	ug/L	GPT-03-26GW-001	2/14	0.12 - 1.2	2.2	NA	NA	520 N	NA	No	BSL	
	75-09-2	Methylene Chloride	12 J	14 J	ug/L	GPT-03-23GW-001	2/105	0.23 - 10	14	NA	5 MCL	4.3 C	5	Yes	ASL	
	156-60-5	trans-1,2-Dichloroethene	0.16 J	87.4	ug/L	03GP0202	18/105	0.15 - 10	87.4	NA	100 MCL	11 N	100	Yes	ASL	
	79-01-6	Trichloroethene	0.3 J	300	ug/L	GPT-03-21GW-001	22/105	0.23 - 10	300	NA	5 MCL	0.028 C	5	Yes	ASL	
	75-01-4	Vinyl Chloride	0.34 J	150	ug/L	03GP0301	31/105	0.19 - 10	150	NA	2 MCL	0.02 C	2	Yes	ASL	
	Semivolatile Organic Compounds															
	121-14-2	2,4-Dinitrotoluene		0.63 J	0.63 J	ug/L	GPT-03-10GW-001	1/24	0.46 - 5	0.63	NA	7.3 N	7.3 N	NA	No	BSL
	105-60-2	Caprolactam		0.47 J	0.47 J	ug/L	GPT-03-20GW-001	1/24	0.34 - 5	0.47	NA	1830 N	1800 N	NA	No	BSL
	Inorganics															
	7429-90-5	Aluminum		59.1 J	58900	ug/L	GPT-03-17GW-001	23/24	50 - 50	58900	NA	3650 N	3600 N	NA	Yes	ASL
	7440-38-2	Arsenic		10.6	287	ug/L	GPT-03-11GW-001	10/24	3 - 10	287	NA	50 MCL	0.045 C	10	Yes	ASL
	7440-39-3	Barium		28	378	ug/L	GPT-03-31GW-001-D	24/24	- - -	378	NA	2000 MCL	730 N ⁽⁹⁾	2000	No	BSL
	7440-41-7	Beryllium		1.1	2.1	ug/L	GPT-03-17GW-001	3/24	1 - 1	2.1	NA	4 MCL	7.3 N	4	No	BSL
	7440-70-2	Calcium		2610	88400	ug/L	GPT-03-16GW-001	24/24	- - -	88400	NA	NA	NA	NA	No	NUT
	15723-28-1	Chromium		2.2	53.3	ug/L	GPT-03-17GW-001	13/24	2 - 2	53.3	NA	100	11 N	100	Yes	ASL
	7440-48-4	Cobalt		5.2	5.2	ug/L	GPT-03-08GW-001	1/24	5 - 5	5.2	NA	219 N	73 N	NA	No	BSL
	7440-50-8	Copper		13.7	13.7	ug/L	GPT-03-17GW-001	1/24	5 - 5	13.7	NA	1300 MCL	150 N	1300	No	BSL
	7439-89-6	Iron		2660	33500	ug/L	GPT-03-26GW-001	24/24	- - -	33500	NA	1100 N	2600 N	NA	Yes	ASL
	7439-92-1	Lead		1.6	19.4	ug/L	GPT-03-17GW-001	8/24	1.5 - 1.5	19.4	NA	15 MCL	NA	15	Yes	ASL
	7439-95-4	Magnesium		1230	8510	ug/L	GPT-03-16GW-001	24/24	- - -	8510	NA	NA	NA	NA	No	NUT
	7439-96-5	Manganese		31.8	235	ug/L	GPT-03-31GW-001-D	24/24	- - -	235	NA	73 N	88 N	NA	Yes	ASL
	7439-97-6	Mercury		0.18 J	0.18 J	ug/L	GPT-03-17GW-001	1/24	0.08 - 0.089	0.18	NA	2 MCL	1.1 N	2	No	BSL
	7440-02-0	Nickel		5.4	18.9	ug/L	GPT-03-17GW-001	5/24	5 - 5	18.9	NA	73 N	73 N	NA	No	BSL
	7440-09-7	Potassium		1250	5450	ug/L	GPT-03-31GW-001-D	21/24	1000 - 1000	5450	NA	NA	NA	NA	No	NUT
	7782-49-2	Selenium		8.2	8.2	ug/L	GPT-03-17GW-001	1/24	3 - 3	8.2	NA	50 MCL	18 N	50	No	BSL
	7440-23-5	Sodium		5350	63200	ug/L	GPT-03-22GW-001	24/24	- - -	63200	NA	NA	NA	NA	No	NUT
	7440-28-0	Thallium		3.7	3.7	ug/L	GPT-03-31GW-001	1/24	3 - 3.3	3.7	NA	2 MCL	0.24 N	2	No	FOD
	7440-62-2	Vanadium		5.3	78.2	ug/L	GPT-03-17GW-001	7/24	5 - 5	78.2	NA	25.6 N	3.6 N	NA	Yes	ASL
	7440-66-6	Zinc		5	41.7	ug/L	GPT-03-15GW-001	18/24	5 - 5	41.7	NA	1100 N	1100 N	NA	No	BSL

Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
- 2 - Values presented are sample-specific quantitation limits.
- 3 - The maximum detected concentration is used for screening purposes.
- 4 - To determine whether chemical concentrations were within background levels, a statistical analysis was conducted using the site and background datasets.
- 5 - Mississippi Department of Environmental Quality (MDEQ). Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites for Unrestricted and Restricted Land Use, February 2002. Noncarcinogenic values are divided by 10.
- 6 - USEPA Region IX Preliminary Remediation Goal (PRG). The noncarcinogenic values (denoted with a "N" flag) are the PRG divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag) (USEPA Region IX, October 2004, Updated December 28, 2004).
- 7 - USEPA Drinking Water Standards and Health Advisories, August 2006.
- 8 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
- 9 - The toxicity criteria in the October 2004 PRG table is outdated. Value was updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table. Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Definitions:

- C = Carcinogen
- COPC = Chemical Of Potential Concern
- J = Estimated value
- N = Noncarcinogen
- NA = Not Applicable/Not Available
- MCL = Maximum contaminant level.

TABLE 2.5
 OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
 NCBC GULFPORT
 GULFPORT, MISSISSIPPI
 PAGE 2 OF 2

Scenario Timeframe:
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TRGs ⁽⁵⁾	USEPA Region IX PRG Tap Water ⁽⁶⁾	USEPA MCL ⁽⁷⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁸⁾
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Associated Samples

03GP0101	03GP1402	GPT-03-13GW-001
03GP0102	03GP1403	GPT-03-13GW-001D
03GP0103	03GP1404	GPT-03-14GW-001
03GP0201	03GP1501	GPT-03-15GW-001
03GP0202	03GP1502	GPT-03-16GW-001
03GP0203	03GP1503	GPT-03-17GW-001
03GP0301	03GP1601	GPT-03-18GW-001
03GP0302	03GP1602	GPT-03-19GW-001
03GP0303	03GP1603	GPT-03-20GW-001
03GP0402	03GP1604	GPT-03-21GW-001
03GP0403	03GP1701	GPT-03-22GW-001
03GP0501	03GP1702	GPT-03-23GW-001
03GP0502	03GP1703	GPT-03-24GW-001
03GP0503	03GP1704	GPT-03-25GW-001
03GP0601	03GP1801	GPT-03-26GW-001
03GP0602	03GP1802	GPT-03-27GW-001
03GP0603	03GP1803	GPT-03-28GW-001
03GP0701	03GP1804	GPT-03-29GW-001
03GP0702	03GP1901	GPT-03-30GW-001
03GP0703	03GP1902	GPT-03-30GW-001-D
03GP0801	03GP1903	GPT-03-31GW-001
03GP0802	03GP1904	GPT-03-31GW-001-D
03GP0803	03GP2001	
03GP0804	03GP2002	
03GP0901	03GP2003	
03GP0902	03GP2004	
03GP0903	03GP2101	
03GP1001	03GP2102	
03GP1002	03GP2103	
03GP1003	03GP2104	
03GP1004	03GP2201	
03GP1101	03GP2202	
03GP1102	03GP2203	
03GP1103	03GP2204	
03GP1104	03GP2301	
03GP1201	03GP2302	
03GP1202	03GP2303	
03GP1203	03GP2304	
03GP1204	GPT-03-08GW-001	
03GP1301	GPT-03-09GW-001	
03GP1302	GPT-03-10GW-001	
03GP1303	GPT-03-11GW-001	
03GP1401	GPT-03-12GW-001	

Rationale Codes:

For selection as a COPC:
 ASL = Above Screening Level and site background.

For elimination as a COPC:
 BSL = Below COPC Screening Level
 FOD = Frequency of Detection
 NUT = Essential nutrient
 NTX = No toxicity criteria

**TABLE 2.6
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Scenario Timeframe:
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	USEPA Groundwater Volatilization Criteria ⁽⁵⁾	Potential ARAR/TBC	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁶⁾	
Site 3	Volatile Organic Compounds															
	75-35-4	1,1-Dichloroethene	0.7 J	2.2	ug/L	03GP1803	2/105	0.13 - 10	2.2	NA	190 N	NA	NA	No	BSL	
	120-82-1	1,2,4-Trichlorobenzene	1.2	1.2	ug/L	03GP0201	1/95	0.14 - 10	1.2	NA	3400 N	NA	NA	No	BSL	
	107-06-2	1,2-Dichloroethane	1.4	1.6	ug/L	03GP0201, 03GP0202	3/105	0.13 - 10	1.6	NA	5 MCL	NA	NA	No	BSL	
	67-64-1	Acetone	13.9	13.9	ug/L	GPT-03-16GW-001	1/105	1.1 - 1000	13.9	NA	220000 N	NA	NA	No	BSL	
	71-43-2	Benzene	0.14 J	12	ug/L	03GP0301	10/105	0.11 - 10	12	NA	5 MCL	NA	NA	Yes	ASL	
	108-90-7	Chlorobenzene	1.1	1.1	ug/L	03GP1103, 03GP1803	2/105	0.1 - 10	1.1	NA	390 N	NA	NA	No	BSL	
	74-87-3	Chloromethane	10 J	10 J	ug/L	GPT-03-26GW-001	1/105	0.28 - 10	10	NA	6.7 C	NA	NA	Yes	ASL	
	156-59-2	cis-1,2-Dichloroethene	0.87 J	880	ug/L	GPT-03-23GW-001	40/105	0.14 - 5	880	NA	210 N	NA	NA	Yes	ASL	
	110-82-7	Cyclohexane	1 J	1 J	ug/L	GPT-03-26GW-001	1/14	0.12 - 1.2	1	NA	NA	NA	NA	No	NTX	
	108-87-2	Methyl Cyclohexane	2.1 J	2.2	ug/L	GPT-03-26GW-001	2/14	0.12 - 1.2	2.2	NA	710 N	NA	NA	No	BSL	
	75-09-2	Methylene Chloride	12 J	14 J	ug/L	GPT-03-23GW-001	2/105	0.23 - 10	14	NA	58 C	NA	NA	No	BSL	
	156-60-5	trans-1,2-Dichloroethene	0.16 J	87.4	ug/L	03GP0202	18/105	0.15 - 10	87.4	NA	180 N	NA	NA	No	BSL	
	79-01-6	Trichloroethene	0.3 J	300	ug/L	GPT-03-21GW-001	22/105	0.23 - 10	300	NA	5 MCL	NA	NA	Yes	ASL	
	75-01-4	Vinyl Chloride	0.34 J	150	ug/L	03GP0301	31/105	0.19 - 10	150	NA	2 MCL	NA	NA	Yes	ASL	

Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
- 2 - Values presented are sample-specific quantitation limits.
- 3 - The maximum detected concentration is used for screening purposes.
- 4 - To determine whether chemical concentrations were within background levels, a statistical analysis was conducted using the site and background datasets.
- 5 - Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils. November 2002. EPA530-F-02-052.
Values are from Table 2c and correspond to a target cancer risk level of 1E-6 or HI =1 and an attenuation factor of 0.001.
- 6 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.

Shaded criterion indicates that the maximum detected concentration exceeds the screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Associated Samples

03GP0101	03GP0802	03GP1401	03GP1903	GPT-03-11GW-001	GPT-03-30GW-001-D
03GP0102	03GP0803	03GP1402	03GP1904	GPT-03-12GW-001	GPT-03-31GW-001
03GP0103	03GP0804	03GP1403	03GP2001	GPT-03-13GW-001	GPT-03-31GW-001-D
03GP0201	03GP0901	03GP1404	03GP2002	GPT-03-13GW-001-D	
03GP0202	03GP0902	03GP1501	03GP2003	GPT-03-14GW-001	
03GP0203	03GP0903	03GP1502	03GP2004	GPT-03-15GW-001	
03GP0301	03GP1001	03GP1503	03GP2101	GPT-03-16GW-001	
03GP0302	03GP1002	03GP1601	03GP2102	GPT-03-17GW-001	
03GP0303	03GP1003	03GP1602	03GP2103	GPT-03-18GW-001	
03GP0402	03GP1004	03GP1603	03GP2104	GPT-03-19GW-001	
03GP0403	03GP1101	03GP1604	03GP2201	GPT-03-20GW-001	
03GP0501	03GP1102	03GP1701	03GP2202	GPT-03-21GW-001	
03GP0502	03GP1103	03GP1702	03GP2203	GPT-03-22GW-001	
03GP0503	03GP1104	03GP1703	03GP2204	GPT-03-23GW-001	
03GP0601	03GP1201	03GP1704	03GP2301	GPT-03-24GW-001	
03GP0602	03GP1202	03GP1801	03GP2302	GPT-03-25GW-001	
03GP0603	03GP1203	03GP1802	03GP2303	GPT-03-26GW-001	
03GP0701	03GP1204	03GP1803	03GP2304	GPT-03-27GW-001	
03GP0702	03GP1301	03GP1804	GPT-03-08GW-001	GPT-03-28GW-001	
03GP0703	03GP1302	03GP1901	GPT-03-09GW-001	GPT-03-29GW-001	
03GP0801	03GP1303	03GP1902	GPT-03-10GW-001	GPT-03-30GW-001	

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
 C = Carcinogen
 COPC = Chemical Of Potential Concern
 J = Estimated value
 MCL = Maximum contaminant level
 N = Noncarcinogen
 NA = Not Applicable/Not Available

Rationale Codes:

For selection as a COPC:
 ASL = Above Screening Level and site background.

For elimination as a COPC:
 BSL = Below COPC Screening Level
 NUT = Essential nutrient
 NTX = No toxicity criteria

**TABLE 2.7
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Scenario Timeframe:
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	USEPA Region IX PRG Tap Water ⁽⁵⁾	MDEQ TRGs ⁽⁶⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁷⁾	
Site 3	Volatile Organic Compounds														
	67-64-1	Acetone	4 J	4 J	ug/L	03SW1501	1/8	5 - 5	4	5 - 8	550 N	60.8 N	No	BSL	
	Semivolatile Organic Compounds														
	117-81-7	Bis(2-ethylhexyl)phthalate	19	19	ug/L	03SW1501	1/8	10 - 10	19	11	4.8 C	6 MCL	Yes	ASL	
	Inorganics														
	7429-90-5	Aluminum	427	427	ug/L	03SW1501	1/8	21.2 - 398	427	442	3600 N	3650 N	No	BSL	
	7440-39-3	Barium	1.9	53.3	ug/L	03SW1501	8/8	-	53.3	20.5 - 51.9	730 N ⁽⁶⁾	2000 MCL	No	BSL	
	7440-70-2	Calcium	2680	22000	ug/L	03SW0501	8/8	-	22000	9740 - 12600	NA	NA	No	NUT	
	7440-50-8	Copper	13	15.5	ug/L	03SW1501	2/8	3.19 - 3.19	15.5	12.6 - 20.7	150 N	1300 MCL	No	BSL	
	7439-89-6	Iron	135	3680	ug/L	03SW0501	7/8	131 - 131	3680	696 - 2180	2600 N	1100 N	Yes	ASL	
	7439-92-1	Lead	1.9	1.9	ug/L	03SW0301, 03SW1501	2/8	1.8 - 1.8	1.9	1.9 - 3.4	NA	15 MCL	No	BSL	
	7439-95-4	Magnesium	1720	4150	ug/L	03SW0401	8/8	-	4150	2300 - 3000	NA	NA	No	NUT	
	7439-96-5	Manganese	8	98.2	ug/L	03SW0301	8/8	-	98.2	50.7 - 130	88 N	73 N	Yes	ASL	
	7440-09-7	Potassium	5520	6010	ug/L	03SW0601D	2/8	1570 - 3880	6010	5090	NA	NA	No	NUT	
	7782-49-2	Selenium	4.7	4.7	ug/L	03SW0601D	1/8	4.04 - 4.04	4.7	ND	18 N	50 MCL	No	BSL	
	7440-23-5	Sodium	13400	21600	ug/L	03SW0601	8/8	-	21600	11600 - 23500	NA	NA	No	NUT	
7440-66-6	Zinc	3.4	13.4	ug/L	03SW0301	7/8	3.22 - 3.22	13.4	5.8 - 9.6	1100 N	1100 N	No	BSL		

Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
 - 2 - Values presented are sample-specific quantitation limits.
 - 3 - The maximum detected concentration is used for screening purposes.
 - 4 - Samples 03SW1001, 03SW110, 03SW1201, 03SW1301, 03SW1401, and 03SW1601.
 - 5 - USEPA Region IX Preliminary Remediation Goal (PRG). The noncarcinogenic values (denoted with a "N" flag) are the PRG divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag). (USEPA Region IX, October 2004, Updated December 28, 2004).
 - 6 - Mississippi Department of Environmental Quality (MDEQ), Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites for Unrestricted and Restricted Land Use, February 2002. Noncarcinogenic values are divided by 10.
 - 7 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level.
 - 8 - The toxicity criteria in the October 2004 PRG table is outdated. Value was updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table.
- Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Definitions:

- C = Carcinogen
- COPC = Chemical Of Potential Concern
- J = Estimated value
- N = Noncarcinogen
- NA = Not Applicable/Not Available
- MCL = Maximum contaminant level.

Rationale Codes:

- For selection as a COPC:
- ASL = Above Screening Level and site background.

For elimination as a COPC:

- BSL = Below COPC Screening Level
- NUT = Essential nutrient
- NTX = No toxicity criteria

Associated Samples

- 03SW0101
- 03SW0201
- 03SW0301
- 03SW0401
- 03SW0501
- 03SW0601
- 03SW0601D
- 03SW0701
- 03SW1501

**TABLE 2.8
OCCURRENCE, DISTRIBUTION, AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Scenario Timeframe:
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	CAS Number	Chemical	Minimum Concentration ⁽¹⁾	Maximum Concentration ⁽¹⁾	Units	Sample of Maximum Concentration	Frequency of Detection	Range of Nondetects ⁽²⁾	Concentration Used for Screening ⁽³⁾	Range of Background Concentrations ⁽⁴⁾	MDEQ TARs Unrestricted Value ⁽⁵⁾	MDEQ TARs Restricted Value ⁽⁵⁾	USEPA Region IX PRGs Residential ⁽⁶⁾	COPC Flag	Rationale for Contaminant Deletion or Selection ⁽⁷⁾
Site 3	Volatile Organic Compounds														
	67-64-1	Acetone	18 J	160 J	ug/kg	03SD0801	9/10	75 - 75	160	21 - 290	782000 N	10400000 N	1400000 N	No	BSL
	75-15-0	Carbon Disulfide	7 J	7 J	ug/kg	03SD0401	1/10	5 - 10	7	3	797 N	797 N	36000 N	No	BSL
	Pesticides/PCBs														
	72-54-8	4,4'-DDD	1.7 J	3.1 J	ug/kg	03SD0201	3/10	3.8 - 5.6	3.1	ND	2660 C	23800 C	2400 C	No	BSL
	72-55-9	4,4'-DDE	1.4 J	3.7 J	ug/kg	03SD0101	4/10	3.8 - 4.7	3.7	ND	1880 C	16800 C	1700 C	No	BSL
	50-29-3	4,4'-DDT	4.4 J	9.8	ug/kg	03SD0101	3/10	3.8 - 4.7	9.8	ND	1880 C	16800 C	1700 C	No	BSL
	319-84-6	alpha-BHC	1.8 J	2.1 J	ug/kg	03SD0601D	2/10	2 - 2.9	2.1	1.5 - 1.9	101 C	908 C	90 C	No	BSL
	5103-71-9	alpha-Chlordane	2.2 J	3.3	ug/kg	03SD0601D	2/10	2 - 2.6	3.3	ND	1820 C ⁽⁸⁾	12300 C ⁽⁸⁾	1600 C ⁽⁸⁾	No	BSL
	11097-69-1	Aroclor-1254	35	86	ug/kg	03SD0101	3/10	20 - 26	86	ND	1000 C	10000 C	220 C ⁽⁹⁾	No	BSL
	11096-82-5	Aroclor-1260	32	130	ug/kg	03SD0101	4/10	20 - 24	130	ND	1000 C	10000 C	220 C ⁽⁹⁾	No	BSL
	319-86-8	delta-BHC	2 J	2 J	ug/kg	03SD0901	1/10	2 - 2.9	2	2.4	101 C ⁽¹⁰⁾	908 C ⁽¹⁰⁾	90 C ⁽¹⁰⁾	No	BSL
	60-57-1	Dieldrin	1.9 J	2.8 J	ug/kg	03SD0201	3/9	3.8 - 5	2.8	ND	39.9 C	358 C	30 C	No	BSL
	72-20-8	Endrin Ketone	3.2 J	3.2 J	ug/kg	03SD0101	1/10	3.8 - 5.6	3.2	2.8	2350 N ⁽¹¹⁾	6130 N ⁽¹¹⁾	1800 N ⁽¹¹⁾	No	BSL
	58-89-9	gamma-BHC (Lindane)	2 J	2 J	ug/kg	03SD0201	1/10	2 - 2.9	2	2.3	491 C	4400 C	440 C	No	BSL
	5103-74-2	gamma-Chlordane	1.5 J	2.1 J	ug/kg	03SD0601D	2/10	2 - 2.6	2.1	ND	1820 C ⁽⁸⁾	12300 C ⁽⁸⁾	1600 C ⁽⁸⁾	No	BSL
		Total Aroclor	56	216	ug/kg	03SD0101	4/10	20 - 24	216	ND	1000 C	10000 C	220 C ⁽⁹⁾	No	BSL
	Inorganics														
	7429-90-5	Aluminum	713	15600	mg/kg	03SD0401	10/10	-	15600	1640 - 9090	7820 N	204000 N	7500 N	Yes	ASL
	7440-38-2	Arsenic	2.9	13.2	mg/kg	03SD0301	6/10	0.28 - 1.4	13.2	3.7 - 4.6	0.426 C	3.82 C	0.39 C	Yes	ASL
	7440-39-3	Barium	1.7	38.3	mg/kg	03SD0101	10/10	-	38.3	3.4 - 30.2	548 N	1430 N	1500 N ⁽¹²⁾	No	BSL
	7440-70-2	Calcium	74.4	892	mg/kg	03SD0401	8/10	18.8 - 23.9	892	112 - 628	NA	NA	NA	No	NUT
	7440-47-3	Chromium	1.4	17.1	mg/kg	03SD0401	10/10	-	17.1	2.7 - 10	227 C ⁽¹³⁾	450 C ⁽¹³⁾	30 C	No	BSL
	7440-48-4	Cobalt	0.84	2	mg/kg	03SD0101	5/10	0.11 - 0.95	2	1.3	469 N	1230 N	140 N ⁽¹⁴⁾	No	BSL
	7440-50-8	Copper	2.3	9.3	mg/kg	03SD0401	7/10	0.9 - 1.9	9.3	4.1	313 N	817 N	310 N	No	BSL
	7439-89-6	Iron	579	12000	mg/kg	03SD0401	10/10	-	12000	1010 - 10200	2350 N	61300 N	5500 N	Yes	ASL
	7439-92-1	Lead	2.6	22	mg/kg	03SD0401	9/10	0.71 - 0.71	22	1.9 - 12.8	400	1700	400	No	BSL
7439-95-4	Magnesium	33.2	568	mg/kg	03SD0401	10/10	-	568	76.3 - 377	NA	NA	NA	No	NUT	
7439-96-5	Manganese	1.7	33.4	mg/kg	03SD0101	10/10	-	33.4	2.9 - 11.8	156 N	408 N	180 N	No	BSL	
7439-97-6	Mercury	0.01	0.07	mg/kg	03SD0401	6/10	0.01 - 0.01	0.07	0.02	1 N	6.13 N	2.3 N	No	BSL	
7440-02-0	Nickel	3	6.2	mg/kg	03SD0401	6/10	0.87 - 1.7	6.2	4.2	156 N	408 N	160 N	No	BSL	
7440-23-5	Sodium	37.4	39	mg/kg	03SD0101	2/10	4.8 - 23.2	39	ND	NA	NA	NA	No	NUT	
7440-62-2	Vanadium	1.3	25.4	mg/kg	03SD0401	10/10	-	25.4	2.9 - 13.8	54.8 N	143 N	7.8 N	Yes	ASL	
7440-66-6	Zinc	1.3	57.5	mg/kg	03SD0401	10/10	-	57.5	1.8 - 33	2350 N	6130 N	2300 N	No	BSL	

Footnotes:

- 1 - Sample and duplicate are considered as two separate samples when determining the minimum and maximum concentrations.
 - 2 - Values presented are sample-specific quantitation limits.
 - 3 - The maximum detected concentration is used for screening purposes.
 - 4 - Samples 03SD1001, 03SD1101, 03SD1201, 03SD1301, 03SD1401, and 03SD1601.
 - 5 - Mississippi Department of Environmental Quality (MDEQ), Risk Evaluation Procedures for Voluntary Cleanup and Redevelopment of Brownfield Sites for Unrestricted and Restricted Land Use, February 2002. Noncarcinogenic values are divided by 10.
 - 6 - USEPA Region IX Preliminary Remediation Goal (PRG). The noncarcinogenic values (denoted with a "N" flag) are the PRG divided by 10 to correspond to a target hazard quotient of 0.1. Carcinogenic values represent an incremental cancer risk of 1.0E-06 (carcinogens denoted with a "C" flag) (USEPA Region IX, October 2004, Updated December 28, 2004).
 - 7 - The chemical is selected as a COPC if the maximum detected concentration exceeds the risk-based COPC screening level and is statistically determined to be greater than site background.
 - 8 - Chlordane is used as a surrogate for alpha- and gamma-chlordane.
 - 9 - The values for Total PCBs is presented.
 - 10 - alpha-BHC is used as a surrogate for delta-BHC.
 - 11 - Endrin is used as a surrogate for Endrin Aldehyde and Endrin Ketone.
 - 12 - The toxicity criteria in the October 2004 PRG table is outdated. Value was updated using toxicity criteria from the October 2007 USEPA Region 3 RBC Table.
 - 13 - Values are for hexavalent chromium.
 - 14 - One tenth of the noncarcinogenic PRG is less than the carcinogenic PRG, therefore the one tenth noncarcinogenic PRG is presented.
- Shaded criterion indicates that the maximum detected concentration exceeds one or more screening criteria. Shaded chemical name indicates that the chemical was retained as a COPC.

Definitions:

ARAR/TBC = Applicable or Relevant and Appropriate Requirements To Be Considered
 C = Carcinogen
 COPC = Chemical Of Potential Concern
 J = Estimated value
 N = Noncarcinogen
 NA = Not Applicable/Not Available
 ND = Not detected

Rationale Codes:

For selection as a COPC:
 ASL = Above Screening Level and site background.

For elimination as a COPC:
 BKG = Less than Background Concentration
 BSL = Below COPC Screening Level
 NUT = Essential nutrient

NTX = No toxicity criteria

Associated Samples

03SD0101	03SD0601	03SD1501
03SD0201	03SD0601D	
03SD0301	03SD0701	
03SD0401	03SD0801	
03SD0501	03SD0901	

RAGS Part D Table 3

Medium-Specific Exposure Point Concentration Summary

LIST OF TABLES
RAGS PART D TABLE 3
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY

Table No.

Reasonable Maximum/Central Tendency Exposures

- 3.1.RME Surface Soil
- 3.2.RME Subsurface Soil
- 3.3.RME Groundwater
- 3.4.RME Surface Water
- 3.5.RME Sediment

TABLE 3.1.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Site 3	Benzo(a)pyrene Equivalents	mg/kg	0.345	0.392 (N)	0.265	0.265	mg/kg	Maximum Detected Concentration	(1)
	Arsenic	mg/kg	2.45	3.66 (G)	6	3.66	mg/kg	Approximate Gamma 95% UCL	W-, A-D, & K-S Test (2)
	Iron	mg/kg	5578	7331 (N)	12900 J	7331	mg/kg	Student-t	W-Test (3)
	Vanadium	mg/kg	9.67	12.0 (N)	18.8	12.0	mg/kg	Student-t	W-Test (3)

For non-detects, the sample quantitation limit was used as a proxy concentration.

G = Gamma

N = Normal

- 1 - The recommended UCL exceeded the maximum detected concentration, therefore, the maximum detected concentration is used as the UCL.
- 2 - The Anderson-Darling and Kolmogorov-Smirnov tests indicate that the data follows a gamma distribution. The ProUCL guidance recommends that the Approximate Gamma 95% UCL be used as the exposure point concentration.
- 3 - The Shapiro-Wilks test indicates that the data is normally distributed. The ProUCL guidance recommends that the Student-t UCL be used as the exposure point concentration.

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

TABLE 3.2.RME
 EXPOSURE POINT CONCENTRATION SUMMARY
 REASONABLE MAXIMUM EXPOSURE
 NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Subsurface Soil
Exposure Medium: Subsurface Soil

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Site 3	Arsenic	mg/kg	0.852	1.17 (NP)	2.4	1.17	mg/kg	Student-t UCL	W-, A-D, & K-S Test (1)
	Iron	mg/kg	1337	2905 (G)	6640	2905	mg/kg	Approximate Gamma 95% UCL	W-, A-D, & K-S Test (2)
	Vanadium	mg/kg	4.29	7.48 (G)	13.8	7.48	mg/kg	Approximate Gamma 95% UCL	W-, A-D, & K-S Test (2)

For non-detects, the sample quantitation limit was used as a proxy concentration.

G = Gamma

NP = Non-parametric

- 1 - The Shapiro-Wilks, Anderson-Darling, and Kolmogorov-Smirnov tests indicate that the data is non-parametric. The ProUCL guidance recommends that the Student-t or Modified-t UCL be used as the exposure point concentration. The Student-t UCL is presented.
- 2 - The Anderson-Darling and Kolmogorov-Smirnov tests indicate that the data follows a gamma distribution. The ProUCL guidance recommends that the Approximate Gamma 95% UCL be used as the exposure point concentration.

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

TABLE 3.3.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Site 3	1,2,4-Trichlorobenzene	ug/L	2.23	4.03 (NP)	1.2	2.23	ug/L	Arithmetic Mean	(1)
	1,2-Dichloroethane	ug/L	2.06	5.98 (NP)	1.6	2.06	ug/L	Arithmetic Mean	(1)
	Benzene	ug/L	2.22	6.39 (NP)	12	2.22	ug/L	Arithmetic Mean	(1)
	cis-1,2-Dichloroethene	ug/L	132	215 (G)	880	132	ug/L	Arithmetic Mean	(1)
	Methylene Chloride	ug/L	2.58	7.93 (NP)	14 J	2.58	ug/L	Arithmetic Mean	(1)
	trans-1,2-Dichloroethene	ug/L	11.6	45.6 (NP)	87.4	11.6	ug/L	Arithmetic Mean	(1)
	Trichloroethene	ug/L	12.8	83.5 (NP)	300	12.8	ug/L	Arithmetic Mean	(1)
	Vinyl Chloride	ug/L	17.1	60.9 (NP)	150	17.1	ug/L	Arithmetic Mean	(1)
	Aluminum	ug/L	799	2718 (G)	4160 J	799	ug/L	Arithmetic Mean	(1)
	Arsenic	ug/L	11.5	57.8 (NP)	38.4	11.5	ug/L	Arithmetic Mean	(1)
	Chromium	ug/L	3.24	6.80 (NP)	7.5	3.24	ug/L	Arithmetic Mean	(1)
	Iron	ug/L	15878	29825 (G)	33500	15878	ug/L	Arithmetic Mean	(1)
	Lead	ug/L	1.51	1.54 (NP)	1.6	1.51	ug/L	Arithmetic Mean	(1)
	Manganese	ug/L	137	163 (N)	211	137	ug/L	Arithmetic Mean	(1)
Vanadium	ug/L	5.33	5.94 (NP)	7.6	5.33	ug/L	Arithmetic Mean	(1)	

For non-detects, the sample quantitation limit was used as a proxy concentration.

G - Gamma distribution.

N - Normal distribution.

NP - Nonparametric distribution.

J - Estimated value.

1 - The mean concentration in the groundwater plume is used as the exposure point concentration for groundwater.

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

TABLE 3.4.RME
 EXPOSURE POINT CONCENTRATION SUMMARY
 REASONABLE MAXIMUM EXPOSURE
 NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Site 3	Bis(2-ethylhexyl)phthalate	ug/L	11.1	13.3 (NP)	19	19	ug/L	Maximum Detected Concentration	(1)
	Iron	ug/L	2381	7312 (NP)	3680	3680	ug/L	Maximum Detected Concentration	(1)
	Manganese	ug/L	47.8	68.3 (N)	98.2	98.2	ug/L	Maximum Detected Concentration	(1)

For non-detects, the sample quantitation limit was used as a proxy concentration.

N = Normal

NP = Non-parametric

1 - There were less than 10 samples therefore the maximum detected concentration was used as the exposure point concentration.

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

TABLE 3.5.RME
EXPOSURE POINT CONCENTRATION SUMMARY
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Point	Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL (Distribution)	Maximum Concentration (Qualifier)	Exposure Point Concentration			
						Value	Units	Statistic	Rationale
Site 3	Aluminum	mg/kg	7534	10752 (N)	15600	10752	mg/kg	Student-t	W-Test (1)
	Arsenic	mg/kg	5.06	7.83 (N)	13.2	7.83	mg/kg	Student-t	W-Test (1)
	Iron	mg/kg	5073	7435 (N)	12000	7435	mg/kg	Student-t	W-Test (1)
	Vanadium	mg/kg	12.2	17.1 (N)	25.4	17.1	mg/kg	Student-t	W-Test (1)

For non-detects, the sample quantitation limit was used as a proxy concentration.

N - Normal distribution.

1 - The Shapiro-Wilks *W* test indicates that the data are normally distributed. The ProUCL guidance recommends that the 95% Student-t UCL be used as the exposure point concentration.

Exposure point concentrations for the RME scenarios are also the exposure point concentrations for the CTE scenarios.

RAGS Part D Table 4

Values Used For Daily Intake Calculations

LIST OF TABLES
RAGS PART D TABLE 4
VALUES USED FOR DAILY INTAKE CALCULATIONS

Table No.

Reasonable Maximum Exposures

4.1.RME	Construction Workers Exposed to Surface/Subsurface Soil
4.2.RME	Construction Workers Exposed to Groundwater
4.3.RME	Construction Workers Exposed to Volatile Emissions from Groundwater
4.4.RME	Construction Workers Exposed to Sediment
4.5.RME	Construction Workers Exposed to Surface Water
4.6.RME	Maintenance Workers Exposed to Surface/Subsurface Soil
4.7.RME	Maintenance Workers Exposed to Surface Water
4.8.RME	Maintenance Workers Exposed to Sediment
4.9.RME	Industrial Workers Exposed to Surface/Subsurface Soil
4.10.RME	Industrial Workers Exposed to Surface Water
4.11.RME	Industrial Workers Exposed to Sediment
4.12.RME	Adolescent Trespassers Exposed to Surface/Subsurface Soil
4.13.RME	Adolescent Trespassers Exposed to Surface Water
4.14.RME	Adolescent Trespassers Exposed to Sediment
4.15.RME	Adult Trespassers Exposed to Surface/Subsurface Soil
4.16.RME	Adult Trespassers Exposed to Surface Water
4.17.RME	Adult Trespassers Exposed to Sediment
4.18.RME	Child Residents Exposed to Surface/Subsurface Soil
4.19.RME	Child Residents Exposed to Groundwater
4.20.RME	Child Residents Users Exposed to Surface Water
4.21.RME	Child Residents Users Exposed to Sediment
4.22.RME	Adult Residents Exposed to Surface/Subsurface Soil
4.23.RME	Adult Residents Exposed to Groundwater
4.24.RME	Adult Residents Users Exposed to Surface Water
4.25.RME	Adult Residents Users Exposed to Sediment

Central Tendency Exposures

4.1.CTE	Construction Workers Exposed to Surface/Subsurface Soil
4.2.CTE	Construction Workers Exposed to Groundwater
4.3.CTE	Construction Workers Exposed to Volatile Emissions from Groundwater
4.4.CTE	Construction Workers Exposed to Sediment
4.5.CTE	Construction Workers Exposed to Surface Water
4.6.CTE	Maintenance Workers Exposed to Surface/Subsurface Soil
4.7.CTE	Maintenance Workers Exposed to Surface Water
4.8.CTE	Maintenance Workers Exposed to Sediment
4.9.CTE	Industrial Workers Exposed to Surface/Subsurface Soil
4.10.CTE	Industrial Workers Exposed to Surface Water
4.11.CTE	Industrial Workers Exposed to Sediment
4.12.CTE	Adolescent Trespassers Exposed to Surface/Subsurface Soil
4.13.CTE	Adolescent Trespassers Exposed to Surface Water
4.14.CTE	Adolescent Trespassers Exposed to Sediment
4.15.CTE	Adult Trespassers Exposed to Surface/Subsurface Soil
4.16.CTE	Adult Trespassers Exposed to Surface Water
4.17.CTE	Adult Trespassers Exposed to Sediment
4.18.CTE	Child Residents Exposed to Surface/Subsurface Soil
4.19.CTE	Child Residents Exposed to Groundwater
4.20.CTE	Child Residents Users Exposed to Surface Water
4.21.CTE	Child Residents Users Exposed to Sediment
4.22.CTE	Adult Residents Exposed to Surface/Subsurface Soil
4.23.CTE	Adult Residents Exposed to Groundwater
4.24.CTE	Adult Residents Users Exposed to Surface Water
4.25.CTE	Adult Residents Users Exposed to Sediment

4.26 Dermal Worksheet

TABLE 4.1.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction Workers	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) = <u>CS x IRS x CF3 x FI x EF x ED</u> BW x AT
				IR-S	Ingestion Rate	330	mg/day	USEPA, 2002b	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 2002b	
				EF	Exposure Frequency	250	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989					
Dermal	Construction Workers	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Dermally Absorbed Dose (mg/kg/day) = <u>CS x CF3 x SA x SSAF x DABS x EF x ED</u> BW x AT
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	250	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	

Notes:

1 - Professional judgment.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 2002a: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (\text{IR-S} \times \text{CF3} \times \text{FI} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{CF3} \times \text{SA} \times \text{SSAF} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Cancer Ingestion Intake} = 4.61\text{E-}08$$

$$\text{Cancer Dermal Intake} = 1.38\text{E-}07$$

$$\text{Noncancer Ingestion Intake} = 3.23\text{E-}06$$

$$\text{Noncancer Dermal Intake} = 9.69\text{E-}06$$

TABLE 4.2.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Dermal	Construction Workers	Adult	Site 3	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = $\frac{DA_{event} \times EV \times EF \times ED \times SA}{BW \times AT}$
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	4	hours/day	(1)	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989					

Sources:

1 - Professional judgment.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Dermal Intake = 5.54E-02

Noncancer Dermal Intake = 3.87E+00

TABLE 4.3.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Construction Workers	Adult	Site 3	CA	Chemical concentration in air	Calculated	mg/m3	VDEQ, 2004	Intake (mg/kg/day) = <u>CA x IR x ET x EF x ED</u> BW x AT CA = CW x CF x VF
				CW	Chemical concentration in water.	Average	ug/L	--	
				CF	Conversion Factor	0.001	mg/ug	--	
				IR	Inhalation Rate	2.5	m3/hour	USEPA, 1993	
				ET	Exposure Time	4	hours/day	(1)	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
				VF	Volatilization Factor	Calculated	(mg/m3)/(mg/L)	VDEQ, 2004	

Notes:

1 - Professional judgment.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

VDEQ, 2004: Virginia Department of Environmental Quality (VDEQ, online- <http://www.deq.state.va.us/vrprisk/homepage.html>).

Unit Intake Calculations

Inhalation Intake = (IR x ET x EF x ED)/(BW x AT)

Cancer Inhalation Intake = 1.68E-07

Noncancer Inhalation Intake = 1.17E-05

TABLE 4.4.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Construction Workers	Adult	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) = <u>CW x CF x IR-GW x EF x ED</u> BW x AT
				CR	Contact Rate	0.01	L/hour	USEPA IV, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	30	events/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989					
Dermal	Construction Workers	Adult	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = <u>DAevent x EV x EF x ED x SA</u> BW x AT See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989					

Notes:
1 - It is assumed that a construction worker is exposed to surface water 30 days a year for 1 hours a day for RME and 15 days a year 1 hours a day for CTE. Assumes a one year construction scenario.

Sources:
USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.
USEPA Region IV, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.
USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (CR x CF x ET x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 1.68E-10

Cancer Dermal Intake = 5.54E-02

Noncancer Ingestion Intake = 1.17E-08

Noncancer Dermal Intake = 3.87E+00

TABLE 4.5.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Construction Workers	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	ug/L	USEPA, 2002a	Intake (mg/kg/day) = <u>CS x IRS x CF3 x FI x EF x ED</u> BW x AT
				IR-S	Ingestion Rate	330	mg/day	USEPA 2002b	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA 2002	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989					
Dermal	Construction Workers	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002a	Dermally Absorbed Dose (mg/kg/day) = <u>CS x CF3 x SA x SSAF x DABS x EF x ED</u> BW x AT
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA 2002b	
				SSAF	Soil to Skin Adherence Factor	0.3	mg/cm2/event	USEPA 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA 2004	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989					
AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989					

Notes:

1 - It is assumed that a construction worker is exposed to sediment 30 days a year for RME and 15 days a year for CTE. Assumes a one year construction scenario.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002a: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (\text{IR-S} \times \text{CF3} \times \text{FI} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{CF3} \times \text{SA} \times \text{SSAF} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Cancer Ingestion Intake} = 5.54\text{E-}09$$

$$\text{Cancer Dermal Intake} = 1.66\text{E-}08$$

$$\text{Noncancer Ingestion Intake} = 3.87\text{E-}07$$

$$\text{Noncancer Dermal Intake} = 1.16\text{E-}06$$

TABLE 4.6.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Maintenance Workers	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = <u>$CS \times IRS \times CF3 \times FI \times EF \times ED$</u> BW x AT
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1991	
				EF	Exposure Frequency	24	days/year	(1)	
				ED	Exposure Duration	25	years	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	
Dermal	Maintenance Workers	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = <u>$CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED$</u> BW x AT
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm ²	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm ² /event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	24	days/year	(1)	
				ED	Exposure Duration	25	years	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	

Notes:

1 - Professional Judgement. Assume 2 days a month for RME and 1 day a month for CTE.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (IR-S \times CF3 \times FI \times EF \times ED)/(BW \times AT)$$

$$\text{Dermal Intake} = (CF3 \times SA \times SSAF \times EF \times ED)/(BW \times AT)$$

$$\text{Cancer Ingestion Intake} = 3.35E-08$$

$$\text{Cancer Dermal Intake} = 2.21E-07$$

$$\text{Noncancer Ingestion Intake} = 9.39E-08$$

$$\text{Noncancer Dermal Intake} = 6.20E-07$$

TABLE 4.7.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Maintenance Workers	Adult	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA , 2002	Chronic Daily Intake (CDI) (mg/kg/day) = $\frac{CW \times CF \times IR-GW \times EF \times ED}{BW \times AT}$
				CR	Contact Rate	0.01	L/hour	USEPA IV, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	24	events/year	(1)	
				ED	Exposure Duration	25	years	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989					
Dermal	Maintenance Workers	Adult	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = $\frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$ See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	24	days/year	(1)	
				ED	Exposure Duration	25	years	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989					

Notes:

1 - Professional Judgement. Assume 2 days a month for RME and 1 day a month for CTE.

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
- USEPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.
- USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
- USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
- USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Ingestion Intake} = (CR \times CF \times ET \times EF \times ED) / (BW \times AT)$$

$$\text{Dermal Intake} = (SA \times EV \times EF \times ED) / (BW \times AT)$$

Cancer Ingestion Intake = 3.35E-09

Cancer Dermal Intake = 1.11E+00

Noncancer Ingestion Intake = 9.39E-09

Noncancer Dermal Intake = 3.10E+00

TABLE 4.8.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Maintenance Workers	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = $\frac{CS \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1991	
				EF	Exposure Frequency	24	days/year	(1)	
				ED	Exposure Duration	25	years	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989					
Dermal	Maintenance Workers	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = $\frac{CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm ²	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm ² /event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	24	days/year	(1)	
				ED	Exposure Duration	25	years	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	

Notes:

1 - Professional Judgement. Assume 2 days a month for RME and 1 day a month for CTE.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (IR-S \times CF3 \times FI \times EF \times ED) / (BW \times AT)$$

$$\text{Dermal Intake} = (CF3 \times SA \times SSAF \times EF \times ED) / (BW \times AT)$$

$$\text{Cancer Ingestion Intake} = 3.35E-08$$

$$\text{Cancer Dermal Intake} = 2.21E-07$$

$$\text{Noncancer Ingestion Intake} = 9.39E-08$$

$$\text{Noncancer Dermal Intake} = 6.20E-07$$

TABLE 4.9.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Industrial Worker	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) = <u>CS x IRS x CF3 x FI x EF x ED</u> BW x AT
				IR-S	Ingestion Rate	100	mg/day	USEPA, 2002b	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 2002b	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				ED	Exposure Duration	25	years	USEPA, 2002b	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	
Dermal	Industrial Worker	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = <u>CS x CF3 x SA x SSAF x DABS x EF x ED</u> BW x AT
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm ²	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm ² /event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				ED	Exposure Duration	25	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989					

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
- USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.
- USEPA, 2002a: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
- USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.
- USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 3.49E-07

Cancer Dermal Intake = 2.31E-06

Noncancer Ingestion Intake = 9.78E-07

Noncancer Dermal Intake = 6.46E-06

TABLE 4.10.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Industrial Worker	Adult	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA , 2002	Chronic Daily Intake (CDI) (mg/kg/day) = <u>CW x CF x IR-GW x EF x ED</u> BW x AT
				CR	Contact Rate	0.01	L/hour	USEPA IV, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	24	events/year	(1)	
				ED	Exposure Duration	25	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989					
Dermal	Industrial Worker	Adult	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = <u>DAevent x EV x EF x ED x SA</u> BW x AT See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	24	days/year	(1)	
				ED	Exposure Duration	25	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989					

Notes:

1 - Professional Judgement. Assume 2 days a month for RME and 1 day a month for CTE.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. USEPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA Region IV, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Ingestion Intake} = (\text{CR} \times \text{CF} \times \text{ET} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{SA} \times \text{EV} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

Cancer Ingestion Intake = 3.35E-09

Cancer Dermal Intake = 1.11E+00

Noncancer Ingestion Intake = 9.39E-09

Noncancer Dermal Intake = 3.10E+00

TABLE 4.11.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Industrial Worker	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = $\frac{CS \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1993	
				EF	Exposure Frequency	24	days/year	(1)	
				ED	Exposure Duration	25	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	
Dermal	Industrial Worker	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = $\frac{CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm ²	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm ² /event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	24	days/year	(1)	
				ED	Exposure Duration	25	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	9125	days	USEPA, 1989	

Notes:

1 - Professional Judgement. Assume 2 days a month for RME and 1 day a month for CTE.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. USEPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 1.68E-08

Cancer Dermal Intake = 2.21E-07

Noncancer Ingestion Intake = 4.70E-08

Noncancer Dermal Intake = 6.20E-07

TABLE 4.12.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespasser	Adolescent	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = $CS \times IR-S \times CF3 \times FI \times EF \times ED$ BW x AT
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1991	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	11	years	(2)	
				BW	Body Weight	45	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4015	days	USEPA, 1989	
Dermal	Trespasser	Adolescent	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = $CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED$ BW x AT
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3250	cm2	(3)	
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	11	years	(2)	
				BW	Body Weight	45	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4015	days	USEPA, 1989	

Notes:

- 1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.
- 2 - Adolescents from age 6 to 17.
- 3 - Assumes that 25 percent of the total body surface area is exposed (USEPA, 2004).

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.
- USEPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.
- USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
- USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = $(IR-S \times CF3 \times FI \times EF \times ED)/(BW \times AT)$

Dermal Intake = $(CF3 \times SA \times SSAF \times EF \times ED)/(BW \times AT)$

Cancer Ingestion Intake = 2.87E-08 Cancer Dermal Intake = 1.87E-07
Noncancer Ingestion Intake = 1.83E-07 Noncancer Dermal Intake = 1.19E-06

TABLE 4.13.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Trespasser	Adolescent	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) = $CW \times CF \times IR-GW \times EF \times ED$ BW x AT
				CR	Contact Rate	0.05	ml/hr	USEPA 4, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	30	events/year	(2)	
				ED	Exposure Duration	11	years	(3)	
				BW	Body Weight	45	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	4,015	days	USEPA, 1989					
Dermal	Trespasser	Adolescent	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = $DAevent \times EV \times EF \times ED \times SA$ BW x AT See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	3,250	cm2	(4)	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	30	days/year	(2)	
				ED	Exposure Duration	11	years	(3)	
				BW	Body Weight	45	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	4,015	days	USEPA, 1989					

Notes:

- 1 - Professional judgment.
- 2 - Assume 2 to 3 days a week in warm weather months for RME. CTE is one half the RME.
- 3 - Adolescents from age 6 to 17.
- 4 - Assumes that 25 percent of the total body surface area is exposed (USEPA, 1997).

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.
- USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
- USEPA Region 4, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.
- USEPA, 1997: Exposure Factors Handbook. EPA/600/8-95/002FA.
- USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
- USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (CR x CF x ET x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 1.44E-08
Noncancer Ingestion Intake = 9.13E-08

Cancer Dermal Intake = 9.33E-01
Noncancer Dermal Intake = 5.94E+00

TABLE 4.14.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespasser	Adolescent	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = $\frac{CS \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1991	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	11	years	(2)	
				BW	Body Weight	45	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4,015	days	USEPA, 1989	
Dermal	Trespasser	Adolescent	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = $\frac{CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	3,250	cm2	(3)	
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	11	years	(2)	
				BW	Body Weight	45	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4,015	days	USEPA, 1989	

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

2 - Adolescents from age 6 to 17.

3 - Assumes that 25 percent of the total body surface area is exposed (EPA, 1997).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (IR-S \times CF3 \times FI \times EF \times ED)/(BW \times AT)$$

$$\text{Dermal Intake} = (CF3 \times SA \times SSAF \times EF \times ED)/(BW \times AT)$$

$$\text{Cancer Ingestion Intake} = 2.87E-08$$

$$\text{Cancer Dermal Intake} = 1.87E-07$$

$$\text{Noncancer Ingestion Intake} = 1.83E-07$$

$$\text{Noncancer Dermal Intake} = 1.19E-06$$

TABLE 4.15.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespasser	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = <u>CS x IRS x CF3 x FI x EF x ED</u> BW x AT
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	(1)	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	19	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	6,935	days	USEPA, 1989	
Dermal	Trespasser	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = <u>CS x CF3 x SA x SSAF x DABS x EF x ED</u> BW x AT
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	19	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	6,935	days	USEPA, 1989	

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

2 - Assumed head, arms, hands, lower legs, and feet are exposed. USEPA, 1997.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (\text{IR-S} \times \text{CF3} \times \text{FI} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{CF3} \times \text{SA} \times \text{SSAF} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Cancer Ingestion Intake} = 3.19\text{E-}08$$

$$\text{Cancer Dermal Intake} = 1.27\text{E-}07$$

$$\text{Noncancer Ingestion Intake} = 1.17\text{E-}07$$

$$\text{Noncancer Dermal Intake} = 4.68\text{E-}07$$

TABLE 4.16.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Trespasser	Adult	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) = <u>CW x CF x IR-GW x EF x ED</u> BW x AT
				CR	Contact Rate	0.01	L/hour	USEPA 4, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	30	events/year	(1)	
				ED	Exposure Duration	19	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	6,935	days	USEPA, 1989					
Dermal	Trespasser	Adult	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = <u>DAevent x EV x EF x ED x SA</u> BW x AT
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	19	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	6,935	days	USEPA, 1989					

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA Region 4, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Ingestion Intake} = (\text{CR} \times \text{CF} \times \text{ET} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{SA} \times \text{EV} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

Cancer Ingestion Intake = 3.19E-09

Cancer Dermal Intake = 1.82E+00

Noncancer Ingestion Intake = 1.17E-08

Noncancer Dermal Intake = 6.69E+00

TABLE 4.17.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Trespasser	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = $\frac{CS \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	(1)	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	19	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	6,935	days	USEPA, 1989	
Dermal	Trespasser	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermal Absorbed Dose (mg/kg/day) = $\frac{CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm ²	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.1	mg/cm ² /event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	19	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	6,935	days	USEPA, 1989	

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (IR-S \times CF3 \times FI \times EF \times ED)/(BW \times AT)$$

$$\text{Dermal Intake} = (CF3 \times SA \times SSAF \times EF \times ED)/(BW \times AT)$$

$$\text{Cancer Ingestion Intake} = 3.19E-08$$

$$\text{Cancer Dermal Intake} = 1.27E-07$$

$$\text{Noncancer Ingestion Intake} = 1.17E-07$$

$$\text{Noncancer Dermal Intake} = 4.68E-07$$

TABLE 4.18.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Resident	Child	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = $\frac{CS \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
				IR-S	Ingestion Rate	200	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ED1	Exposure Duration (Age 0 - 2)	2	years	USEPA, 1991	
				ED2	Exposure Duration (Age 2 - 6)	4	years	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	
Dermal	Resident	Child	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermal Absorbed Dose (mg/kg/day) = $\frac{CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
				CF3	Conversion Factor 3	1E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	2,800	cm2	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ED1	Exposure Duration (Age 0 - 2)	2	years	USEPA, 1991	
				ED2	Exposure Duration (Age 2 - 6)	4	years	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989					

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.
- USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.
- USEPA, 1994: USEPA Region I Risk Updates, August 1994.
- USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
- USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 3.65E-07

Cancer Dermal Intake = 1.02E-06

Noncancer Ingestion Intake = 4.26E-06

Noncancer Dermal Intake = 1.19E-05

TABLE 4.19.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Residents	Child	Site 3	CGW	Chemical Concentration in Groundwater	Average	mg/kg	USEPA 4, 2000	Chronic Daily Intake (CDI) (mg/kg/day) = <u>CGW x CF x IR-GW x EF x ED</u> BW x AT
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	1.5	L/day	USEPA, 1997	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ED	Exposure Duration	6	years	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989					
Dermal	Residents	Child	Site 3	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = <u>DAevent x EV x EF x ED x SA</u> BW x AT See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	6,600	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				ET	Exposure Time	0.33	hours/day	USEPA, 1997	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ED	Exposure Duration	6	years	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989	

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.
- USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.
- USEPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa
- USEPA Region 4, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.
- USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 8.22E-06
Noncancer Ingestion Intake = 9.59E-05

Cancer Dermal Intake = 3.62E+01
Noncancer Dermal Intake = 4.22E+02

TABLE 4.20.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Resident	Child	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) = $\frac{CW \times CF \times IR-GW \times EF \times ED}{BW \times AT}$
				CR	Contact Rate	0.05	L/hour	USEPA 4, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	30	events/year	(1)	
				ED	Exposure Duration	6	years	USEPA, 1989	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989					
Dermal	Resident	Child	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermal Absorbed Dose (mg/kg/day) = $\frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
				SA	Skin Surface Available for Contact	2,800	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	6	years	USEPA, 1989	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989					

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA Region 4, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Ingestion Intake} = (CR \times CF \times ET \times EF \times ED) / (BW \times AT)$$

$$\text{Dermal Intake} = (SA \times EV \times EF \times ED) / (BW \times AT)$$

Cancer Ingestion Intake = 2.35E-08

Cancer Dermal Intake = 1.32E+00

Noncancer Ingestion Intake = 2.74E-07

Noncancer Dermal Intake = 1.53E+01

TABLE 4.21.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Resident	Child	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = $\frac{CS \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
				IR-S	Ingestion Rate	200	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1991	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	6	years	USEPA, 1989	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989					
Dermal	Resident	Child	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermal Absorbed Dose (mg/kg/day) = $\frac{CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
				CF3	Conversion Factor 3	1E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	2,800	cm ²	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.2	mg/cm ² /event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	6	years	USEPA, 1989	
				BW	Body Weight	15	kg	USEPA, 1989	
AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989					
AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1989					

Sources:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (IR-S \times CF3 \times FI \times EF \times ED) / (BW \times AT)$$

$$\text{Dermal Intake} = (CF3 \times SA \times SSAF \times EF \times ED) / (BW \times AT)$$

$$\text{Cancer Ingestion Intake} = 9.39E-08$$

$$\text{Cancer Dermal Intake} = 2.63E-07$$

$$\text{Noncancer Ingestion Intake} = 1.10E-06$$

$$\text{Noncancer Dermal Intake} = 3.07E-06$$

TABLE 4.22.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Resident	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = $CS \times IR \times CF3 \times FI \times EF \times ED$ BW x AT
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ED1	Exposure Duration (Age 6 - 16)	10	years	USEPA, 1989	
				ED2	Exposure Duration (Age 16 - 30)	14	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	
Dermal	Resident	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = $CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED$ BW x AT
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm ²	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm ² /event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ED1	Exposure Duration (Age 6 - 16)	10	years	USEPA, 1989	
				ED2	Exposure Duration (Age 16 - 30)	14	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
- USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.
- USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
- USEPA, 1994: USEPA Region I Risk Updates, August 1994.
- USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.
- USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 1.96E-07

Cancer Dermal Intake = 7.81E-07

Noncancer Ingestion Intake = 5.71E-07

Noncancer Dermal Intake = 2.28E-06

TABLE 4.23.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Residents	Adult	Site 3	CGW	Chemical Concentration in Groundwater	Average	ug/L	USEPA 4, 2000	Chronic Daily Intake (CDI) (mg/kg/day) = <u>CGW x CF x IR-GW x EF x ED</u> BW x AT
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	2	L/day	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ED	Exposure Duration	24	years	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989					
Dermal	Residents	Adult	Site 3	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = <u>DAevent x EV x EF x ED x SA</u> BW x AT See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	18,000	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				ET	Exposure Time	0.33	hours/day	USEPA, 2004	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ED	Exposure Duration	24	years	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA Region 4, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 9.39E-06

Cancer Dermal Intake = 8.45E+01

Noncancer Ingestion Intake = 2.74E-05

Noncancer Dermal Intake = 2.47E+02

TABLE 4.24.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Resident	Adult	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) = $\frac{CW \times CF \times IR-GW \times EF \times ED}{BW \times AT}$
				CR	Contact Rate	0.01	L/hour	USEPA 4, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	30	events/year	(1)	
				ED	Exposure Duration	24	years	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989					
Dermal	Resident	Adult	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermal Absorbed Dose (mg/kg/day) = $\frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	24	years	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989					

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (CR x CF x ET x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 4.03E-09

Cancer Dermal Intake = 2.29E+00

Noncancer Ingestion Intake = 1.17E-08

Noncancer Dermal Intake = 6.69E+00

TABLE 4.25.RME
VALUES USED FOR DAILY INTAKE CALCULATIONS
REASONABLE MAXIMUM EXPOSURE
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Resident	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = <u>CSs x IRS x CF3 x FI x EF x ED</u> BW x AT
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1991	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1991	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	24	years	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	
Dermal	Resident	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = <u>CS x CF3 x SA x SSAF x DABS x EF x ED</u> BW x AT
				CF3	Conversion Factor 3	1E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.07	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	30	days/year	(1)	
				ED	Exposure Duration	24	years	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1989	

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (\text{IR-S} \times \text{CF3} \times \text{FI} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{CF3} \times \text{SA} \times \text{SSAF} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Cancer Ingestion Intake} = 4.03\text{E-}08$$

$$\text{Cancer Dermal Intake} = 1.61\text{E-}07$$

$$\text{Noncancer Ingestion Intake} = 1.17\text{E-}07$$

$$\text{Noncancer Dermal Intake} = 4.68\text{E-}07$$

TABLE 4.1.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Construction Workers	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Intake (mg/kg/day) = <u>CS x IRS x CF3 x FI x EF x ED</u> BW x AT
				IR-S	Ingestion Rate	165	mg/day	(1)	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 2002b	
				EF	Exposure Frequency	125	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
Dermal	Construction Workers	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002a	Dermally Absorbed Dose (mg/kg/day) = <u>CS x CF3 x SA x SSAF x DABS x EF x ED</u> BW x AT
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2002b	
				SSAF	Soil to Skin Adherence Factor	0.1	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	125	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	

Notes:

1 - Professional judgment. For some factors, CTE is assumed to be 50 percent of RME.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 2002a: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (\text{IR-S} \times \text{CF3} \times \text{FI} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{CF3} \times \text{SA} \times \text{SSAF} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Cancer Ingestion Intake} = 1.15\text{E-}08$$

$$\text{Cancer Dermal Intake} = 2.31\text{E-}08$$

$$\text{Noncancer Ingestion Intake} = 8.07\text{E-}07$$

$$\text{Noncancer Dermal Intake} = 1.61\text{E-}06$$

TABLE 4.2.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Dermal	Construction Workers	Adult	Site 3	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = $\frac{DA_{event} \times EV \times EF \times ED \times SA}{BW \times AT}$
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	2	hours/day	(1)	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989					

Sources:

1 - Professional judgment. For some factors, CTE is assumed to be 50 percent of RME.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Dermal Intake = 2.77E-02

Noncancer Dermal Intake = 1.94E+00

TABLE 4.3.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Groundwater
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Inhalation	Construction Workers	Adult	Site 3	CA	Chemical concentration in air	Calculated	mg/m3	VDEQ, 2004	Intake (mg/kg/day) = $\frac{CA \times IR \times ET \times EF \times ED}{BW \times AT}$ $CA = CW \times CF \times VF$
				CW	Chemical concentration in water.	Average	ug/L	--	
				CF	Conversion Factor	0.001	mg/ug	--	
				IR	Inhalation Rate	2.5	m3/hour	USEPA, 1993	
				ET	Exposure Time	2	hours/day	(1)	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
				VF	Volatilization Factor	Calculated	(mg/m3)/(mg/L)	VDEQ, 2004	

Notes:

- 1 - Professional judgment. For some factors, CTE is assumed to be 50 percent of RME.
- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.
- USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
- VDEQ, 2004: Virginia Department of Environmental Quality (VDEQ, online- <http://www.deq.state.va.us/vrprisk/homepage.html>).

Unit Intake Calculations

Inhalation Intake = (IR x ET x EF x ED)/(BW x AT)

Cancer Inhalation Intake = 4.19E-08

Noncancer Inhalation Intake = 2.94E-06

TABLE 4.4.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Construction Workers	Adult	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) = <u>$CW \times CF \times IR-GW \times EF \times ED$</u> BW x AT
				CR	Contact Rate	0.01	L/hour	USEPA IV, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	15	events/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	
Dermal	Construction Workers	Adult	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = <u>$DAevent \times EV \times EF \times ED \times SA$</u> BW x AT See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989	

Notes:

1 - It is assumed that a construction worker is exposed to surface water 30 days a year for 1 hours a day for RME and 15 days a year 1 hours a day for CTE. Assumes a one year construction scenario.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA Region IV, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Ingestion Intake} = (CR \times CF \times ET \times EF \times ED) / (BW \times AT)$$

$$\text{Dermal Intake} = (SA \times EV \times EF \times ED) / (BW \times AT)$$

$$\text{Cancer Ingestion Intake} = 8.39E-11$$

$$\text{Cancer Dermal Intake} = 2.77E-02$$

$$\text{Noncancer Ingestion Intake} = 5.87E-09$$

$$\text{Noncancer Dermal Intake} = 1.94E+00$$

TABLE 4.5.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Construction Workers	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	ug/L	USEPA, 2002a	Intake (mg/kg/day) = $\frac{CS \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
				IR-S	Ingestion Rate	165	mg/day	(1)	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA 2002b	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989					
Dermal	Construction Workers	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002a	Dermal Absorbed Dose (mg/kg/day) = $\frac{CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA 2002b	
				SSAF	Soil to Skin Adherence Factor	0.1	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	1	years	(1)	
				BW	Body Weight	70	kg	USEPA, 1989	
AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989					
AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1989					

Notes:

1 - It is assumed that a construction worker is exposed to sediment 30 days a year for 4 hours a day for RME and 15 days a year 2 hours a day for CTE. Assumes a one year construction scenario.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 2002a: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2002b: Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (IR-S \times CF3 \times FI \times EF \times ED) / (BW \times AT)$$

$$\text{Dermal Intake} = (CF3 \times SA \times SSAF \times EF \times ED) / (BW \times AT)$$

$$\text{Cancer Ingestion Intake} = 1.38E-09$$

$$\text{Cancer Dermal Intake} = 2.77E-09$$

$$\text{Noncancer Ingestion Intake} = 9.69E-08$$

$$\text{Noncancer Dermal Intake} = 1.94E-07$$

TABLE 4.6.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Soil/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Maintenance Workers	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = <u>CS x IRS x CF3 x FI x EF x ED</u> BW x AT
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1993	
				EF	Exposure Frequency	12	days/year	(1)	
				ED	Exposure Duration	9	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989					
Dermal	Maintenance Workers	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = <u>CS x CF3 x SA x SSAF x DABS x EF x ED</u> BW x AT
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.02	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	12	days/year	(1)	
				ED	Exposure Duration	9	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	

Notes:

1 - Professional Judgement. Assume 2 days a month for RME and 1 day a month for CTE.

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
- USEPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.
- USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
- USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
- USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (\text{IR-S} \times \text{CF3} \times \text{FI} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{CF3} \times \text{SA} \times \text{SSAF} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Cancer Ingestion Intake} = 3.02\text{E-}09$$

$$\text{Cancer Dermal Intake} = 3.99\text{E-}09$$

$$\text{Noncancer Ingestion Intake} = 2.35\text{E-}08$$

$$\text{Noncancer Dermal Intake} = 3.10\text{E-}08$$

TABLE 4.7.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Maintenance Workers	Adult	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) = <u>CW x CF x IR-GW x EF x ED</u> BW x AT
				CR	Contact Rate	0.01	L/hour	USEPA IV, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	12	events/year	(1)	
				ED	Exposure Duration	9	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	
Dermal	Maintenance Workers	Adult	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = <u>DAevent x EV x EF x ED x SA</u> BW x AT See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	12	days/year	(1)	
				ED	Exposure Duration	9	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	

Notes:

1 - Professional Judgement. Assume 2 days a month for RME and 1 day a month for CTE.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Ingestion Intake} = (\text{CR} \times \text{CF} \times \text{ET} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{SA} \times \text{EV} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Cancer Ingestion Intake} = 6.04\text{E-}10$$

$$\text{Cancer Dermal Intake} = 1.99\text{E-}01$$

$$\text{Noncancer Ingestion Intake} = 4.70\text{E-}09$$

$$\text{Noncancer Dermal Intake} = 1.55\text{E+}00$$

TABLE 4.8.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Maintenance Workers	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = <u>CS x IRS x CF3 x FI x EF x ED</u> BW x AT
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1993	
				EF	Exposure Frequency	12	days/year	(1)	
				ED	Exposure Duration	9	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	
Dermal	Maintenance Workers	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = <u>CS x CF3 x SA x SSAF x DABS x EF x ED</u> BW x AT
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.02	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	12	days/year	(1)	
				ED	Exposure Duration	9	years	USEPA, 1989	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989					

Notes:

1 - Professional Judgement. Assume 2 days a month for RME and 1 day a month for CTE.

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
- USEPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.
- USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
- USEPA, 1997: Exposure Factors Handbook. EPA/600/8-95/002FA.
- USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
- USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (\text{IR-S} \times \text{CF3} \times \text{FI} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{CF3} \times \text{SA} \times \text{SSAF} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

Cancer Ingestion Intake = 3.02E-09

Cancer Dermal Intake = 3.99E-09

Noncancer Ingestion Intake = 2.35E-08

Noncancer Dermal Intake = 3.10E-08

TABLE 4.9.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Industrial Worker	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = <u>$CS \times IRS \times CF3 \times FI \times EF \times ED$</u> BW x AT
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1993	
				EF	Exposure Frequency	219	days/year	USEPA, 1993	
				ED	Exposure Duration	9	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	
Dermal	Industrial Worker	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = <u>$CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED$</u> BW x AT
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.02	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	219	days/year	USEPA, 1993	
				ED	Exposure Duration	9	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
- USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
- USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
- USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = $(IR-S \times CF3 \times FI \times EF \times ED)/(BW \times AT)$

Dermal Intake = $(CF3 \times SA \times SSAF \times EF \times ED)/(BW \times AT)$

Cancer Ingestion Intake = 5.51E-08

Cancer Dermal Intake = 7.27E-08

Noncancer Ingestion Intake = 4.29E-07

Noncancer Dermal Intake = 5.66E-07

TABLE 4.10.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Industrial Worker	Adult	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA , 2002	Chronic Daily Intake (CDI) (mg/kg/day) = <u>CW x CF x IR-GW x EF x ED</u> BW x AT
				CR	Contact Rate	0.01	L/hour	USEPA IV, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	12	events/year	(1)	
				ED	Exposure Duration	9	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	
Dermal	Industrial Worker	Adult	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = <u>DAevent x EV x EF x ED x SA</u> BW x AT See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	12	days/year	(1)	
				ED	Exposure Duration	9	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	

Notes:

1 - Professional Judgement. Assume 2 days a month for RME and 1 day a month for CTE.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.

USEPA, 1991: Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Directive 9285.6-03.

USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Ingestion Intake} = (\text{CR} \times \text{CF} \times \text{ET} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{SA} \times \text{EV} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Cancer Ingestion Intake} = 6.04\text{E-}10$$

$$\text{Cancer Dermal Intake} = 1.99\text{E-}01$$

$$\text{Noncancer Ingestion Intake} = 4.70\text{E-}09$$

$$\text{Noncancer Dermal Intake} = 1.55\text{E+}00$$

TABLE 4.11.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Industrial Worker	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA 2002	Intake (mg/kg/day) = <u>CS x IRS x CF3 x FI x EF x ED</u> BW x AT
				IR-S	Ingestion Rate	25	mg/day	(1)	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1993	
				EF	Exposure Frequency	12	days/year	(1)	
				ED	Exposure Duration	9	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989	
Dermal	Industrial Worker	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = <u>CS x CF3 x SA x SSAF x DABS x EF x ED</u> BW x AT
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3300	cm2	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.02	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	12	days/year	(1)	
				ED	Exposure Duration	9	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	3285	days	USEPA, 1989					

Notes:

1 - Professional Judgement. Assume 2 days a month for RME and 1 day a month for CTE.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. USEPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (\text{IR-S} \times \text{CF3} \times \text{FI} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{CF3} \times \text{SA} \times \text{SSAF} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Cancer Ingestion Intake} = 1.51\text{E-}09$$

$$\text{Cancer Dermal Intake} = 3.99\text{E-}09$$

$$\text{Noncancer Ingestion Intake} = 1.17\text{E-}08$$

$$\text{Noncancer Dermal Intake} = 3.10\text{E-}08$$

TABLE 4.12.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespasser	Adolescent	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = $CSs \times IRS \times CF3 \times FI \times EF \times ED$ BW x AT
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1993	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	11	years	(2)	
				BW	Body Weight	45	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4015	days	USEPA, 1989	
Dermal	Trespasser	Adolescent	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = $CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED$ BW x AT
				CF3	Conversion Factor 3	0.000001	kg/mg	--	
				SA	Skin Surface Available for Contact	3250	cm2	(3)	
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	11	years	(2)	
				BW	Body Weight	45	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	4015	days	USEPA, 1989					

Notes:

- 1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.
- 2 - Adolescents from age 6 to 17.
- 3 - Assumes that 25 percent of the total body surface area is exposed (USEPA, 1997).

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.
USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (IR-S \times CF3 \times FI \times EF \times ED)/(BW \times AT)$$

$$\text{Dermal Intake} = (CF3 \times SA \times SSAF \times EF \times ED)/(BW \times AT)$$

Cancer Ingestion Intake = 7.18E-09 Cancer Dermal Intake = 1.87E-08
Noncancer Ingestion Intake = 4.57E-08 Noncancer Dermal Intake = 1.19E-07

TABLE 4.13.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Trespasser	Adolescent	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) = $\frac{CW \times CF \times IR \times GW \times EF \times ED}{BW \times AT}$
				CR	Contact Rate	0.05	ml/hr	USEPA 4, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	15	events/year	(2)	
				ED	Exposure Duration	11	years	(3)	
				BW	Body Weight	45	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4,015	days	USEPA, 1989	
Dermal	Trespasser	Adolescent	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = $\frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$ See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	3,100	cm2	(4)	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	15	days/year	(2)	
				ED	Exposure Duration	11	years	(3)	
				BW	Body Weight	45	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4,015	days	USEPA, 1989	

Notes:

- 1 - Professional judgment.
- 2 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.
- 3 - Adolescents from age 6 to 17.
- 4 - Assumes that 25 percent of the total body surface area is exposed (USEPA, 1997).

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.
- USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
- EPA Region 4, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.
- USEPA, 1997: Exposure Factors Handbook. EPA/600/8-95/002FA.
- USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.
- USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (CR x CF x ET x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 7.18E-09 Cancer Dermal Intake = 4.45E-01
Noncancer Ingestion Intake = 4.57E-08 Noncancer Dermal Intake = 2.83E+00

TABLE 4.14.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Trespasser	Adolescent	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = $\frac{CS \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1993	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	11	years	(2)	
				BW	Body Weight	45	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4,015	days	USEPA, 1989	
Dermal	Trespasser	Adolescent	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermal Absorbed Dose (mg/kg/day) = $\frac{CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	3,250	cm2	(3)	
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	11	years	(2)	
				BW	Body Weight	45	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4,015	days	USEPA, 1989	

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

2 - Adolescents from age 6 to 17.

3 - Assumes that 25 percent of the total body surface area is exposed (EPA, 1997).

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund's Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (IR-S \times CF3 \times FI \times EF \times ED)/(BW \times AT)$$

$$\text{Dermal Intake} = (CF3 \times SA \times SSAF \times EF \times ED)/(BW \times AT)$$

$$\text{Cancer Ingestion Intake} = 7.18E-09$$

$$\text{Cancer Dermal Intake} = 1.87E-08$$

$$\text{Noncancer Ingestion Intake} = 4.57E-08$$

$$\text{Noncancer Dermal Intake} = 1.19E-07$$

TABLE 4.15.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespasser	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = <u>$CS \times IRS \times CF3 \times FI \times EF \times ED$</u> BW x AT
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	(1)	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	7	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	
Dermal	Trespasser	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = <u>$CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED$</u> BW x AT
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.01	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	26	days/year	(1)	
				ED	Exposure Duration	7	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989					

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (IR-S \times CF3 \times FI \times EF \times ED)/(BW \times AT)$$

$$\text{Dermal Intake} = (CF3 \times SA \times SSAF \times EF \times ED)/(BW \times AT)$$

$$\text{Cancer Ingestion Intake} = 5.09E-09$$

$$\text{Cancer Dermal Intake} = 5.80E-09$$

$$\text{Noncancer Ingestion Intake} = 5.09E-08$$

$$\text{Noncancer Dermal Intake} = 5.80E-08$$

TABLE 4.16.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespasser	Adult	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) = <u>CW x CF x IR-GW x EF x ED</u> BW x AT
				CR	Contact Rate	0.01	L/hour	USEPA 4, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	15	events/year	(1)	
				ED	Exposure Duration	19	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1993	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	6,935	days	USEPA, 1989					
Dermal	Trespasser	Adult	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = <u>DAevent x EV x EF x ED x SA</u> BW x AT
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	19	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1993	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	6,935	days	USEPA, 1989					

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA Region 4, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Ingestion Intake} = (\text{CR} \times \text{CF} \times \text{ET} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{SA} \times \text{EV} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Cancer Ingestion Intake} = 1.59\text{E-}09$$

$$\text{Cancer Dermal Intake} = 9.08\text{E-}01$$

$$\text{Noncancer Ingestion Intake} = 5.87\text{E-}09$$

$$\text{Noncancer Dermal Intake} = 3.35\text{E+}00$$

TABLE 4.17.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespasser	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = $\frac{CS \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	(1)	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	11	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4,015	days	USEPA, 1989	
Dermal	Trespasser	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = $\frac{CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	11	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	4,015	days	USEPA, 1989	

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (IR-S \times CF3 \times FI \times EF \times ED)/(BW \times AT)$$

$$\text{Dermal Intake} = (CF3 \times SA \times SSAF \times EF \times ED)/(BW \times AT)$$

$$\text{Cancer Ingestion Intake} = 4.61E-09$$

$$\text{Cancer Dermal Intake} = 2.10E-08$$

$$\text{Noncancer Ingestion Intake} = 2.94E-08$$

$$\text{Noncancer Dermal Intake} = 1.34E-07$$

TABLE 4.18.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Resident	Child	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = <u>CS x IRS x CF3 x FI x EF x ED</u> BW x AT
				IR-S	Ingestion Rate	100	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1993	
				EF	Exposure Frequency	234	days/year	USEPA, 1993	
				ED	Exposure Duration	2	years	USEPA, 1993	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	
Dermal	Resident	Child	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = <u>CS x CF3 x SA x SSAF x DABS x EF x ED</u> BW x AT
				CF3	Conversion Factor 3	1E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	2,800	cm2	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	234	days/year	USEPA, 1993	
				ED	Exposure Duration	2	years	USEPA, 1993	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989					

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 1994: USEPA Region I Risk Updates, August 1994.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (\text{IR-S} \times \text{CF3} \times \text{FI} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{CF3} \times \text{SA} \times \text{SSAF} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Cancer Ingestion Intake} = 1.22\text{E-}07$$

$$\text{Cancer Dermal Intake} = 1.37\text{E-}07$$

$$\text{Noncancer Ingestion Intake} = 4.27\text{E-}06$$

$$\text{Noncancer Dermal Intake} = 4.79\text{E-}06$$

TABLE 4.19.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Residents	Child	Site 3	CGW	Chemical Concentration in Groundwater	Average	mg/kg	USEPA 4, 2000	Chronic Daily Intake (CDI) (mg/kg/day) = <u>CGW x CF x IR-GW x EF x ED</u> BW x AT
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	0.66	L/day	USEPA, 1997	
				EF	Exposure Frequency	234	days/year	USEPA, 1993	
				ED	Exposure Duration	2	years	USEPA, 1993	
				BW	Body Weight	15	kg	USEPA, 1993	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989					
Dermal	Residents	Child	Site 3	DAevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = <u>DAevent x EV x EF x ED x SA</u> BW x AT See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	6,600	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				ET	Exposure Time	0.25	hours/day	USEPA, 2004	
				EF	Exposure Frequency	234	days/year	USEPA, 1993	
				ED	Exposure Duration	2	years	USEPA, 1993	
				BW	Body Weight	15	kg	USEPA, 1993	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa

USEPA Region 4, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 8.06E-07

Cancer Dermal Intake = 8.06E+00

Noncancer Ingestion Intake = 2.82E-05

Noncancer Dermal Intake = 2.82E+02

TABLE 4.20.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Resident	Child	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) = <u>CW x CF x IR-GW x EF x ED</u> BW x AT
				CR	Contact Rate	0.05	L/hour	USEPA 4, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	15	events/year	(1)	
				ED	Exposure Duration	2	years	USEPA, 1993	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989					
Dermal	Resident	Child	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = <u>DAevent x EV x EF x ED x SA</u> BW x AT See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	2,800	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	(1)	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	2	years	USEPA, 1993	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989					

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA Region 4, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Ingestion Intake} = (\text{CR} \times \text{CF} \times \text{ET} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{SA} \times \text{EV} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Cancer Ingestion Intake} = 3.91\text{E-}09$$

$$\text{Cancer Dermal Intake} = 2.19\text{E-}01$$

$$\text{Noncancer Ingestion Intake} = 1.37\text{E-}07$$

$$\text{Noncancer Dermal Intake} = 7.67\text{E+}00$$

TABLE 4.21.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Resident	Child	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = $\frac{CS \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
				IR-S	Ingestion Rate	100	mg/day	(1)	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1993	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	2	years	USEPA, 1993	
				BW	Body Weight	15	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989					
Dermal	Resident	Child	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = $\frac{CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
				CF3	Conversion Factor 3	1.00E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	2,800	cm2	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.04	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	2	years	USEPA, 1993	
				BW	Body Weight	15	kg	USEPA, 1989	
AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989					
AT-N	Averaging Time (Non-Cancer)	730	days	USEPA, 1989					

Sources:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10, December.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (IR-S \times CF3 \times FI \times EF \times ED)/(BW \times AT)$$

$$\text{Dermal Intake} = (CF3 \times SA \times SSAF \times EF \times ED)/(BW \times AT)$$

$$\text{Cancer Ingestion Intake} = 7.83E-09$$

$$\text{Cancer Dermal Intake} = 8.77E-09$$

$$\text{Noncancer Ingestion Intake} = 2.74E-07$$

$$\text{Noncancer Dermal Intake} = 3.07E-07$$

TABLE 4.22.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Surface/Subsurface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Resident	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = <u>$CS \times IRS \times CF3 \times FI \times EF \times ED$</u> BW x AT
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1993	
				EF	Exposure Frequency	234	days/year	USEPA, 1993	
				ED	Exposure Duration	7	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	
Dermal	Resident	Adult	Site 3	CS	Chemical concentration in soil	Max or 95% UCL	mg/kg	USEPA, 2002	Dermally Absorbed Dose (mg/kg/day) = <u>$CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED$</u> BW x AT
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm ²	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.01	mg/cm ² /event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	234	days/year	USEPA, 1993	
				ED	Exposure Duration	7	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989					

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
- USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
- USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.
- USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Incidental Ingestion Intake} = (IR-S \times CF3 \times FI \times EF \times ED) / (BW \times AT)$$

$$\text{Dermal Intake} = (CF3 \times SA \times SSAF \times EF \times ED) / (BW \times AT)$$

$$\text{Cancer Ingestion Intake} = 4.58E-08$$

$$\text{Cancer Dermal Intake} = 5.22E-08$$

$$\text{Noncancer Ingestion Intake} = 4.58E-07$$

$$\text{Noncancer Dermal Intake} = 5.22E-07$$

TABLE 4.23.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Groundwater

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Residents	Adult	Site 3	CGW	Chemical Concentration in Groundwater	Average	ug/L	USEPA 4, 2000	Chronic Daily Intake (CDI) (mg/kg/day) = $\frac{CGW \times CF \times IR-GW \times EF \times ED}{BW \times AT}$
				CF	Conversion Factor	0.001	mg/ug	--	
				IR-GW	Ingestion Rate of Groundwater	1.4	L/day	USEPA, 1993	
				EF	Exposure Frequency	234	days/year	USEPA, 1993	
				ED	Exposure Duration	7	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989					
Dermal	Residents	Adult	Site 3	Daevent	Dermally Absorbed Dose per Event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = $\frac{DAevent \times EV \times EF \times ED \times SA}{BW \times AT}$ See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	18,000	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				ET	Exposure Time	0.25	hours/day	USEPA, 2004	
				EF	Exposure Frequency	234	days/year	USEPA, 1993	
				ED	Exposure Duration	7	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA Region 4, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Ingestion Intake = (IR-GW x EF x ED)/(BW x AT)

Dermal Intake = (SA x EV x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 1.28E-06

Cancer Dermal Intake = 1.65E+01

Noncancer Ingestion Intake = 1.28E-05

Noncancer Dermal Intake = 1.65E+02

TABLE 4.24.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Future
Medium: Surface Water
Exposure Medium: Surface Water

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Resident	Adult	Site 3	CW	Chemical Concentration in Water	Max or 95% UCL	ug/L	USEPA, 2002	Chronic Daily Intake (CDI) (mg/kg/day) = <u>CW x CF x IR-GW x EF x ED</u> BW x AT
				CR	Contact Rate	0.01	L/hour	USEPA 4, 2000	
				CF	Conversion factor	0.001	ug/mg	--	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	15	events/year	(1)	
				ED	Exposure Duration	7	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989					
Dermal	Resident	Adult	Site 3	DAevent	Absorbed dose per event	Calculated	mg/cm2-event	USEPA, 2004	Dermally Absorbed Dose (mg/kg/day) = <u>DAevent x EV x EF x ED x SA</u> BW x AT See text for calculation of DAevent.
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				ET	Exposure Time	1	hours/event	(1)	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	7	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989					

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

Sources:

USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. EPA/540/1-86/060.

USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.

USEPA Region 4, 2000: Supplement Guidance to RAGS: Region 4 Bulletins.

USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.

USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

$$\text{Ingestion Intake} = (\text{CR} \times \text{CF} \times \text{ET} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Dermal Intake} = (\text{SA} \times \text{EV} \times \text{EF} \times \text{ED}) / (\text{BW} \times \text{AT})$$

$$\text{Cancer Ingestion Intake} = 5.87\text{E-}10$$

$$\text{Cancer Dermal Intake} = 3.35\text{E-}01$$

$$\text{Noncancer Ingestion Intake} = 5.87\text{E-}09$$

$$\text{Noncancer Dermal Intake} = 3.35\text{E+}00$$

TABLE 4.25.CTE
VALUES USED FOR DAILY INTAKE CALCULATIONS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Medium: Sediment
Exposure Medium: Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/Reference	Intake Equation/Model Name
Ingestion	Resident	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Intake (mg/kg/day) = $\frac{CSs \times IRS \times CF3 \times FI \times EF \times ED}{BW \times AT}$
				IR-S	Ingestion Rate	50	mg/day	USEPA, 1993	
				CF3	Conversion Factor 3	1.0E-06	kg/mg	--	
				FI	Fraction Ingested	1	unitless	USEPA, 1993	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	7	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989					
Dermal	Resident	Adult	Site 3	CS	Chemical concentration in sediment	Max or 95% UCL	mg/kg	USEPA, 2002	Dermal Absorbed Dose (mg/kg/day) = $\frac{CS \times CF3 \times SA \times SSAF \times DABS \times EF \times ED}{BW \times AT}$
				CF3	Conversion Factor 3	1.00E-06	kg/mg	--	
				SA	Skin Surface Available for Contact	5,700	cm2	USEPA, 2004	
				SSAF	Soil to Skin Adherence Factor	0.01	mg/cm2/event	USEPA, 2004	
				DABS	Absorption Factor	Chemical Specific	unitless	USEPA, 2004	
				EF	Exposure Frequency	15	days/year	(1)	
				ED	Exposure Duration	7	years	USEPA, 1993	
				BW	Body Weight	70	kg	USEPA, 1989	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	2,555	days	USEPA, 1989	

Notes:

1 - Assume 2 to 3 days a week in warm weather months for RME . CTE is one half the RME.

Sources:

- USEPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A.
- USEPA, 1991: Risk Assessment Guidance for Superfund - Supplemental Guidance- Standard Default Exposure Factors Interim Final.
- USEPA, 2002: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites. OSWER 9285.6-10.
- USEPA, 1993: Superfund Standard Default Exposure Factors for the Central Tendency and Reasonable Maximum Exposure.
- USEPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Final. EPA/540/R/99/005.

Unit Intake Calculations

Incidental Ingestion Intake = (IR-S x CF3 x FI x EF x ED)/(BW x AT)

Dermal Intake = (CF3 x SA x SSAF x EF x ED)/(BW x AT)

Cancer Ingestion Intake = 2.94E-09

Cancer Dermal Intake = 3.35E-09

Noncancer Ingestion Intake = 2.94E-08

Noncancer Dermal Intake = 3.35E-08

**TABLE 4.26
INTERMEDIATE VARIABLES FOR CALCULATING DA(EVENT)
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Chemical of Potential Concern	Media	Dermal Absorption Fraction (soil)	FA	Kp		T(event)		Tau		T*		B
			Value	Value	Units	Value	Units	Value	Units	Value	Units	Value
Volatile Organic Compounds												
1,2,4-Trichlorobenzene	Groundwater	NA	1	6.6E-02	cm/hr	(1)	hr	1.1E+00	hr	2.7E+00	hr	3.4E-01
1,2-Dichloroethane	Groundwater	NA	1	4.2E-03	cm/hr	(1)	hr	3.8E-01	hr	9.2E-01	hr	1.6E-02
Benzene	Groundwater	NA	1	1.5E-02	cm/hr	(1)	hr	2.9E-01	hr	7.0E-01	hr	5.1E-02
cis-1,2-Dichloroethene	Groundwater	NA	1	1.1E-02	cm/hr	(1)	hr	3.7E-01	hr	8.8E-01	hr	4.1E-02
Methylene Chloride	Groundwater	NA	1	3.5E-03	cm/hr	(1)	hr	3.2E-01	hr	7.6E-01	hr	1.3E-02
trans-1,2-Dichloroethene	Groundwater	NA	1	7.7E-03	cm/hr	(1)	hr	3.7E-01	hr	8.9E-01	hr	2.9E-02
Trichloroethene	Groundwater	NA	1	1.2E-02	cm/hr	(1)	hr	5.8E-01	hr	1.4E+00	hr	5.1E-02
Vinyl Chloride	Groundwater	NA	1	5.6E-03	cm/hr	(1)	hr	2.4E-01	hr	5.7E-01	hr	1.7E-02
Semivolatile Organic Compounds												
Benzo(a)pyrene	Soil	0.13	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	Surface Water	NA	0.8	2.5E-02	cm/hr	(1)	hr	1.7E+01	hr	4.0E+01	hr	1.9E-01
Inorganics												
Aluminum	Groundwater, Sediment	0	NA	1.0E-03	cm/hr	(1)	hr	NA	NA	NA	NA	NA
Arsenic	Soil, Groundwater, Sediment	0.03	NA	1.0E-03	cm/hr	(1)	hr	NA	NA	NA	NA	NA
Chromium	Groundwater	NA	NA	2.0E-03	cm/hr	(1)	hr	NA	NA	NA	NA	NA
Iron	Soil, Groundwater, Surface Water, Sediment	0	NA	1.0E-03	cm/hr	(1)	hr	NA	NA	NA	NA	NA
Manganese	Groundwater, Surface Water	0	NA	1.0E-03	cm/hr	(1)	hr	NA	NA	NA	NA	NA
Thallium	Groundwater	NA	NA	1.0E-03	cm/hr	(1)	hr	NA	NA	NA	NA	NA
Vanadium	Soil, Groundwater, Sediment	0	NA	1.0E-03	cm/hr	(1)	hr	NA	NA	NA	NA	NA

Notes:
All values from EPA's Risk Assessment Guidance for Superfund Volume 1: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Final, July 2004.
1 - T(event) for exposures to groundwater by construction worker is 4 hours for RME and 2 hours for CTE and residents is 0.33 hour for RME and 0.25 hour for CTE.

All receptors are assumed to be exposed to surface water 1 hour a day for RME and CTE.

FA = Fraction Absorbed Water

Kp = Dermal Permeability Coefficient of Compound in Water

T(event) = Event Duration

Tau = Lag Time

T* = Time to Reach Steady-State

B = Dimensionless Ratio of the Permeability Coefficient of a Compound Through the Stratum Corneum Relative to its Permeability Coefficient Across the Viable Epidermis

NA = Not applicable.

RAGS Part D Table 5
Non-Cancer Toxicity Data

LIST OF TABLES
RAGS PART D TABLE 5
NON-CANCER TOXICITY DATA

Table No.

- 5-1 Non-Cancer Toxicity Data - Oral/Dermal
- 5-2 Non-Cancer Toxicity Data - Inhalation

**TABLE 5.1
NON-CANCER TOXICITY DATA -- ORAL/DERMAL
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal ⁽¹⁾	Absorbed RfD for Dermal ⁽²⁾		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD:Target Organ(s)	
		Value	Units		Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds										
1,2,4-Trichlorobenzene	Chronic	1.0E-02	mg/kg/day	1	1.0E-02	mg/kg/day	Kidney	1000/1	IRIS	1/04/2008
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	Chronic	4.0E-03	mg/kg/day	1	4.0E-03	mg/kg/day	Blood	300/1	IRIS	1/04/2008
Chloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	Chronic	1.0E-02	mg/kg/day	1	1.0E-02	mg/kg/day	Blood	3000	PPRTV	3/01/2006
Methylene Chloride	Chronic	6.0E-02	mg/kg/day	1	6.0E-02	mg/kg/day	Liver	100/1	IRIS	1/04/2008
trans-1,2-Dichloroethene	Chronic	2.0E-02	mg/kg/day	1	2.0E-02	mg/kg/day	Blood	1000/1	IRIS	1/04/2008
Trichloroethene	Chronic	5.0E-01	mg/kg/day	1	5.0E-01	mg/kg/day	Liver	NA	CA EPA	12/2002
Vinyl Chloride	Chronic	3.0E-03	mg/kg/day	1	3.0E-03	mg/kg/day	Liver	30/1	IRIS	1/04/2008
Semivolatile Organic Compounds										
Benzo(a)pyrene Equivalents	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	Chronic	2.0E-02	mg/kg/day	1	2.0E-02	mg/kg/day	Liver	1000/1	IRIS	1/04/2008
Inorganics										
Aluminum	Chronic	1.0E+00	mg/kg/day	1	1.0E+00	mg/kg/day	CNS	100	PPRTV	10/23/2006
Arsenic	Chronic	3.0E-04	mg/kg/day	1	3.0E-04	mg/kg/day	Skin, CVS	3/1	IRIS	1/04/2008
Chromium	Chronic	3.0E-03	mg/kg/day	0.025	7.5E-05	mg/kg/day	Fetotoxicity, GS, Bone	300/3	IRIS	1/04/2008
Iron	Chronic	7.0E-01	mg/kg/day	1	7.0E-01	mg/kg/day	GS	1.5	PPRTV	9/11/2006
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	Chronic	2.4E-02	mg/kg/day	0.04	9.6E-04	mg/kg/day	CNS	1/3	IRIS	1/04/2008
Thallium ⁽⁵⁾	Chronic	7.0E-05	mg/kg/day	1	7.0E-05	mg/kg/day	Liver	3000	USEPA III	10/11/2007
Vanadium	Chronic	1.0E-03	mg/kg/day	0.026	2.6E-05	mg/kg/day	Kidney	300	USEPA III	10/11/2007

Notes:

- 1 - U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
- 2 - Adjusted dermal RfD = Oral RfD x Oral Absorption Efficiency for Dermal.
- 3 - Values are for cadmium water.
- 4 - Values are for mercuric chloride.
- 5 - Weight adjustment of the IRIS value.

Definitions:

- CNS = Central Nervous System
 CVS = Cardiovascular system
 EPA III = U.S. EPA Region 3 RBC Table, October 11, 2007.
 GS = Gastrointestinal
 IRIS = Integrated Risk Information System
 NA = Not Applicable
 PPRTV - Provisional Peer Review Toxicity Value

**TABLE 5.2
NON-CANCER TOXICITY DATA -- INHALATION
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Chemical of Potential Concern	Chronic/ Subchronic	Inhalation RfC		Extrapolated RfD ⁽¹⁾		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC : Target Organ(s)	
		Value	Units	Value	Units			Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds									
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	Chronic	2.5E+00	mg/m ³	7.0E-01	(mg/kg/day)	NA	NA	USEPA III	10/11/2007
Benzene	Chronic	3.0E-02	mg/m ³	8.6E-03	(mg/kg/day)	Blood	300/1	IRIS	1/04/2008
Chloromethane	Chronic	0.09	mg/m ³	2.6E-02	(mg/kg/day)	CNS	1000/1	IRIS	1/04/2008
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	Chronic	1.1E+00	mg/m ³	3.0E-01	(mg/kg/day)	Liver	NA	USEPA III	10/11/2007
trans-1,2-Dichloroethene	Chronic	6.0E-02	mg/m ³	1.7E-02	(mg/kg/day)	Blood	3000	PPRTV	3/1/2006
Trichloroethene	Chronic	6.0E-01	mg/m ³	1.7E-01	(mg/kg/day)	Liver	NA	CA EPA	12/2002
Vinyl Chloride	Chronic	1.0E-01	mg/m ³	2.9E-02	(mg/kg/day)	Liver	30/1	IRIS	1/04/2008
Semivolatile Organic Compounds									
Benzo(a)pyrene Equivalents	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics									
Aluminum	Chronic	5.0E-03	mg/m ³	1.4E-03	(mg/kg/day)	CNS	300	PPRTV	10/23/2006
Arsenic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	Chronic	1.0E-04	mg/m ³	2.9E-05	(mg/kg/day)	Lungs	300/1	IRIS	1/04/2008
Iron	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	Chronic	5.0E-05	mg/m ³	1.4E-05	(mg/kg/day)	CNS	1000/1	IRIS	1/04/2008
Thallium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

1 - Extrapolated RfD = RfC *20m³/day / 70 kg

Definitions:

CNS = Central Nervous System
EPA III = U.S. EPA Region 3 RfC Table, April 6, 2007.
HEAST= Health Effects Assessment Summary Tables
IRIS = Integrated Risk Information System
NA = Not Applicable
PPRTV - Provisional Peer Review Toxicity Value

RAGS Part D Table 6

Cancer Toxicity Data

LIST OF TABLES
RAGS PART D TABLE 6
CANCER TOXICITY DATA

Table No.

- 6-1 Cancer Toxicity Data - Oral/Dermal
- 6-2 Cancer Toxicity Data - Inhalation

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
NCBC GULFPORT
GULFPORT, MISSISSIPPI

Chemical of Potential Concern	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal ⁽¹⁾	Absorbed Cancer Slope Factor for Dermal ⁽²⁾		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
	Value	Units		Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds								
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	D	IRIS	1/04/2008
1,2-Dichloroethane	9.1E-02	(mg/kg/day) ⁻¹	1	9.1E-02	(mg/kg/day) ⁻¹	B2	IRIS	1/04/2008
Benzene	5.5E-02	(mg/kg/day) ⁻¹	1	5.5E-02	(mg/kg/day) ⁻¹	A	IRIS	1/04/2008
Chloromethane	NA	NA	NA	NA	NA	D	IRIS	1/04/2008
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	D	IRIS	1/04/2008
Methylene Chloride	7.5E-03	(mg/kg/day) ⁻¹	1	7.5E-03	(mg/kg/day) ⁻¹	B2	IRIS	1/04/2008
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	1.3E-02	(mg/kg/day) ⁻¹	1	1.3E-02	(mg/kg/day) ⁻¹	C	CA EPA	12/2002
Vinyl Chloride (early life)	1.5E+00	(mg/kg/day) ⁻¹	1	1.5E+00	(mg/kg/day) ⁻¹	A	IRIS	1/04/2008
Vinyl Chloride (adult)	7.2E-01	(mg/kg/day) ⁻¹	1	7.2E-01	(mg/kg/day) ⁻¹	A	IRIS	1/04/2008
Semivolatile Organic Compounds								
Benzo(a)pyrene Equivalents	7.3E+00	(mg/kg/day) ⁻¹	1	7.3E+00	(mg/kg/day) ⁻¹	B2	IRIS	1/04/2008
Bis(2-ethylhexyl)phthalate	1.4E-02	(mg/kg/day) ⁻¹	1	1.4E-02	(mg/kg/day) ⁻¹	B2	IRIS	1/04/2008
Inorganics								
Aluminum	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	B1	IRIS	1/04/2008
Iron	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	D	IRIS	1/04/2008
Lead	NA	NA	NA	NA	NA	B2	IRIS	1/04/2008
Manganese	NA	NA	NA	NA	NA	D	IRIS	1/04/2008
Thallium	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

- 1 - U.S. EPA, 2004: Risk Assessment Guidance for Superfund (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim. EPA/540/R/99/005.
- 2 - Adjusted cancer slope factor for dermal =
Oral cancer slope factor / Oral Absorption Efficiency for Dermal.

EPA Group:

- A - Human carcinogen.
- B1 - Probable human carcinogen - indicates that limited human data are available.
- B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans .
- C - Possible human carcinogen.
- D - Not classifiable as a human carcinogen.
- E - Evidence of noncarcinogenicity.

USEPA(1) = Draft Trichloroethylene Health Risk Assessment: Synthesis and Characterization, August 2001.

USEPA(2) = U.S. EPA, Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons, July 1993, EPA/600/R-93/089.

IRIS = Integrated Risk Information System.

NA = Not Available.

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
NCBC GULFPORT
GULFPORT, MISSISSIPPI
PAGE 1 OF 2

Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor ⁽¹⁾		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)
Volatile Organic Compounds							
1,2,4-Trichlorobenzene	NA	NA	NA	NA	D	IRIS	1/04/2008
1,2-Dichloroethane	2.6E-05	(ug/m ³) ⁻¹	9.1E-02	(mg/kg/day) ⁻¹	B2	IRIS	1/04/2008
Benzene	7.8E-06	(ug/m ³) ⁻¹	2.7E-02	(mg/kg/day) ⁻¹	A	IRIS	1/04/2008
Chloromethane	NA	NA	NA	NA	D	IRIS	1/04/2008
cis-1,2-Dichloroethene	NA	NA	NA	NA	D	IRIS	1/04/2008
Methylene Chloride	4.7E-07	(ug/m ³) ⁻¹	1.6E-03	(mg/kg/day) ⁻¹	B2	IRIS	1/04/2008
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	2.0E-03	(mg/m3)-1	7.0E-03	(mg/kg/day)-1	C	CA EPA	12/2002
Vinyl Chloride (early life)	8.8E-06	(ug/m ³) ⁻¹	3.1E-02	(mg/kg/day) ⁻¹	A	IRIS	1/04/2008
Vinyl Chloride (adult)	4.4E-06	(ug/m ³) ⁻¹	1.5E-02	(mg/kg/day) ⁻¹	A	IRIS	1/04/2008
Semivolatile Organic Compounds							
Benzo(a)pyrene Equivalents	8.9E-04	(ug/m ³) ⁻¹	3.1E+00	(mg/kg/day) ⁻¹	NA	USEPA III	10/11/2007
Bis(2-ethylhexyl)phthalate	NA	NA	NA	NA	NA	NA	NA
Inorganics							
Aluminum	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA
Cadmium	1.8E-03	(ug/m ³) ⁻¹	6.3E+00	(mg/kg/day) ⁻¹	B1	IRIS	1/04/2008
Iron	NA	NA	NA	NA	NA	NA	NA
Chromium	1.2E-02	(ug/m ³) ⁻¹	4.2E+01	(mg/kg/day) ⁻¹	A	IRIS	1/04/2008
Lead	NA	NA	NA	NA	B2	IRIS	1/04/2008
Manganese	NA	NA	NA	NA	D	IRIS	1/04/2008
Thallium	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA

**TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
NCBC GULFPORT
GULFPORT, MISSISSIPPI
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Chemical of Potential Concern	Unit Risk		Inhalation Cancer Slope Factor ⁽¹⁾		Weight of Evidence/ Cancer Guideline Description	Unit Risk : Inhalation CSF	
	Value	Units	Value	Units		Source(s)	Date(s) (MM/DD/YYYY)

Notes:

1 - Inhalation CSF = Unit Risk * 70 kg / 20m³/day.

Definitions:

IRIS = Integrated Risk Information System.

NA = Not Available.

USEPA III = U.S. EPA Region 3 RBC Table, April 6, 2007.

USEPA(1) = Draft Trichloroethylene Health Risk Assessment: Synthesis and Characterization, August 2001.

EPA Group:

A - Human carcinogen.

B1 - Probable human carcinogen - indicates that limited human data are available.

B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans .

C - Possible human carcinogen.

D - Not classifiable as a human carcinogen.

E - Evidence of noncarcinogenicity.

RAGS Part D Table 7

Calculation Of Cancer Risks and Non-Cancer Hazards

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RAGS PART D TABLE 7
CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS

Table No.

REASONABLE MAXIMUM EXPOSURES

7.1.RME	Construction Workers
7.2.RME	Maintenance Workers
7.3.RME	Industrial Workers
7.4.RME	Adolescent Trespassers
7.5.RME	Adult Trespassers
7.6.RME	Child Residents
7.7.RME	Adult Residents

CENTRAL TENDENCY EXPOSURES

7.1.CTE	Construction Workers
7.2.CTE	Maintenance Workers
7.3.CTE	Industrial Workers
7.4.CTE	Adolescent Trespassers
7.5.CTE	Adult Trespassers
7.6.CTE	Child Residents
7.7.CTE	Adult Residents

TABLE 7.1.RME
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
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Scenario Timeframe: Future
 Receptor Population: Construction Workers
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	1.2E-08	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	8.9E-08	8.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--			
				Arsenic	3.66	mg/kg	1.7E-07	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	2.5E-07	1.2E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.04			
				Iron	7331	mg/kg	3.4E-04	(mg/kg/day)	NA	(mg/kg/day)-1	--	2.4E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.03			
				Vanadium	12.0	mg/kg	5.5E-07	(mg/kg/day)	NA	(mg/kg/day)-1	--	3.9E-05	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.04			
				Exp. Route Total							3.4E-07					0.1			
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	4.8E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	3.5E-08	3.3E-07	(mg/kg/day)	NA	(mg/kg/day)	--			
				Arsenic	3.66	mg/kg	1.5E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	2.3E-08	1.1E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.004			
				Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--			
				Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--			
				Exp. Route Total							5.8E-08					0.004			
			Exposure Point Total							4.0E-07						0.1			
			Exposure Medium Total							4.0E-07						0.1			
			Medium Total							4.0E-07						0.1			
Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	5.4E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	8.1E-08	3.8E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01			
				Iron	2905	mg/kg	1.3E-04	(mg/kg/day)	NA	(mg/kg/day)-1	--	9.4E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.01			
				Vanadium	7.48	mg/kg	3.4E-07	(mg/kg/day)	NA	(mg/kg/day)-1	--	2.4E-05	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.02			
				Exp. Route Total						8.1E-08						0.05			
				Dermal	Arsenic	1.17	mg/kg	4.9E-09	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	7.3E-09	3.4E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001		
			Iron		2905	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--			
			Vanadium		7.48	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--			
			Exp. Route Total								7.3E-09					0.001			
			Exposure Point Total								8.8E-08					0.05			
			Exposure Medium Total							8.8E-08					0.05				
			Medium Total							8.8E-08					0.05				
			Groundwater	Groundwater	Site 3	Dermal	1,2,4-Trichlorobenzene	2.23	ug/L	4.8E-08	(mg/kg/day)	NA	(mg/kg/day)-1	--	3.4E-06	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.0003
							1,2-Dichloroethane	2.06	ug/L	2.3E-09	(mg/kg/day)	9.1E-02	(mg/kg/day)-1	2.1E-10	1.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--
Benzene	2.22	ug/L					8.1E-09	(mg/kg/day)	5.5E-02	(mg/kg/day)-1	4.4E-10	5.7E-07	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.0001			
cis-1,2-Dichloroethene	132	ug/L					3.7E-07	(mg/kg/day)	NA	(mg/kg/day)-1	--	2.6E-05	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.003			
Methylene Chloride	2.58	ug/L					2.3E-09	(mg/kg/day)	7.5E-03	(mg/kg/day)-1	1.7E-11	1.6E-07	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.000003			
trans-1,2-Dichloroethene	11.6	ug/L					2.3E-08	(mg/kg/day)	NA	(mg/kg/day)-1	--	1.6E-06	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00008			
Trichloroethene	12.8	ug/L					4.1E-08	(mg/kg/day)	1.3E-02	(mg/kg/day)-1	5.4E-10	2.9E-06	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.000006			
Vinyl Chloride	17.1	ug/L					2.3E-08	(mg/kg/day)	7.2E-01	(mg/kg/day)-1	1.7E-08	1.6E-06	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.0005			
Aluminum	799	ug/L					1.8E-07	(mg/kg/day)	NA	(mg/kg/day)-1	--	1.2E-05	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00001			
Arsenic	11.5	ug/L					2.5E-09	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	3.8E-09	1.8E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0006			
Chromium	3.24	ug/L					1.4E-09	(mg/kg/day)	NA	(mg/kg/day)-1	--	1.0E-07	(mg/kg/day)	7.5E-05	(mg/kg/day)	0.001			
Iron	15878	ug/L					3.5E-06	(mg/kg/day)	NA	(mg/kg/day)-1	--	2.5E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0004			
Lead	1.51	ug/L					3.3E-10	(mg/kg/day)	NA	(mg/kg/day)-1	--	2.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--			
Manganese	137	ug/L					3.0E-08	(mg/kg/day)	NA	(mg/kg/day)-1	--	2.1E-06	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.002			
Vanadium	5.33	ug/L					1.2E-09	(mg/kg/day)	NA	(mg/kg/day)-1	--	8.3E-08	(mg/kg/day)	2.6E-05	(mg/kg/day)	0.003			
Exp. Route Total												2.2E-08				0.01			
Exposure Point Total												2.2E-08				0.01			
Exposure Medium Total												2.2E-08				0.01			

TABLE 7.1.RME
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
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Scenario Timeframe: Future
 Receptor Population: Construction Workers
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Groundwater	Air	Site 3	Inhalation	1,2,4-Trichlorobenzene	5.9E-5	mg/m3	9.9E-09	(mg/kg/day)	NA	(mg/kg/day)-1	--	7.0E-07	(mg/kg/day)	NA	(mg/kg/day)	--	
				1,2-Dichloroethane	7.2E-5	mg/m3	1.2E-08	(mg/kg/day)	9.1E-02	(mg/kg/day)-1	1.1E-09	8.5E-07	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.000001	
				Benzene	9.2E-5	mg/m3	1.5E-08	(mg/kg/day)	2.7E-02	(mg/kg/day)-1	4.2E-10	1.1E-06	(mg/kg/day)	8.6E-03	(mg/kg/day)	0.0001	
				cis-1,2-Dichloroethene	0.005	mg/m3	8.2E-07	(mg/kg/day)	NA	(mg/kg/day)-1	--	5.8E-05	(mg/kg/day)	NA	(mg/kg/day)	--	
				Methylene Chloride	1.0E-4	mg/m3	1.7E-08	(mg/kg/day)	1.6E-03	(mg/kg/day)-1	2.7E-11	1.2E-06	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.000004	
				trans-1,2-Dichloroethene	4.3E-4	mg/m3	7.3E-08	(mg/kg/day)	NA	(mg/kg/day)-1	--	5.1E-06	(mg/kg/day)	1.7E-02	(mg/kg/day)	0.0003	
				Trichloroethene	4.12E-4	mg/m3	6.9E-08	(mg/kg/day)	7.0E-03	(mg/kg/day)-1	4.8E-10	4.8E-06	(mg/kg/day)	1.7E-01	(mg/kg/day)	0.00003	
				Vinyl Chloride	8.0E-4	mg/m3	1.3E-07	(mg/kg/day)	1.5E-02	(mg/kg/day)-1	2.0E-09	9.4E-06	(mg/kg/day)	2.9E-02	(mg/kg/day)	0.0003	
				Aluminum	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	1.4E-03	(mg/kg/day)	--	
				Arsenic	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	1.5E+01	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--	
				Chromium	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	4.2E+01	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	2.9E-05	(mg/kg/day)	--	
				Iron	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--	
				Lead	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--	
				Manganese	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	1.4E-05	(mg/kg/day)	--	
				Vanadium	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--	
Exp. Route Total										4.1E-09					0.0008		
Exposure Point Total										4.1E-09						0.0008	
Exposure Medium Total										4.1E-09						0.0008	
Medium Total										2.6E-08						0.01	
Surface Water	Surface Water	Site 3	Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	3.2E-09	(mg/kg/day)	1.4E-02	(mg/kg/day)-1	4.5E-11	2.2E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00001	
				Iron	3680	ug/L	6.2E-07	(mg/kg/day)	NA	(mg/kg/day)-1	--	4.3E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00006	
				Manganese	98.2	ug/L	1.6E-08	(mg/kg/day)	NA	(mg/kg/day)-1	--	1.2E-06	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.00005	
				Exp. Route Total									4.5E-11				
			Dermal	Bis(2-ethylhexyl)phthalate	19.0	ug/L	2.4E-07	(mg/kg/day)	1.4E-02	(mg/kg/day)-1	3.3E-09	1.7E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0008	
				Iron	3680	ug/L	2.0E-07	(mg/kg/day)	NA	(mg/kg/day)-1	--	1.4E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00002	
				Manganese	98.2	ug/L	5.4E-09	(mg/kg/day)	NA	(mg/kg/day)-1	--	3.8E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0004	
			Exp. Route Total									3.3E-09					0.001
			Exposure Point Total									3.4E-09					0.001
			Exposure Medium Total									3.4E-09					0.001
Medium Total									3.4E-09					0.001			
Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	6.0E-05	(mg/kg/day)	NA	(mg/kg/day)-1	--	4.2E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.004	
				Arsenic	7.83	mg/kg	4.3E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	6.5E-08	3.0E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01	
				Iron	7435	mg/kg	4.1E-05	(mg/kg/day)	NA	(mg/kg/day)-1	--	2.9E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.004	
				Vanadium	17.1	mg/kg	9.5E-08	(mg/kg/day)	NA	(mg/kg/day)-1	--	6.6E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.007	
				Exp. Route Total									6.5E-08				
			Dermal	Aluminum	10752	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--	
				Arsenic	7.83	mg/kg	3.9E-09	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	5.8E-09	2.7E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0009	
				Iron	7435	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
				Vanadium	17.1	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
			Exp. Route Total									5.8E-09					0.0009
Exposure Point Total									7.1E-08					0.03			
Exposure Medium Total									7.1E-08					0.03			
Medium Total									7.1E-08					0.03			
Total of Receptor Risks Across All Media										5.9E-07	Total of Receptor Hazards Across All Media				0.2		

TABLE 7.2.RME
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
 Receptor Population: Maintenance Workers
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units				
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	8.9E-09	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	6.5E-08	2.5E-08	(mg/kg/day)	NA	(mg/kg/day)	--	
				Arsenic	3.66	mg/kg	1.2E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.8E-07	3.4E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001	
				Iron	7331	mg/kg	2.5E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.9E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0010	
				Vanadium	12.0	mg/kg	4.0E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.1E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.001	
				Exp. Route Total								2.5E-07					0.003
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	7.6E-09	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	5.6E-08	2.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--	
				Arsenic	3.66	mg/kg	2.4E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.6E-08	6.8E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002	
				Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
				Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
				Exp. Route Total								9.2E-08					0.0002
			Exposure Point Total									3.4E-07					0.003
			Exposure Medium Total									3.4E-07					0.003
			Medium Total														
			Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	3.9E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	5.9E-08	1.1E-07	(mg/kg/day)	3.0E-04
Iron	2905	mg/kg					9.7E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.7E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0004	
Vanadium	7.48	mg/kg					2.5E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	7.0E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0007	
Exp. Route Total												5.9E-08					0.001
Dermal	Arsenic	1.17					mg/kg	7.8E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.2E-08	2.2E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00007
	Iron	2905				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
	Vanadium	7.48				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
Exp. Route Total											1.2E-08					0.00007	
Exposure Point Total												7.1E-08					0.002
Exposure Medium Total												7.1E-08					0.002
Medium Total																	
Surface Water	Surface Water	Site 3	Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	6.4E-08	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	8.9E-10	1.8E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000009	
				Iron	3680	ug/L	1.2E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.5E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00005	
				Manganese	98.2	ug/L	3.3E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	9.2E-07	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.00004	
				Exp. Route Total								8.9E-10					0.00010
				Dermal	Bis(2-ethylhexyl)phthalate	19.0	ug/L	4.7E-06	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	6.6E-08	1.3E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0007
			Iron		3680	ug/L	4.1E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.1E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00002	
			Manganese		98.2	ug/L	1.1E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.0E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0003	
			Exp. Route Total								6.6E-08					0.0010	
			Exposure Point Total									6.7E-08					0.001
			Exposure Medium Total									6.7E-08					0.001
Medium Total																	
Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	3.6E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.0E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.001	
				Arsenic	7.83	mg/kg	2.6E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.9E-07	7.4E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002	
				Iron	7435	mg/kg	2.5E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	7.0E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0010	
				Vanadium	17.1	mg/kg	5.7E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.6E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.002	
				Exp. Route Total								3.9E-07					0.006
			Dermal	Aluminum	10752	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--	
				Arsenic	7.83	mg/kg	5.2E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	7.8E-08	1.5E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0005	
				Iron	7435	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
				Vanadium	17.1	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
			Exp. Route Total								7.8E-08					0.0005	
Exposure Point Total									4.7E-07					0.007			
Exposure Medium Total									4.7E-07					0.007			
Medium Total																	
Total of Receptor Risks Across All Media										9.5E-07	Total of Receptor Hazards Across All Media				0.01		

TABLE 7.3.RME
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
 Receptor Population: Industrial Workers
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	9.3E-08	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	6.8E-07	2.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--	
				Arsenic	3.66	mg/kg	1.3E-06	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.9E-06	3.6E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01	
				Iron	7331	mg/kg	2.6E-03	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	7.2E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.01	
				Vanadium	12.0	mg/kg	4.2E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.2E-05	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.01	
				Exp. Route Total								2.6E-06					0.03
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	7.9E-08	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	5.8E-07	2.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--	
				Arsenic	3.66	mg/kg	2.5E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.8E-07	7.1E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002	
				Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
				Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
				Exp. Route Total								9.6E-07					0.002
				Exposure Point Total								3.6E-06					0.04
				Exposure Medium Total								3.6E-06					0.04
			Medium Total														0.04
			Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	4.1E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	6.1E-07	1.1E-06	(mg/kg/day)	3.0E-04
Iron	2905	mg/kg					1.0E-03	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.8E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.004	
Vanadium	7.48	mg/kg					2.6E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	7.3E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.007	
	Exp. Route Total												6.1E-07				0.02
Dermal	Arsenic	1.17				mg/kg	8.1E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.2E-07	2.3E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0008	
	Iron	2905				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
	Vanadium	7.48				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
	Exp. Route Total											1.2E-07					0.0008
	Exposure Point Total											7.3E-07					0.02
	Exposure Medium Total											7.3E-07					0.02
Medium Total														0.02			
Surface Water	Surface Water	Site 3	Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	6.4E-08	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	8.9E-10	1.8E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000009	
				Iron	3680	ug/L	1.2E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.5E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00005	
				Manganese	98.2	ug/L	3.3E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	9.2E-07	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.00004	
					Exp. Route Total								8.9E-10				0.00010
			Dermal	Bis(2-ethylhexyl)phthalate	19.0	ug/L	4.7E-06	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	6.6E-08	1.3E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0007	
				Iron	3680	ug/L	4.1E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.1E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00002	
				Manganese	98.2	ug/L	1.1E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.0E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0003	
				Exp. Route Total								6.6E-08					0.0010
				Exposure Point Total								6.7E-08					0.001
				Exposure Medium Total								6.7E-08					0.001
Medium Total														0.001			
Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	1.8E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.0E-04	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.0005	
				Arsenic	7.83	mg/kg	1.3E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.0E-07	3.7E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001	
				Iron	7435	mg/kg	1.2E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.5E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0005	
				Vanadium	17.1	mg/kg	2.9E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	8.0E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0008	
				Exp. Route Total								2.0E-07					0.003
			Dermal	Aluminum	10752	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--	
				Arsenic	7.83	mg/kg	5.2E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	7.8E-08	1.5E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0005	
				Iron	7435	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
				Vanadium	17.1	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
				Exp. Route Total								7.8E-08					0.0005
	Exposure Point Total								2.7E-07					0.004			
	Exposure Medium Total								2.7E-07					0.004			
Medium Total														0.004			
Total of Receptor Risks Across All Media										4.6E-06	Total of Receptor Hazards Across All Media				0.06		

TABLE 7.4.RME
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
 Receptor Population: Trespassers
 Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units						
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	2.3E-08	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	1.7E-07	1.5E-07	(mg/kg/day)	NA	(mg/kg/day)	--			
				Arsenic	3.66	mg/kg	1.1E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.6E-07	6.7E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002			
				Iron	7331	mg/kg	2.1E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.3E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.002			
				Vanadium	12.0	mg/kg	3.4E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.2E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.002			
				Exp. Route Total								3.2E-07				0.006			
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	6.4E-09	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	4.7E-08	4.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--			
				Arsenic	3.66	mg/kg	2.0E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.1E-08	1.3E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0004			
				Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--			
				Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--			
				Exp. Route Total								7.8E-08				0.0004			
			Exposure Point Total								4.0E-07				0.007				
			Exposure Medium Total								4.0E-07				0.007				
			Medium Total								4.0E-07				0.007				
			Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	3.4E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	5.0E-08	2.1E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0007
Iron	2905	mg/kg					8.3E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.3E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0008			
Vanadium	7.48	mg/kg					2.1E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.4E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.001			
Exp. Route Total												5.0E-08				0.003			
Dermal	Arsenic	1.17					mg/kg	6.5E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	9.8E-09	4.2E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0001		
	Iron	2905				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--			
	Vanadium	7.48				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--			
	Exp. Route Total											9.8E-09				0.0001			
Exposure Point Total											6.0E-08				0.003				
Exposure Medium Total											6.0E-08				0.003				
Medium Total											6.0E-08				0.003				
Surface Water	Surface Water	Site 3				Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	2.7E-07	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	3.8E-09	1.7E-06	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00009
							Iron	3680	ug/L	5.3E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.4E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0005
							Manganese	98.2	ug/L	1.4E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	9.0E-06	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.0004
			Exp. Route Total									3.8E-09				0.0009			
			Dermal	Bis(2-ethylhexyl)phthalate	19.0		ug/L	4.0E-06	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	5.6E-08	2.5E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.001		
				Iron	3680	ug/L	3.4E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.2E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00003			
				Manganese	98.2	ug/L	9.2E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.8E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0006			
				Exp. Route Total								5.6E-08				0.002			
			Exposure Point Total								6.0E-08				0.003				
			Exposure Medium Total								6.0E-08				0.003				
			Medium Total								6.0E-08				0.003				
			Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	3.1E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.0E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.002
							Arsenic	7.83	mg/kg	2.2E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.4E-07	1.4E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.005
							Iron	7435	mg/kg	2.1E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.4E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.002
Vanadium	17.1	mg/kg					4.9E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.1E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.003			
Exp. Route Total												3.4E-07				0.01			
Dermal	Aluminum	10752				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--			
	Arsenic	7.83				mg/kg	4.4E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	6.6E-08	2.8E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0009			
	Iron	7435				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--			
	Vanadium	17.1				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--			
Exp. Route Total											6.6E-08				0.0009				
Exposure Point Total											4.0E-07				0.01				
Exposure Medium Total											4.0E-07				0.01				
Medium Total											4.0E-07				0.01				
Total of Receptor Risks Across All Media										9.2E-07	Total of Receptor Hazards Across All Media				0.03				

TABLE 7.5.RME
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
 Receptor Population: Trespassers
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units				
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	8.4E-09	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	6.2E-08	3.1E-08	(mg/kg/day)	NA	(mg/kg/day)	--	
				Arsenic	3.66	mg/kg	1.2E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.7E-07	4.3E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001	
				Iron	7331	mg/kg	2.3E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	8.6E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.001	
				Vanadium	12.0	mg/kg	3.8E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.4E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.001	
				Exp. Route Total								2.4E-07					0.004
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	4.4E-09	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	3.2E-08	1.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--	
				Arsenic	3.66	mg/kg	1.4E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.1E-08	5.1E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002	
				Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
				Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
				Exp. Route Total								5.3E-08					0.0002
			Exposure Point Total									2.9E-07					0.004
			Exposure Medium Total									2.9E-07					0.004
			Medium Total									2.9E-07					0.004
			Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	3.7E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	5.6E-08	1.4E-07	(mg/kg/day)	3.0E-04
Iron	2905	mg/kg					9.3E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.4E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0005	
Vanadium	7.48	mg/kg					2.4E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	8.8E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0009	
Exp. Route Total												5.6E-08					0.002
Dermal	Arsenic	1.17				mg/kg	4.5E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	6.7E-09	1.6E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00005	
	Iron	2905				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
	Vanadium	7.48				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
	Exp. Route Total											6.7E-09					0.00005
Exposure Point Total												6.3E-08					0.002
Exposure Medium Total												6.3E-08					0.002
Medium Total									6.3E-08					0.002			
Surface Water	Surface Water	Site 3	Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	6.1E-08	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	8.5E-10	2.2E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00001	
				Iron	3680	ug/L	1.2E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.3E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00006	
				Manganese	98.2	ug/L	3.1E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.2E-06	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.00005	
				Exp. Route Total								8.5E-10					0.0001
			Dermal	Bis(2-ethylhexyl)phthalate	19.0	ug/L	7.8E-06	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	1.1E-07	2.9E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.001	
				Iron	3680	ug/L	6.7E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.5E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00004	
				Manganese	98.2	ug/L	1.8E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.6E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0007	
				Exp. Route Total								1.1E-07					0.002
			Exposure Point Total									1.1E-07					0.002
			Exposure Medium Total									1.1E-07					0.002
Medium Total									1.1E-07					0.002			
Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	3.4E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.3E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.001	
				Arsenic	7.83	mg/kg	2.5E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.7E-07	9.2E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.003	
				Iron	7435	mg/kg	2.4E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	8.7E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.001	
				Vanadium	17.1	mg/kg	5.4E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.0E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.002	
				Exp. Route Total								3.7E-07					0.008
			Dermal	Aluminum	10752	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--	
				Arsenic	7.83	mg/kg	3.0E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	4.5E-08	1.1E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0004	
				Iron	7435	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
				Vanadium	17.1	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
			Exp. Route Total								4.5E-08					0.0004	
Exposure Point Total									4.2E-07					0.008			
Exposure Medium Total									4.2E-07					0.008			
Medium Total									4.2E-07					0.008			
Total of Receptor Risks Across All Media										8.8E-07	Total of Receptor Hazards Across All Media				0.02		

TABLE 7.6.RME
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
 PAGE 1 OF 3

Scenario Timeframe: Future
 Receptor Population: Resident
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units				
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	1.5E-06	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	1.1E-05	3.4E-06	(mg/kg/day)	NA	(mg/kg/day)	--	
				Arsenic	3.66	mg/kg	4.0E-06	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	6.0E-06	4.7E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.2	
				Iron	7331	mg/kg	8.0E-03	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	9.4E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.1	
			Vanadium	12.0	mg/kg	1.3E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.5E-04	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.2		
			Exp. Route Total								1.7E-05					0.4	
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	5.6E-07	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	4.1E-06	1.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--	
		Arsenic	3.66	mg/kg	3.4E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	5.1E-07	3.9E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.01			
		Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--			
		Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--			
		Exp. Route Total								4.6E-06					0.01		
		Exposure Point Total									2.2E-05					0.5	
		Exposure Medium Total									2.2E-05					0.5	
Medium Total									2.2E-05					0.5			
Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	4.3E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	6.4E-07	1.5E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.05	
				Iron	2905	mg/kg	1.1E-03	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.7E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.05	
				Vanadium	7.48	mg/kg	2.7E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	9.6E-05	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.10	
		Exp. Route Total								6.4E-07					0.2		
		Dermal	Arsenic	1.17	mg/kg	3.6E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	5.4E-08	4.2E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001		
		Iron	2905	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--			
Vanadium	7.48	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--					
Exp. Route Total								5.4E-08					0.001				
Exposure Point Total									6.9E-07					0.2			
Exposure Medium Total									6.9E-07					0.2			
Medium Total									6.9E-07					0.2			
Groundwater	Groundwater	Site 3	Ingestion	1,2,4-Trichlorobenzene	2.23	ug/L	1.8E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.1E-04	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.02	
				1,2-Dichloroethane	2.06	ug/L	1.7E-05	(mg/kg/day)	9.1E-02	(mg/kg/day) ⁻¹	1.5E-06	2.0E-04	(mg/kg/day)	NA	(mg/kg/day)	--	
				Benzene	2.22	ug/L	1.8E-05	(mg/kg/day)	5.5E-02	(mg/kg/day) ⁻¹	1.0E-06	2.1E-04	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.05	
				cis-1,2-Dichloroethene	132	ug/L	1.1E-03	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.3E-02	(mg/kg/day)	1.0E-02	(mg/kg/day)	1.3	
				Methylene Chloride	2.58	ug/L	2.1E-05	(mg/kg/day)	7.5E-03	(mg/kg/day) ⁻¹	1.6E-07	2.5E-04	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.004	
				trans-1,2-Dichloroethene	11.6	ug/L	9.5E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.1E-03	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.06	
				Trichloroethene	12.8	ug/L	1.1E-04	(mg/kg/day)	1.3E-02	(mg/kg/day) ⁻¹	1.4E-06	1.2E-03	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.002	
				Vinyl Chloride	17.1	ug/L	1.4E-04	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.1E-04	1.6E-03	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.5	
				Aluminum	799	ug/L	6.6E-03	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	7.7E-02	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.08	
				Arsenic	11.5	ug/L	9.5E-05	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.4E-04	1.1E-03	(mg/kg/day)	3.0E-04	(mg/kg/day)	3.7	
				Chromium	3.24	ug/L	2.7E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.1E-04	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.1	
				Iron	15878	ug/L	1.3E-01	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.5E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	2.2	
				Lead	1.51	ug/L	1.2E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.4E-04	(mg/kg/day)	NA	(mg/kg/day)	--	
				Manganese	137	ug/L	1.1E-03	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.3E-02	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.5	
				Vanadium	5.33	ug/L	4.4E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.1E-04	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.5	
				Exp. Route Total								3.6E-04					9.0

TABLE 7.6.RME
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
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Scenario Timeframe: Future
 Receptor Population: Resident
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient				
							Value	Units	Value	Units		Value	Units	Value	Units					
Groundwater	Groundwater	Site 3	Dermal	1,2,4-Trichlorobenzene	2.23	ug/L	8.9E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.0E-04	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.01				
				1,2-Dichloroethane	2.06	ug/L	3.1E-07	(mg/kg/day)	9.1E-02	(mg/kg/day) ⁻¹	2.8E-08	3.6E-06	(mg/kg/day)	NA	(mg/kg/day)	--				
				Benzene	2.22	ug/L	1.0E-06	(mg/kg/day)	5.5E-02	(mg/kg/day) ⁻¹	5.6E-08	1.2E-05	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.003				
				cis-1,2-Dichloroethene	132	ug/L	5.0E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.8E-04	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.06				
				Methylene Chloride	2.58	ug/L	3.0E-07	(mg/kg/day)	7.5E-03	(mg/kg/day) ⁻¹	2.2E-09	3.5E-06	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.00006				
				trans-1,2-Dichloroethene	11.6	ug/L	3.1E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.7E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.002				
				Trichloroethene	12.8	ug/L	6.5E-06	(mg/kg/day)	1.3E-02	(mg/kg/day) ⁻¹	8.5E-08	7.6E-05	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.0002				
				Vinyl Chloride	17.1	ug/L	2.7E-06	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	4.0E-06	3.1E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.01				
				Aluminum	799	ug/L	9.5E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.1E-04	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.0001				
				Arsenic	11.5	ug/L	1.4E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.1E-07	1.6E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.005				
				Chromium	3.24	ug/L	7.7E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	9.0E-07	(mg/kg/day)	7.5E-05	(mg/kg/day)	0.01				
				Iron	15878	ug/L	1.9E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.2E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.003				
				Lead	1.51	ug/L	1.8E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--				
				Manganese	137	ug/L	1.6E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.9E-05	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.02				
				Vanadium	5.33	ug/L	6.4E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	7.4E-07	(mg/kg/day)	2.6E-05	(mg/kg/day)	0.03				
							Exp. Route Total							4.4E-06				0.2		
						Exposure Point Total								3.6E-04				9.2		
					Exposure Medium Total									3.6E-04				9.2		
				Air	Air	Site 3	Inhalation	1,2,4-Trichlorobenzene	2.23	ug/L	1.8E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.1E-04	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.02
								1,2-Dichloroethane	2.06	ug/L	1.7E-05	(mg/kg/day)	9.1E-02	(mg/kg/day) ⁻¹	1.5E-06	2.0E-04	(mg/kg/day)	NA	(mg/kg/day)	--
Benzene	2.22	ug/L	1.8E-05					(mg/kg/day)	5.5E-02	(mg/kg/day) ⁻¹	1.0E-06	2.1E-04	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.05				
cis-1,2-Dichloroethene	132	ug/L	1.1E-03					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.3E-02	(mg/kg/day)	1.0E-02	(mg/kg/day)	1.3				
Methylene Chloride	2.58	ug/L	2.1E-05					(mg/kg/day)	7.5E-03	(mg/kg/day) ⁻¹	1.6E-07	2.5E-04	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.004				
trans-1,2-Dichloroethene	11.6	ug/L	9.5E-05					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.1E-03	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.06				
Trichloroethene	12.8	ug/L	1.1E-04					(mg/kg/day)	1.3E-02	(mg/kg/day) ⁻¹	1.4E-06	1.2E-03	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.002				
Vinyl Chloride	17.1	ug/L	1.4E-04					(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.1E-04	1.6E-03	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.5				
Aluminum	799	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--				
Arsenic	11.5	ug/L	0.0E+00					(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--				
Chromium	3.24	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	3.0E-03	(mg/kg/day)	--				
Iron	15878	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--				
Lead	1.51	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--				
Manganese	137	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.4E-02	(mg/kg/day)	--				
Vanadium	5.33	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E-03	(mg/kg/day)	--				
			Exp. Route Total											2.1E-04				1.9		
		Exposure Point Total												2.1E-04				1.9		
	Exposure Medium Total													2.1E-04				1.9		
Medium Total														5.8E-04				11		

TABLE 7.6.RME
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
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Scenario Timeframe: Future
 Receptor Population: Resident
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Surface Water	Surface Water	Site 3	Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	4.5E-07	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	6.2E-09	5.2E-06	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0003	
				Iron	3680	ug/L	8.6E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.0E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.001	
				Manganese	98.2	ug/L	2.3E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.7E-05	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.001	
			Exp. Route Total								6.2E-09					0.003	
			Dermal	Bis(2-ethylhexyl)phthalate	19.0	ug/L	5.6E-06	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	7.9E-08	6.6E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.003	
				Iron	3680	ug/L	4.8E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.6E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00008	
				Manganese	98.2	ug/L	1.3E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.5E-06	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.002	
			Exp. Route Total								7.9E-08					0.005	
			Exposure Point Total								8.5E-08						0.008
			Exposure Medium Total								8.5E-08						0.008
Medium Total								8.5E-08						0.008			
Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	1.0E-03	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.2E-02	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.01	
				Arsenic	7.83	mg/kg	7.4E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.1E-06	8.6E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.03	
				Iron	7435	mg/kg	7.0E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	8.1E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.01	
				Vanadium	17.1	mg/kg	1.6E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.9E-05	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.02	
			Exp. Route Total								1.1E-06					0.07	
			Dermal	Aluminum	10752	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--	
				Arsenic	7.83	mg/kg	6.2E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	9.3E-08	7.2E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002	
				Iron	7435	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
				Vanadium	17.1	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
			Exp. Route Total								9.3E-08					0.002	
Exposure Point Total								1.2E-06						0.07			
Exposure Medium Total								1.2E-06						0.07			
Medium Total								1.2E-06						0.07			
Total of Receptor Risks Across All Media										6.0E-04	Total of Receptor Hazards Across All Media				12		

Note:
 Inhalation exposures are assumed to be equal to the exposures from ingestion of groundwater.

TABLE 7.7.RME
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
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Scenario Timeframe: Future
 Receptor Population: Resident
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient		
							Value	Units	Value	Units		Value	Units					
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	2.3E-07	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	1.7E-06	3.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--		
				Arsenic	3.66	mg/kg	1.7E-06	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.6E-06	5.0E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.02		
				Iron	7331	mg/kg	3.4E-03	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.0E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.01		
				Vanadium	12.0	mg/kg	5.6E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.6E-05	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.02		
			Exp. Route Total								4.2E-06					0.05		
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	1.2E-07	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	8.6E-07	1.9E-07	(mg/kg/day)	NA	(mg/kg/day)	--		
				Arsenic	3.66	mg/kg	2.1E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.1E-07	6.0E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002		
				Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--		
				Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--		
			Exp. Route Total								1.2E-06					0.002		
Exposure Point Total									5.4E-06					0.05				
Exposure Medium Total									5.4E-06					0.05				
Medium Total									5.4E-06					0.05				
Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	2.3E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.4E-07	1.6E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.005		
				Iron	2905	mg/kg	5.7E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.0E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.006		
				Vanadium	7.48	mg/kg	1.5E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.0E-05	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.01		
			Exp. Route Total								3.4E-07					0.02		
			Dermal	Arsenic	1.17	mg/kg	2.7E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	4.1E-08	8.0E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0003		
				Iron	2905	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--		
				Vanadium	7.48	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--		
			Exp. Route Total								4.1E-08					0.0003		
			Exposure Point Total									3.8E-07					0.02	
			Exposure Medium Total									3.8E-07					0.02	
Medium Total									3.8E-07					0.02				
Groundwater	Groundwater	Site 3	Ingestion	1,2,4-Trichlorobenzene	2.23	ug/L	2.1E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.1E-05	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.006		
				1,2-Dichloroethane	2.06	ug/L	1.9E-05	(mg/kg/day)	9.1E-02	(mg/kg/day) ⁻¹	1.8E-06	5.6E-05	(mg/kg/day)	NA	(mg/kg/day)	--		
				Benzene	2.22	ug/L	2.1E-05	(mg/kg/day)	5.5E-02	(mg/kg/day) ⁻¹	1.1E-06	6.1E-05	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.02		
				cis-1,2-Dichloroethene	132	ug/L	1.2E-03	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.6E-03	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.4		
				Methylene Chloride	2.58	ug/L	2.4E-05	(mg/kg/day)	7.5E-03	(mg/kg/day) ⁻¹	1.8E-07	7.1E-05	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.001		
				trans-1,2-Dichloroethene	11.6	ug/L	1.1E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.2E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.02		
				Trichloroethene	12.8	ug/L	1.2E-04	(mg/kg/day)	1.3E-02	(mg/kg/day) ⁻¹	1.6E-06	3.5E-04	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.0007		
				Vinyl Chloride	17.1	ug/L	1.6E-04	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.4E-04	4.7E-04	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.2		
				Aluminum	799	ug/L	7.5E-03	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.2E-02	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.02		
				Arsenic	11.5	ug/L	1.1E-04	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.6E-04	3.2E-04	(mg/kg/day)	3.0E-04	(mg/kg/day)	1.1		
				Chromium	3.24	ug/L	3.0E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	8.9E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.03		
				Iron	15878	ug/L	1.5E-01	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.4E-01	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.6		
				Lead	1.51	ug/L	1.4E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.1E-05	(mg/kg/day)	NA	(mg/kg/day)	--		
				Manganese	137	ug/L	1.3E-03	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.8E-03	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.2		
				Vanadium	5.33	ug/L	5.0E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.5E-04	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.1		
				Exp. Route Total									4.1E-04					2.6

TABLE 7.7.RME
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
 PAGE 2 OF 3

Scenario Timeframe: Future
 Receptor Population: Resident
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations							
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units	Value	Units				
Groundwater	Groundwater	Site 3	Dermal	1,2,4-Trichlorobenzene	2.23	ug/L	2.1E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.1E-05	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.006			
				1,2-Dichloroethane	2.06	ug/L	7.2E-07	(mg/kg/day)	9.1E-02	(mg/kg/day) ⁻¹	6.5E-08	2.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--			
				Benzene	2.22	ug/L	2.4E-06	(mg/kg/day)	5.5E-02	(mg/kg/day) ⁻¹	1.3E-07	7.0E-06	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.002			
				cis-1,2-Dichloroethene	132	ug/L	1.2E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.4E-04	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.03			
				Methylene Chloride	2.58	ug/L	6.9E-07	(mg/kg/day)	7.5E-03	(mg/kg/day) ⁻¹	5.2E-09	2.0E-06	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.00003			
				trans-1,2-Dichloroethene	11.6	ug/L	7.3E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.1E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.001			
				Trichloroethene	12.8	ug/L	1.5E-05	(mg/kg/day)	1.3E-02	(mg/kg/day) ⁻¹	2.0E-07	4.4E-05	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.00009			
				Vinyl Chloride	17.1	ug/L	6.3E-06	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	9.4E-06	1.8E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.006			
				Aluminum	799	ug/L	2.2E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.5E-05	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00007			
				Arsenic	11.5	ug/L	3.2E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	4.8E-07	9.4E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.003			
				Chromium	3.24	ug/L	1.8E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.3E-07	(mg/kg/day)	7.5E-05	(mg/kg/day)	0.007			
				Iron	15878	ug/L	4.4E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.3E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.002			
				Lead	1.51	ug/L	4.2E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--			
				Manganese	137	ug/L	3.8E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.1E-05	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.01			
				Vanadium	5.33	ug/L	1.5E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.3E-07	(mg/kg/day)	2.6E-05	(mg/kg/day)	0.02			
							Exp. Route Total							1.0E-05					0.09
						Exposure Point Total								4.2E-04					2.7
					Exposure Medium Total									4.2E-04					2.7
				Air	Air	Site 3	Inhalation	1,2,4-Trichlorobenzene	2.23	ug/L	2.1E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.1E-05	(mg/kg/day)	1.0E-02	(mg/kg/day)
		1,2-Dichloroethane	2.06					ug/L	1.9E-05	(mg/kg/day)	9.1E-02	(mg/kg/day) ⁻¹	1.8E-06	5.6E-05	(mg/kg/day)	NA	(mg/kg/day)	--	
Benzene	2.22	ug/L	2.1E-05					(mg/kg/day)	5.5E-02	(mg/kg/day) ⁻¹	1.1E-06	6.1E-05	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.02			
cis-1,2-Dichloroethene	132	ug/L	1.2E-03					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.6E-03	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.4			
Methylene Chloride	2.58	ug/L	2.4E-05					(mg/kg/day)	7.5E-03	(mg/kg/day) ⁻¹	1.8E-07	7.1E-05	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.001			
trans-1,2-Dichloroethene	11.6	ug/L	1.1E-04					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.2E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.02			
Trichloroethene	12.8	ug/L	1.2E-04					(mg/kg/day)	1.3E-02	(mg/kg/day) ⁻¹	1.6E-06	3.5E-04	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.0007			
Vinyl Chloride	17.1	ug/L	1.6E-04					(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.4E-04	4.7E-04	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.2			
Aluminum	799	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--			
Arsenic	11.5	ug/L	0.0E+00					(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--			
Chromium	3.24	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	3.0E-03	(mg/kg/day)	--			
Iron	15878	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--			
Lead	1.51	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--			
Manganese	137	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.4E-02	(mg/kg/day)	--			
Vanadium	5.33	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E-03	(mg/kg/day)	--			
			Exp. Route Total											2.5E-04					0.6
		Exposure Point Total												2.5E-04					0.6
	Exposure Medium Total													2.5E-04					0.6
Medium Total														6.6E-04					3.2

TABLE 7.7.RME
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 REASONABLE MAXIMUM EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
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Scenario Timeframe: Future
 Receptor Population: Resident
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units				
Surface Water	Surface Water	Site 3	Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	7.6E-08	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	1.1E-09	2.2E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0001	
				Iron	3680	ug/L	1.5E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.3E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00006	
				Manganese	98.2	ug/L	4.0E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.2E-06	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.00005	
			Exp. Route Total								1.1E-09					0.0001	
			Dermal	Bis(2-ethylhexyl)phthalate	19.0	ug/L	9.8E-06	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	1.4E-07	2.9E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.001	
				Iron	3680	ug/L	8.4E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.5E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00004	
				Manganese	98.2	ug/L	2.3E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.6E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0007	
			Exp. Route Total								1.4E-07					0.002	
			Exposure Point Total								1.4E-07						0.002
			Exposure Medium Total								1.4E-07						0.002
Medium Total								1.4E-07						0.002			
Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	4.3E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.3E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.001	
				Arsenic	7.83	mg/kg	3.2E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	4.7E-07	9.2E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.003	
				Iron	7435	mg/kg	3.0E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	8.7E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.001	
				Vanadium	17.1	mg/kg	6.9E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.0E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.002	
			Exp. Route Total								4.7E-07					0.008	
			Dermal	Aluminum	10752	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--	
				Arsenic	7.83	mg/kg	3.8E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	5.7E-08	1.1E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0004	
				Iron	7435	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
				Vanadium	17.1	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
			Exp. Route Total								5.7E-08					0.0004	
Exposure Point Total								5.3E-07						0.008			
Exposure Medium Total								5.3E-07						0.008			
Medium Total								5.3E-07						0.008			
Total of Receptor Risks Across All Media										6.7E-04	Total of Receptor Hazards Across All Media				3.3		

Note:
 Inhalation exposures are assumed to be equal to the exposures from ingestion of groundwater.

TABLE 7.1.CTE
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
 PAGE 1 OF 2

Scenario Timeframe: Future
 Receptor Population: Construction Workers
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units			
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	3.1E-09	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	2.2E-08	2.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--		
				Arsenic	3.66	mg/kg	4.2E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	6.3E-08	3.0E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.010		
				Iron	7331	mg/kg	8.5E-05	(mg/kg/day)	NA	(mg/kg/day)-1	--	5.9E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.008		
				Vanadium	12.0	mg/kg	1.4E-07	(mg/kg/day)	NA	(mg/kg/day)-1	--	9.7E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.010		
				Exp. Route Total							8.6E-08						0.03	
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	7.9E-10	(mg/kg/day)	7.3E+00	(mg/kg/day)-1	5.8E-09	5.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--		
				Arsenic	3.66	mg/kg	2.5E-09	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	3.8E-09	1.8E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0006		
				Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--		
				Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--		
				Exp. Route Total							9.6E-09						0.0006	
				Exposure Point Total							9.5E-08						0.03	
				Exposure Medium Total							9.5E-08						0.03	
				Medium Total							9.5E-08						0.03	
			Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	1.3E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	2.0E-08	9.4E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)
Iron	2905	mg/kg					3.4E-05	(mg/kg/day)	NA	(mg/kg/day)-1	--	2.3E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.003		
Vanadium	7.48	mg/kg					8.6E-08	(mg/kg/day)	NA	(mg/kg/day)-1	--	6.0E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.006		
	Exp. Route Total										2.0E-08						0.01	
Dermal	Arsenic	1.17				mg/kg	8.1E-10	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	1.2E-09	5.7E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002		
	Iron	2905				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--		
	Vanadium	7.48				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--		
	Exp. Route Total										1.2E-09						0.0002	
	Exposure Point Total										2.1E-08						0.01	
	Exposure Medium Total										2.1E-08						0.01	
	Medium Total							2.1E-08						0.01				
Groundwater	Groundwater	Site 3	Dermal	1,2,4-Trichlorobenzene	2.23	ug/L	1.7E-08	(mg/kg/day)	NA	(mg/kg/day)-1	--	1.2E-06	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.0001		
				1,2-Dichloroethane	2.06	ug/L	6.6E-10	(mg/kg/day)	9.1E-02	(mg/kg/day)-1	6.0E-11	4.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--		
				Benzene	2.22	ug/L	2.3E-09	(mg/kg/day)	5.5E-02	(mg/kg/day)-1	1.3E-10	1.6E-07	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.00004		
				cis-1,2-Dichloroethene	132	ug/L	1.1E-07	(mg/kg/day)	NA	(mg/kg/day)-1	--	7.5E-06	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.0007		
				Methylene Chloride	2.58	ug/L	6.6E-10	(mg/kg/day)	7.5E-03	(mg/kg/day)-1	5.0E-12	4.6E-08	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.0000008		
				trans-1,2-Dichloroethene	11.6	ug/L	6.7E-09	(mg/kg/day)	NA	(mg/kg/day)-1	--	4.7E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00002		
				Trichloroethene	12.8	ug/L	1.3E-08	(mg/kg/day)	1.3E-02	(mg/kg/day)-1	1.7E-10	9.0E-07	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.000002		
				Vinyl Chloride	17.1	ug/L	6.5E-09	(mg/kg/day)	7.2E-01	(mg/kg/day)-1	4.7E-09	4.5E-07	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.0002		
				Aluminum	799	ug/L	4.4E-08	(mg/kg/day)	NA	(mg/kg/day)-1	--	3.1E-06	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.000003		
				Arsenic	11.5	ug/L	6.4E-10	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	9.5E-10	4.5E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0001		
				Chromium	3.24	ug/L	3.6E-10	(mg/kg/day)	NA	(mg/kg/day)-1	--	2.5E-08	(mg/kg/day)	7.5E-05	(mg/kg/day)	0.0003		
				Iron	15878	ug/L	8.8E-07	(mg/kg/day)	NA	(mg/kg/day)-1	--	6.2E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00009		
				Lead	1.51	ug/L	8.4E-11	(mg/kg/day)	NA	(mg/kg/day)-1	--	5.9E-09	(mg/kg/day)	NA	(mg/kg/day)	--		
				Manganese	137	ug/L	7.6E-09	(mg/kg/day)	NA	(mg/kg/day)-1	--	5.3E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0006		
				Vanadium	5.33	ug/L	3.0E-10	(mg/kg/day)	NA	(mg/kg/day)-1	--	2.1E-08	(mg/kg/day)	2.6E-05	(mg/kg/day)	0.0008		
					Exp. Route Total							6.0E-09						0.003
					Exposure Point Total							6.0E-09						0.003
					Exposure Medium Total							6.0E-09						0.003

TABLE 7.1.CTE
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
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Scenario Timeframe: Future
 Receptor Population: Construction Workers
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Groundwater	Air	Site 3	Inhalation	1,2,4-Trichlorobenzene	5.9E-5	mg/m3	2.5E-09	(mg/kg/day)	NA	(mg/kg/day)-1	--	1.7E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				1,2-Dichloroethane	7.2E-5	mg/m3	3.0E-09	(mg/kg/day)	9.1E-02	(mg/kg/day)-1	2.8E-10	2.1E-07	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0000003
				Benzene	9.2E-5	mg/m3	3.9E-09	(mg/kg/day)	2.7E-02	(mg/kg/day)-1	1.0E-10	2.7E-07	(mg/kg/day)	8.6E-03	(mg/kg/day)	0.00003
				cis-1,2-Dichloroethene	0.005	mg/m3	2.1E-07	(mg/kg/day)	NA	(mg/kg/day)-1	--	1.4E-05	(mg/kg/day)	NA	(mg/kg/day)	--
				Methylene Chloride	1.0E-4	mg/m3	4.2E-09	(mg/kg/day)	1.6E-03	(mg/kg/day)-1	6.8E-12	3.0E-07	(mg/kg/day)	3.0E-01	(mg/kg/day)	0.0000010
				trans-1,2-Dichloroethene	4.3E-4	mg/m3	1.8E-08	(mg/kg/day)	NA	(mg/kg/day)-1	--	1.3E-06	(mg/kg/day)	1.7E-02	(mg/kg/day)	0.00008
				Trichloroethene	4.1E-4	mg/m3	1.7E-08	(mg/kg/day)	7.0E-03	(mg/kg/day)-1	1.2E-10	1.2E-06	(mg/kg/day)	1.7E-01	(mg/kg/day)	0.000007
				Vinyl Chloride	8.0E-4	mg/m3	3.4E-08	(mg/kg/day)	1.5E-02	(mg/kg/day)-1	5.0E-10	2.4E-06	(mg/kg/day)	2.9E-02	(mg/kg/day)	0.00008
				Aluminum	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	1.4E-03	(mg/kg/day)	--
				Arsenic	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	1.5E+01	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Chromium	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	4.2E+01	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	2.9E-05	(mg/kg/day)	--
				Iron	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Lead	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
				Manganese	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	1.4E-05	(mg/kg/day)	--
				Vanadium	0.0E+0	mg/m3	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--
Exp. Route Total										1.0E-09				0.0002		
Exposure Point Total										1.0E-09				0.0002		
Exposure Medium Total										1.0E-09				0.003		
Medium Total										7.0E-09				0.006		
Surface Water	Surface Water	Site 3	Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	1.6E-09	(mg/kg/day)	1.4E-02	(mg/kg/day)-1	2.2E-11	1.1E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000006
				Iron	3680	ug/L	3.1E-07	(mg/kg/day)	NA	(mg/kg/day)-1	--	2.2E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00003
				Manganese	98.2	ug/L	8.2E-09	(mg/kg/day)	NA	(mg/kg/day)-1	--	5.8E-07	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.00002
				Exp. Route Total									2.2E-11			
			Dermal	Bis(2-ethylhexyl)phthalate	19.0	ug/L	1.2E-07	(mg/kg/day)	1.4E-02	(mg/kg/day)-1	1.7E-09	8.3E-06	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0004
				Iron	3680	ug/L	1.0E-07	(mg/kg/day)	NA	(mg/kg/day)-1	--	7.1E-06	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00001
				Manganese	98.2	ug/L	2.7E-09	(mg/kg/day)	NA	(mg/kg/day)-1	--	1.9E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0002
			Exp. Route Total									1.7E-09				0.0006
			Exposure Point Total									1.7E-09				0.0007
			Exposure Medium Total									1.7E-09				0.0007
Medium Total									1.7E-09				0.0007			
Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	1.5E-05	(mg/kg/day)	NA	(mg/kg/day)-1	--	1.0E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.001
				Arsenic	7.83	mg/kg	1.1E-08	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	1.6E-08	7.6E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.003
				Iron	7435	mg/kg	1.0E-05	(mg/kg/day)	NA	(mg/kg/day)-1	--	7.2E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.001
				Vanadium	17.1	mg/kg	2.4E-08	(mg/kg/day)	NA	(mg/kg/day)-1	--	1.7E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.002
			Exp. Route Total									1.6E-08				0.006
			Dermal	Aluminum	10752	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--
				Arsenic	7.83	mg/kg	6.5E-10	(mg/kg/day)	1.5E+00	(mg/kg/day)-1	9.7E-10	4.5E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002
				Iron	7435	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Vanadium	17.1	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)-1	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--
			Exp. Route Total									9.7E-10				0.0002
Exposure Point Total									1.7E-08				0.006			
Exposure Medium Total									1.7E-08				0.006			
Medium Total									1.7E-08				0.006			
Total of Receptor Risks Across All Media										1.4E-07	Total of Receptor Hazards Across All Media				0.05	

TABLE 7.2.CTE
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
 Receptor Population: Maintenance Workers
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	8.0E-10	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	5.8E-09	6.2E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	3.66	mg/kg	1.1E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.7E-08	8.6E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0003
				Iron	7331	mg/kg	2.2E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.7E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0002
				Vanadium	12.0	mg/kg	3.6E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.8E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0003
				Exp. Route Total								2.2E-08				0.0008
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	1.4E-10	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	1.0E-09	1.1E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	3.66	mg/kg	4.4E-10	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	6.6E-10	3.4E-09	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00001
				Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--
				Exp. Route Total								1.7E-09				0.00001
			Exposure Point Total									2.4E-08				0.0008
			Exposure Medium Total									2.4E-08				0.0008
			Medium Total									2.4E-08				0.0008
			Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	3.5E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	5.3E-09	2.7E-08	(mg/kg/day)
Iron	2905	mg/kg					8.8E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.8E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00010
Vanadium	7.48	mg/kg					2.3E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.8E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0002
Exp. Route Total												5.3E-09				0.0004
Dermal	Arsenic	1.17				mg/kg	1.4E-10	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.1E-10	1.1E-09	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.000004
	Iron	2905				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
	Vanadium	7.48				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--
Exp. Route Total											2.1E-10				0.000004	
Exposure Point Total												5.5E-09				0.0004
Exposure Medium Total												5.5E-09				0.0004
Medium Total									5.5E-09				0.0004			
Surface Water	Surface Water	Site 3	Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	1.1E-08	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	1.6E-10	8.9E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000004
				Iron	3680	ug/L	2.2E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.7E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00002
				Manganese	98.2	ug/L	5.9E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.6E-07	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.00002
			Exp. Route Total								1.6E-10				0.00005	
			Dermal	Bis(2-ethylhexyl)phthalate	19.0	ug/L	8.5E-07	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	1.2E-08	6.6E-06	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0003
				Iron	3680	ug/L	7.3E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.7E-06	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.000008
				Manganese	98.2	ug/L	2.0E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.5E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0002
			Exp. Route Total								1.2E-08				0.0005	
			Exposure Point Total									1.2E-08				0.0005
			Exposure Medium Total									1.2E-08				0.0005
Medium Total									1.2E-08				0.0005			
Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	3.2E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.5E-04	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.0003
				Arsenic	7.83	mg/kg	2.4E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.5E-08	1.8E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0006
				Iron	7435	mg/kg	2.2E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.7E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0002
				Vanadium	17.1	mg/kg	5.2E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.0E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0004
			Exp. Route Total								3.5E-08				0.002	
			Dermal	Aluminum	10752	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--
				Arsenic	7.83	mg/kg	9.4E-10	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.4E-09	7.3E-09	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00002
				Iron	7435	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Vanadium	17.1	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--
			Exp. Route Total								1.4E-09				0.00002	
Exposure Point Total									3.7E-08				0.002			
Exposure Medium Total									3.7E-08				0.002			
Medium Total									3.7E-08				0.002			
Total of Receptor Risks Across All Media										7.9E-08	Total of Receptor Hazards Across All Media				0.003	

TABLE 7.3.CTE
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
 Receptor Population: Industrial Workers
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	1.5E-08	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	1.1E-07	1.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	3.66	mg/kg	2.0E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.0E-07	1.6E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.005
				Iron	7331	mg/kg	4.0E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.1E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.004
				Vanadium	12.0	mg/kg	6.6E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.1E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.005
				Exp. Route Total								4.1E-07				0.01
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	2.5E-09	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	1.8E-08	1.9E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	3.66	mg/kg	8.0E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.2E-08	6.2E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002
				Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--
				Exp. Route Total								3.0E-08				0.0002
			Exposure Point Total								4.4E-07				0.02	
			Exposure Medium Total								4.4E-07				0.02	
			Medium Total								4.4E-07				0.02	
			Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	6.4E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	9.7E-08	5.0E-07	(mg/kg/day)
Iron	2905	mg/kg					1.6E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.2E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.002
Vanadium	7.48	mg/kg					4.1E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.2E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.003
Exp. Route Total												9.7E-08				0.007
Dermal	Arsenic	1.17				mg/kg	2.6E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.8E-09	2.0E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00007
	Iron	2905				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
	Vanadium	7.48				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--
	Exp. Route Total											3.8E-09				0.00007
Exposure Point Total											1.0E-07				0.007	
Exposure Medium Total											1.0E-07				0.007	
Medium Total								1.0E-07				0.007				
Surface Water	Surface Water	Site 3	Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	1.1E-08	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	1.6E-10	8.9E-08	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000004
				Iron	3680	ug/L	2.2E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.7E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00002
				Manganese	98.2	ug/L	5.9E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.6E-07	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.00002
				Exp. Route Total								1.6E-10				0.00005
			Dermal	Bis(2-ethylhexyl)phthalate	19.0	ug/L	8.5E-07	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	1.2E-08	6.6E-06	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0003
				Iron	3680	ug/L	7.3E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.7E-06	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.000008
				Manganese	98.2	ug/L	2.0E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.5E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0002
				Exp. Route Total								1.2E-08				0.0005
			Exposure Point Total								1.2E-08				0.0005	
			Exposure Medium Total								1.2E-08				0.0005	
Medium Total								1.2E-08				0.0005				
Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	1.6E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.3E-04	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.0001
				Arsenic	7.83	mg/kg	1.2E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.8E-08	9.2E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0003
				Iron	7435	mg/kg	1.1E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	8.7E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0001
				Vanadium	17.1	mg/kg	2.6E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.0E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0002
				Exp. Route Total								1.8E-08				0.0008
			Dermal	Aluminum	10752	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--
				Arsenic	7.83	mg/kg	9.4E-10	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.4E-09	7.3E-09	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00002
				Iron	7435	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Vanadium	17.1	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--
				Exp. Route Total								1.4E-09				0.00002
Exposure Point Total								1.9E-08				0.0008				
Exposure Medium Total								1.9E-08				0.0008				
Medium Total								1.9E-08				0.0008				
Total of Receptor Risks Across All Media										5.7E-07	Total of Receptor Hazards Across All Media				0.02	

TABLE 7.4.CTE
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
 Receptor Population: Trespassers
 Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient			
							Value	Units	Value	Units		Value	Units						
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	5.7E-09	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	4.2E-08	3.6E-08	(mg/kg/day)	NA	(mg/kg/day)	--			
				Arsenic	3.66	mg/kg	2.6E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.9E-08	1.7E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0006			
				Iron	7331	mg/kg	5.3E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.3E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0005			
				Vanadium	12.0	mg/kg	8.6E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.5E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0005			
				Exp. Route Total								8.1E-08					0.002		
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	6.4E-10	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	4.7E-09	4.1E-09	(mg/kg/day)	NA	(mg/kg/day)	--			
				Arsenic	3.66	mg/kg	2.0E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.1E-09	1.3E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00004			
				Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--			
				Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--			
				Exp. Route Total								7.8E-09					0.00004		
				Exposure Point Total								8.9E-08					0.002		
				Exposure Medium Total								8.9E-08					0.002		
			Medium Total										8.9E-08				0.002		
			Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	8.4E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.3E-08	5.3E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002
Iron	2905	mg/kg					2.1E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.3E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0002			
Vanadium	7.48	mg/kg					5.4E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.4E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0003			
	Exp. Route Total												1.3E-08				0.0007		
Dermal	Arsenic	1.17				mg/kg	6.5E-10	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	9.8E-10	4.2E-09	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00001			
	Iron	2905				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--			
	Vanadium	7.48				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--			
		Exp. Route Total											9.8E-10				0.00001		
	Exposure Point Total											1.4E-08					0.0007		
	Exposure Medium Total											1.4E-08					0.0007		
Medium Total										1.4E-08				0.0007					
Surface Water	Surface Water	Site 3				Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	1.4E-07	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	1.9E-09	8.7E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.00004
							Iron	3680	ug/L	2.6E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.7E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0002
							Manganese	98.2	ug/L	7.0E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.5E-06	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.0002
				Exp. Route Total									1.9E-09				0.0005		
			Dermal	Bis(2-ethylhexyl)phthalate	19.0	ug/L	1.9E-06	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	2.7E-08	1.2E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0006			
				Iron	3680	ug/L	1.6E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.0E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00001			
				Manganese	98.2	ug/L	4.4E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.8E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0003			
					Exp. Route Total								2.7E-08				0.0009		
				Exposure Point Total								2.9E-08					0.001		
				Exposure Medium Total								2.9E-08					0.001		
			Medium Total										2.9E-08				0.001		
			Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	7.7E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.9E-04	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.0005
							Arsenic	7.83	mg/kg	5.6E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	8.4E-08	3.6E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.001
							Iron	7435	mg/kg	5.3E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.4E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0005
Vanadium	17.1	mg/kg					1.2E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	7.8E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0008			
	Exp. Route Total											8.4E-08				0.003			
Dermal	Aluminum	10752				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--			
	Arsenic	7.83				mg/kg	4.4E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	6.6E-09	2.8E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00009			
	Iron	7435				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--			
	Vanadium	17.1				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--			
	Exp. Route Total											6.6E-09				0.00009			
	Exposure Point Total											9.1E-08					0.003		
	Exposure Medium Total											9.1E-08					0.003		
Medium Total										9.1E-08				0.003					
Total of Receptor Risks Across All Media										2.2E-07				Total of Receptor Hazards Across All Media	0.007				

TABLE 7.5.CTE
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
 Receptor Population: Trespassers
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units			
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	1.3E-09	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	9.8E-09	1.3E-08	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	3.66	mg/kg	1.9E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.8E-08	1.9E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0006
				Iron	7331	mg/kg	3.7E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.7E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0005
				Vanadium	12.0	mg/kg	6.1E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.1E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0006
				Exp. Route Total								3.8E-08				0.002
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	2.0E-10	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	1.5E-09	2.0E-09	(mg/kg/day)	NA	(mg/kg/day)	--
				Arsenic	3.66	mg/kg	6.4E-10	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	9.6E-10	6.4E-09	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00002
				Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--
				Exp. Route Total								2.4E-09				0.00002
			Exposure Point Total								4.0E-08				0.002	
			Exposure Medium Total								4.0E-08				0.002	
			Medium Total								4.0E-08				0.002	
			Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	6.0E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	8.9E-09	6.0E-08	(mg/kg/day)
Iron	2905	mg/kg					1.5E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.5E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0002
Vanadium	7.48	mg/kg					3.8E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.8E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0004
Exp. Route Total												8.9E-09				0.0008
Dermal	Arsenic	1.17				mg/kg	2.0E-10	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.1E-10	2.0E-09	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.000007
	Iron	2905				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
	Vanadium	7.48				mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--
	Exp. Route Total											3.1E-10				0.000007
Exposure Point Total											9.2E-09				0.0008	
Exposure Medium Total											9.2E-09				0.0008	
Medium Total								9.2E-09				0.0008				
Surface Water	Surface Water	Site 3	Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	3.0E-08	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	4.2E-10	1.1E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000006
				Iron	3680	ug/L	5.9E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.2E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00003
				Manganese	98.2	ug/L	1.6E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.8E-07	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.00002
				Exp. Route Total								4.2E-10				0.00006
			Dermal	Bis(2-ethylhexyl)phthalate	19.0	ug/L	3.9E-06	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	5.4E-08	1.4E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0007
				Iron	3680	ug/L	3.3E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.2E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00002
				Manganese	98.2	ug/L	8.9E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.3E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0003
				Exp. Route Total								5.4E-08				0.001
			Exposure Point Total								5.5E-08				0.001	
			Exposure Medium Total								5.5E-08				0.001	
Medium Total								5.5E-08				0.001				
Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	5.0E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.2E-04	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.0003
				Arsenic	7.83	mg/kg	3.6E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	5.4E-08	2.3E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0008
				Iron	7435	mg/kg	3.4E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.2E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0003
				Vanadium	17.1	mg/kg	7.9E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.0E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0005
				Exp. Route Total								5.4E-08				0.002
			Dermal	Aluminum	10752	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--
				Arsenic	7.83	mg/kg	4.9E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	7.4E-09	3.1E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0001
				Iron	7435	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--
				Vanadium	17.1	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--
				Exp. Route Total								7.4E-09				0.0001
			Exposure Point Total								6.2E-08				0.002	
			Exposure Medium Total								6.2E-08				0.002	
			Medium Total								6.2E-08				0.002	
			Total of Receptor Risks Across All Media										1.7E-07	Total of Receptor Hazards Across All Media		

TABLE 7.6.CTE
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
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Scenario Timeframe: Future
 Receptor Population: Resident
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units	Value	Units		
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	3.2E-08	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	2.4E-07	1.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--	
				Arsenic	3.66	mg/kg	4.5E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	6.7E-07	1.6E-05	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.05	
				Iron	7331	mg/kg	9.0E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.1E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.04	
				Vanadium	12.0	mg/kg	1.5E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.1E-05	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.05	
			Exp. Route Total							9.1E-07						0.1	
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	4.7E-09	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	3.4E-08	1.6E-07	(mg/kg/day)	NA	(mg/kg/day)	--	
		Arsenic	3.66	mg/kg	1.5E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.3E-08	5.3E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002			
		Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--			
		Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--			
		Exp. Route Total							5.7E-08						0.002		
		Exposure Point Total							9.6E-07							0.1	
		Exposure Medium Total							9.6E-07							0.1	
Medium Total							9.6E-07							0.1			
Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	1.4E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.1E-07	5.0E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.02	
				Iron	2905	mg/kg	3.5E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.2E-02	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.02	
				Vanadium	7.48	mg/kg	9.1E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.2E-05	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.03	
				Exp. Route Total						2.1E-07						0.07	
			Dermal	Arsenic	1.17	mg/kg	4.8E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	7.2E-09	1.7E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0006	
			Iron	2905	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--		
		Vanadium	7.48	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--			
		Exp. Route Total							7.2E-09						0.0006		
		Exposure Point Total							2.2E-07							0.07	
		Exposure Medium Total							2.2E-07							0.07	
		Medium Total							2.2E-07							0.07	
		Groundwater	Groundwater	Site 3	Ingestion	1,2,4-Trichlorobenzene	2.23	ug/L	1.8E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.3E-05	(mg/kg/day)	1.0E-02	(mg/kg/day)
1,2-Dichloroethane	2.06					ug/L	1.7E-06	(mg/kg/day)	9.1E-02	(mg/kg/day) ⁻¹	1.5E-07	5.8E-05	(mg/kg/day)	NA	(mg/kg/day)	--	
Benzene	2.22					ug/L	1.8E-06	(mg/kg/day)	5.5E-02	(mg/kg/day) ⁻¹	9.8E-08	6.3E-05	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.02	
cis-1,2-Dichloroethene	132					ug/L	1.1E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.7E-03	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.4	
Methylene Chloride	2.58					ug/L	2.1E-06	(mg/kg/day)	7.5E-03	(mg/kg/day) ⁻¹	1.6E-08	7.3E-05	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.001	
trans-1,2-Dichloroethene	11.6					ug/L	9.3E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.3E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.02	
Trichloroethene	12.8					ug/L	1.0E-05	(mg/kg/day)	1.3E-02	(mg/kg/day) ⁻¹	1.3E-07	3.6E-04	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.0007	
Vinyl Chloride	17.1					ug/L	1.4E-05	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.1E-05	4.8E-04	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.2	
Aluminum	799					ug/L	6.4E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.3E-02	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.02	
Arsenic	11.5					ug/L	9.3E-06	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.4E-05	3.2E-04	(mg/kg/day)	3.0E-04	(mg/kg/day)	1.1	
Chromium	3.24					ug/L	2.6E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	9.1E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.03	
Iron	15878					ug/L	1.3E-02	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.5E-01	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.6	
Lead	1.51					ug/L	1.2E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.3E-05	(mg/kg/day)	NA	(mg/kg/day)	--	
Manganese	137					ug/L	1.1E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.9E-03	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.2	
Vanadium	5.33					ug/L	4.3E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.5E-04	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.2	
Exp. Route Total											3.5E-05						2.7

TABLE 7.6.CTE
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
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Scenario Timeframe: Future
 Receptor Population: Resident
 Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient				
							Value	Units	Value	Units		Value	Units	Value	Units					
Groundwater	Groundwater	Site 3	Dermal	1,2,4-Trichlorobenzene	2.23	ug/L	1.7E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.1E-05	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.006				
				1,2-Dichloroethane	2.06	ug/L	6.0E-08	(mg/kg/day)	9.1E-02	(mg/kg/day) ⁻¹	5.4E-09	2.1E-06	(mg/kg/day)	NA	(mg/kg/day)	--				
				Benzene	2.22	ug/L	2.0E-07	(mg/kg/day)	5.5E-02	(mg/kg/day) ⁻¹	1.1E-08	7.0E-06	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.002				
				cis-1,2-Dichloroethene	132	ug/L	9.7E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.4E-04	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.03				
				Methylene Chloride	2.58	ug/L	5.7E-08	(mg/kg/day)	7.5E-03	(mg/kg/day) ⁻¹	4.3E-10	2.0E-06	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.00003				
				trans-1,2-Dichloroethene	11.6	ug/L	6.1E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.1E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.001				
				Trichloroethene	12.8	ug/L	1.3E-06	(mg/kg/day)	1.3E-02	(mg/kg/day) ⁻¹	1.6E-08	4.4E-05	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.00009				
				Vinyl Chloride	17.1	ug/L	5.2E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	7.8E-07	1.8E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.006				
				Aluminum	799	ug/L	1.6E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.6E-05	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00006				
				Arsenic	11.5	ug/L	2.3E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.5E-08	8.1E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.003				
				Chromium	3.24	ug/L	1.3E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.6E-07	(mg/kg/day)	7.5E-05	(mg/kg/day)	0.006				
				Iron	15878	ug/L	3.2E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.1E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.002				
				Lead	1.51	ug/L	3.0E-09	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.1E-07	(mg/kg/day)	NA	(mg/kg/day)	--				
				Manganese	137	ug/L	2.8E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	9.7E-06	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.01				
				Vanadium	5.33	ug/L	1.1E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.8E-07	(mg/kg/day)	2.6E-05	(mg/kg/day)	0.01				
							Exp. Route Total							8.5E-07					0.08	
						Exposure Point Total								3.6E-05						2.7
					Exposure Medium Total									3.6E-05						2.7
				Air	Air	Site 3	Inhalation	1,2,4-Trichlorobenzene	2.23	ug/L	1.8E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.3E-05	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.006
		1,2-Dichloroethane	2.06					ug/L	1.7E-06	(mg/kg/day)	9.1E-02	(mg/kg/day) ⁻¹	1.5E-07	5.8E-05	(mg/kg/day)	NA	(mg/kg/day)	--		
Benzene	2.22	ug/L	1.8E-06					(mg/kg/day)	5.5E-02	(mg/kg/day) ⁻¹	9.8E-08	6.3E-05	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.02				
cis-1,2-Dichloroethene	132	ug/L	1.1E-04					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.7E-03	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.4				
Methylene Chloride	2.58	ug/L	2.1E-06					(mg/kg/day)	7.5E-03	(mg/kg/day) ⁻¹	1.6E-08	7.3E-05	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.001				
trans-1,2-Dichloroethene	11.6	ug/L	9.3E-06					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.3E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.02				
Trichloroethene	12.8	ug/L	1.0E-05					(mg/kg/day)	1.3E-02	(mg/kg/day) ⁻¹	1.3E-07	3.6E-04	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.0007				
Vinyl Chloride	17.1	ug/L	1.4E-05					(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.1E-05	4.8E-04	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.2				
Aluminum	799	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--				
Arsenic	11.5	ug/L	0.0E+00					(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--				
Chromium	3.24	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	3.0E-03	(mg/kg/day)	--				
Iron	15878	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--				
Lead	1.51	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--				
Manganese	137	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.4E-02	(mg/kg/day)	--				
Vanadium	5.33	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E-03	(mg/kg/day)	--				
			Exp. Route Total											2.1E-05					0.6	
		Exposure Point Total												2.1E-05						0.6
	Exposure Medium Total													2.1E-05						3.3
Medium Total														5.7E-05						6.1

TABLE 7.6.CTE
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
 PAGE 3 OF 3

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units				
Surface Water	Surface Water	Site 3	Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	7.4E-08	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	1.0E-09	2.6E-06	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0001	
				Iron	3680	ug/L	1.4E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.0E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0007	
				Manganese	98.2	ug/L	3.8E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.3E-05	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.0006	
				Exp. Route Total								1.0E-09					0.001
			Dermal	Bis(2-ethylhexyl)phthalate	19.0	ug/L	9.4E-07	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	1.3E-08	3.3E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.002	
				Iron	3680	ug/L	8.1E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.8E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00004	
				Manganese	98.2	ug/L	2.2E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	7.5E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0008	
				Exp. Route Total							1.3E-08					0.002	
				Exposure Point Total							1.4E-08					0.004	
				Exposure Medium Total							1.4E-08					0.004	
	Medium Total							1.4E-08					0.004				
Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	8.4E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.9E-03	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.003	
				Arsenic	7.83	mg/kg	6.1E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	9.2E-08	2.1E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.007	
				Iron	7435	mg/kg	5.8E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.0E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.003	
				Vanadium	17.1	mg/kg	1.3E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.7E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.005	
				Exp. Route Total							9.2E-08					0.02	
			Dermal	Aluminum	10752	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--	
				Arsenic	7.83	mg/kg	2.1E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.1E-09	7.2E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0002	
				Iron	7435	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
				Vanadium	17.1	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
				Exp. Route Total							3.1E-09					0.0002	
	Exposure Point Total							9.5E-08					0.02				
	Exposure Medium Total							9.5E-08					0.02				
	Medium Total							9.5E-08					0.02				
Total of Receptor Risks Across All Media										5.8E-05	Total of Receptor Hazards Across All Media				6.3		

Note:
 Inhalation exposures are assumed to be equal to the exposures from ingestion of groundwater.

TABLE 7.7.CTE
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
 PAGE 1 OF 3

Scenario Timeframe: Future
 Receptor Population: Resident
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations						
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient		
							Value	Units	Value	Units		Value	Units	Value	Units			
Surface Soil	Surface Soil	Site 3	Ingestion	Benzo(a)pyrene Equivalents	0.265	mg/kg	1.2E-08	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	8.9E-08	1.2E-07	(mg/kg/day)	NA	(mg/kg/day)	--		
				Arsenic	3.66	mg/kg	1.7E-07	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.5E-07	1.7E-06	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.006		
				Iron	7331	mg/kg	3.4E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.4E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.005		
			Vanadium	12.0	mg/kg	5.5E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.5E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.005			
			Exp. Route Total								3.4E-07					0.02		
			Dermal	Benzo(a)pyrene Equivalents	0.265	mg/kg	1.8E-09	(mg/kg/day)	7.3E+00	(mg/kg/day) ⁻¹	1.3E-08	1.8E-08	(mg/kg/day)	NA	(mg/kg/day)	--		
		Arsenic	3.66	mg/kg	5.7E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	8.6E-09	5.7E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002				
		Iron	7331	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--				
		Vanadium	12.0	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--				
		Exp. Route Total								2.2E-08					0.0002			
		Exposure Point Total								3.6E-07						0.02		
		Exposure Medium Total								3.6E-07						0.02		
Medium Total								3.6E-07						0.02				
Subsurface Soil	Subsurface Soil	Site 3	Ingestion	Arsenic	1.17	mg/kg	5.4E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	8.0E-08	5.4E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002		
				Iron	2905	mg/kg	1.3E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.3E-03	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.002		
				Vanadium	7.48	mg/kg	3.4E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.4E-06	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.003		
			Exp. Route Total							8.0E-08						0.007		
			Dermal	Arsenic	1.17	mg/kg	1.8E-09	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.7E-09	1.8E-08	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00006		
			Iron	2905	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--			
		Vanadium	7.48	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--				
		Exp. Route Total								2.7E-09					0.00006			
		Exposure Point Total								8.3E-08						0.007		
		Exposure Medium Total								8.3E-08						0.007		
		Medium Total								8.3E-08						0.007		
		Groundwater	Groundwater	Site 3	Ingestion	1,2,4-Trichlorobenzene	2.23	ug/L	2.9E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.9E-05	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.003
1,2-Dichloroethane	2.06					ug/L	2.6E-06	(mg/kg/day)	9.1E-02	(mg/kg/day) ⁻¹	2.4E-07	2.6E-05	(mg/kg/day)	NA	(mg/kg/day)	--		
Benzene	2.22					ug/L	2.8E-06	(mg/kg/day)	5.5E-02	(mg/kg/day) ⁻¹	1.6E-07	2.8E-05	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.007		
cis-1,2-Dichloroethene	132					ug/L	1.7E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.7E-03	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.2		
Methylene Chloride	2.58					ug/L	3.3E-06	(mg/kg/day)	7.5E-03	(mg/kg/day) ⁻¹	2.5E-08	3.3E-05	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.0006		
trans-1,2-Dichloroethene	11.6					ug/L	1.5E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.5E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.007		
Trichloroethene	12.8					ug/L	1.6E-05	(mg/kg/day)	1.3E-02	(mg/kg/day) ⁻¹	2.1E-07	1.6E-04	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.0003		
Vinyl Chloride	17.1					ug/L	2.2E-05	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.3E-05	2.2E-04	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.07		
Aluminum	799					ug/L	1.0E-03	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.0E-02	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.01		
Arsenic	11.5					ug/L	1.5E-05	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	2.2E-05	1.5E-04	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.5		
Chromium	3.24					ug/L	4.2E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	4.2E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.01		
Iron	15878					ug/L	2.0E-02	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.0E-01	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.3		
Lead	1.51					ug/L	1.9E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.9E-05	(mg/kg/day)	NA	(mg/kg/day)	--		
Manganese	137					ug/L	1.8E-04	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.8E-03	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.07		
Vanadium	5.33					ug/L	6.8E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.8E-05	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.07		
Exp. Route Total												5.6E-05						1.2

TABLE 7.7.CTE
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
 PAGE 2 OF 3

Scenario Timeframe: Future
 Receptor Population: Resident
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations								
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient				
							Value	Units	Value	Units		Value	Units	Value	Units					
Groundwater	Groundwater	Site 3	Dermal	1,2,4-Trichlorobenzene	2.23	ug/L	3.5E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.5E-05	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.004				
				1,2-Dichloroethane	2.06	ug/L	1.2E-07	(mg/kg/day)	9.1E-02	(mg/kg/day) ⁻¹	1.1E-08	1.2E-06	(mg/kg/day)	NA	(mg/kg/day)	--				
				Benzene	2.22	ug/L	4.1E-07	(mg/kg/day)	5.5E-02	(mg/kg/day) ⁻¹	2.2E-08	4.1E-06	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.001				
				cis-1,2-Dichloroethene	132	ug/L	2.0E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.0E-04	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.02				
				Methylene Chloride	2.58	ug/L	1.2E-07	(mg/kg/day)	7.5E-03	(mg/kg/day) ⁻¹	8.8E-10	1.2E-06	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.00002				
				trans-1,2-Dichloroethene	11.6	ug/L	1.2E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.2E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0006				
				Trichloroethene	12.8	ug/L	2.6E-06	(mg/kg/day)	1.3E-02	(mg/kg/day) ⁻¹	3.4E-08	2.6E-05	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.00005				
				Vinyl Chloride	17.1	ug/L	1.1E-06	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.6E-06	1.1E-05	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.004				
				Aluminum	799	ug/L	3.3E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.3E-05	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.00003				
				Arsenic	11.5	ug/L	4.7E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	7.1E-08	4.7E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.002				
				Chromium	3.24	ug/L	2.7E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.7E-07	(mg/kg/day)	7.5E-05	(mg/kg/day)	0.004				
				Iron	15878	ug/L	6.5E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.5E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0009				
				Lead	1.51	ug/L	6.2E-09	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	6.2E-08	(mg/kg/day)	NA	(mg/kg/day)	--				
				Manganese	137	ug/L	5.6E-07	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.6E-06	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.006				
				Vanadium	5.33	ug/L	2.2E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.2E-07	(mg/kg/day)	2.6E-05	(mg/kg/day)	0.008				
							Exp. Route Total							1.7E-06					0.05	
						Exposure Point Total								5.7E-05						1.3
					Exposure Medium Total									5.7E-05						1.3
				Air	Air	Site 3	Inhalation	1,2,4-Trichlorobenzene	2.23	ug/L	2.9E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.9E-05	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.003
		1,2-Dichloroethane	2.06					ug/L	2.6E-06	(mg/kg/day)	9.1E-02	(mg/kg/day) ⁻¹	2.4E-07	2.6E-05	(mg/kg/day)	NA	(mg/kg/day)	--		
Benzene	2.22	ug/L	2.8E-06					(mg/kg/day)	5.5E-02	(mg/kg/day) ⁻¹	1.6E-07	2.8E-05	(mg/kg/day)	4.0E-03	(mg/kg/day)	0.007				
cis-1,2-Dichloroethene	132	ug/L	1.7E-04					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.7E-03	(mg/kg/day)	1.0E-02	(mg/kg/day)	0.2				
Methylene Chloride	2.58	ug/L	3.3E-06					(mg/kg/day)	7.5E-03	(mg/kg/day) ⁻¹	2.5E-08	3.3E-05	(mg/kg/day)	6.0E-02	(mg/kg/day)	0.0006				
trans-1,2-Dichloroethene	11.6	ug/L	1.5E-05					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.5E-04	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.007				
Trichloroethene	12.8	ug/L	1.6E-05					(mg/kg/day)	1.3E-02	(mg/kg/day) ⁻¹	2.1E-07	1.6E-04	(mg/kg/day)	5.0E-01	(mg/kg/day)	0.0003				
Vinyl Chloride	17.1	ug/L	2.2E-05					(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.3E-05	2.2E-04	(mg/kg/day)	3.0E-03	(mg/kg/day)	0.07				
Aluminum	799	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--				
Arsenic	11.5	ug/L	0.0E+00					(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	3.0E-04	(mg/kg/day)	--				
Chromium	3.24	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	3.0E-03	(mg/kg/day)	--				
Iron	15878	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--				
Lead	1.51	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	NA	(mg/kg/day)	--				
Manganese	137	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.4E-02	(mg/kg/day)	--				
Vanadium	5.33	ug/L	0.0E+00					(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E-03	(mg/kg/day)	--				
			Exp. Route Total											3.4E-05					0.3	
		Exposure Point Total												3.4E-05						0.3
	Exposure Medium Total													3.4E-05						1.5
Medium Total														9.1E-05						2.8

TABLE 7.7.CTE
 CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
 CENTRAL TENDENCY EXPOSURES
 NCBC GULFPORT, GULFPORT, MISSISSIPPI
 PAGE 3 OF 3

Scenario Timeframe: Future
 Receptor Population: Resident
 Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations					
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient	
							Value	Units	Value	Units		Value	Units				
Surface Water	Surface Water	Site 3	Ingestion	Bis(2-ethylhexyl)phthalate	19.0	ug/L	1.1E-08	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	1.6E-10	1.1E-07	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.000006	
				Iron	3680	ug/L	2.2E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.2E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00003	
				Manganese	98.2	ug/L	5.8E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.8E-07	(mg/kg/day)	2.4E-02	(mg/kg/day)	0.00002	
			Exp. Route Total									1.6E-10					0.00006
			Dermal	Bis(2-ethylhexyl)phthalate	19.0	ug/L	1.4E-06	(mg/kg/day)	1.4E-02	(mg/kg/day) ⁻¹	2.0E-08	1.4E-05	(mg/kg/day)	2.0E-02	(mg/kg/day)	0.0007	
				Iron	3680	ug/L	1.2E-06	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	1.2E-05	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.00002	
				Manganese	98.2	ug/L	3.3E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.3E-07	(mg/kg/day)	9.6E-04	(mg/kg/day)	0.0003	
			Exp. Route Total									2.0E-08					0.001
			Exposure Point Total									2.0E-08					0.001
			Exposure Medium Total									2.0E-08					0.001
Medium Total									2.0E-08					0.001			
Sediment	Sediment	Site 3	Ingestion	Aluminum	10752	mg/kg	3.2E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	3.2E-04	(mg/kg/day)	1.0E+00	(mg/kg/day)	0.0003	
				Arsenic	7.83	mg/kg	2.3E-08	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	3.4E-08	2.3E-07	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.0008	
				Iron	7435	mg/kg	2.2E-05	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	2.2E-04	(mg/kg/day)	7.0E-01	(mg/kg/day)	0.0003	
				Vanadium	17.1	mg/kg	5.0E-08	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	5.0E-07	(mg/kg/day)	1.0E-03	(mg/kg/day)	0.0005	
			Exp. Route Total									3.4E-08					0.002
			Dermal	Aluminum	10752	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	1.0E+00	(mg/kg/day)	--	
				Arsenic	7.83	mg/kg	7.9E-10	(mg/kg/day)	1.5E+00	(mg/kg/day) ⁻¹	1.2E-09	7.9E-09	(mg/kg/day)	3.0E-04	(mg/kg/day)	0.00003	
				Iron	7435	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	7.0E-01	(mg/kg/day)	--	
				Vanadium	17.1	mg/kg	0.0E+00	(mg/kg/day)	NA	(mg/kg/day) ⁻¹	--	0.0E+00	(mg/kg/day)	2.6E-05	(mg/kg/day)	--	
			Exp. Route Total									1.2E-09					0.00003
Exposure Point Total									3.6E-08					0.002			
Exposure Medium Total									3.6E-08					0.002			
Medium Total									3.6E-08					0.002			
Total of Receptor Risks Across All Media										9.1E-05	Total of Receptor Hazards Across All Media				2.8		

Note:
 Inhalation exposures are assumed to be equal to the exposures from ingestion of groundwater.

RAGS Part D Table 9

Summary Of Receptor Risks And Hazards For COPCs

LIST OF TABLES
RAGS PART D TABLE 9
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

Table No.

REASONABLE MAXIMUM EXPOSURES

9.1.RME	Construction Workers
9.2.RME	Maintenance Workers
9.3.RME	Industrial Workers
9.4.RME	Adolescent Trespassers
9.5.RME	Adult Trespassers
9.6.RME	Lifelong Trespassers
9.7.RME	Child Residents
9.8.RME	Adult Residents
9.9.RME	Lifelong Residents

CENTRAL TENDENCY EXPOSURES

9.1.CTE	Construction Workers
9.2.CTE	Maintenance Workers
9.3.CTE	Industrial Workers
9.4.CTE	Adolescent Trespassers
9.5.CTE	Adult Trespassers
9.6.CTE	Lifelong Trespassers
9.7.CTE	Child Residents
9.8.CTE	Adult Residents
9.9.CTE	Lifelong Residents

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 1 OF 2

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	9E-08	--	3E-08	--	1E-07	NA	--	--	--	--
			Arsenic	3E-07	--	2E-08	--	3E-07	Skin, CVS	0.04	--	0.004	0.04
			Iron	--	--	--	--	--	GS	0.03	--	--	0.03
			Vanadium	--	--	--	--	--	Kidney	0.04	--	--	0.04
			Chemical Total	3E-07	--	6E-08	--	4E-07		0.1	--	0.004	0.1
			Exposure Point Total					4E-07					0.1
Exposure Medium Total						4E-07					0.1		
Medium Total						4E-07					0.1		
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	8E-08	--	7E-09	--	9E-08	Skin, CVS	0.01	--	0.001	0.01
			Iron	--	--	--	--	--	GS	0.01	--	--	0.01
			Vanadium	--	--	--	--	--	Kidney	0.02	--	--	0.02
			Chemical Total	8E-08	--	7E-09	--	9E-08		0.05	--	0.001	0.05
			Exposure Point Total					9E-08					0.05
Exposure Medium Total						9E-08					0.05		
Medium Total						9E-08					0.05		
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--	Kidney	--	--	0.0003	0.0003
			1,2-Dichloroethane	--	--	2E-10	--	2E-10	None Reported	--	--	--	--
			Benzene	--	--	4E-10	--	4E-10	Blood	--	--	0.0001	0.0001
			cis-1,2-Dichloroethene	--	--	--	--	--	Blood	--	--	0.003	0.003
			Methylene Chloride	--	--	2E-11	--	2E-11	Liver	--	--	0.000003	0.000003
			trans-1,2-Dichloroethene	--	--	--	--	--	Blood	--	--	0.00008	0.00008
			Trichloroethene	--	--	5E-10	--	5E-10	Liver	--	--	0.000006	0.000006
			Vinyl Chloride	--	--	2E-08	--	2E-08	Liver	--	--	0.0005	0.0005
			Aluminum	--	--	--	--	--	CNS	--	--	0.00001	0.00001
			Arsenic	--	--	4E-09	--	4E-09	Skin, CVS	--	--	0.0006	0.0006
			Chromium	--	--	--	--	--	Fetotoxicity, GS, Bone	--	--	0.001	0.001
			Iron	--	--	--	--	--	GS	--	--	0.0004	0.0004
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	--	0.002	0.002
			Vanadium	--	--	--	--	--	Kidney	--	--	0.003	0.003
			Chemical Total	--	--	2E-08	--	2E-08		--	--	0.01	0.01
			Exposure Point Total						2E-08				
Exposure Medium Total						2E-08					0.01		

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 2 OF 2

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--	NA	--	--	--	--
			1,2-Dichloroethane	--	1E-09	--	--	1E-09	NA	--	0.000001	--	0.000001
			Benzene	--	4E-10	--	--	4E-10	Blood	--	0.0001	--	0.0001
			cis-1,2-Dichloroethene	--	--	--	--	--	Blood	--	--	--	--
			Methylene Chloride	--	3E-11	--	--	3E-11	Liver	--	0.000004	--	0.000004
			trans-1,2-Dichloroethene	--	--	--	--	--	Blood	--	0.0003	--	0.0003
			Trichloroethene	--	4.8E-10	--	--	5E-10	NA	--	0.00003	--	0.00003
			Vinyl Chloride	--	2E-09	--	--	2E-09	Liver	--	0.0003	--	0.0003
			Aluminum	--	--	--	--	--	CNS	--	--	--	--
			Arsenic	--	--	--	--	--	NA	--	--	--	--
			Chromium	--	--	--	--	--	Lungs	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	--	--	--
Vanadium	--	--	--	--	--	NA	--	--	--	--			
			Chemical Total	--	4E-09	--	--	4E-09		--	0.0008	--	0.0008
		Exposure Point Total						4E-09					0.0008
	Exposure Medium Total							4E-09					0.0008
Medium Total								3E-08					0.01
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	4E-11	--	3E-09	--	3E-09	Liver	0.00001	--	0.0008	0.0008
			Iron	--	--	--	--	--	GS	0.00006	--	0.00002	0.00008
			Manganese	--	--	--	--	--	CNS	0.00005	--	0.0004	0.0004
			Chemical Total	4E-11	--	3E-09	--	3E-09		0.0001	--	0.001	0.001
		Exposure Point Total						3E-09				0.001	
	Exposure Medium Total							3E-09				0.001	
Medium Total								3E-09				0.001	
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS	0.004	--	--	0.004
			Arsenic	6E-08	--	6E-09	--	7E-08	Skin, CVS	0.01	--	0.0009	0.01
			Iron	--	--	--	--	--	GS	0.004	--	--	0.004
			Vanadium	--	--	--	--	--	Kidney	0.007	--	--	0.007
			Chemical Total	6E-08	--	6E-09	--	7E-08		0.03	--	0.0009	0.03
		Exposure Point Total						7E-08				0.03	
	Exposure Medium Total							7E-08				0.03	
Medium Total								7E-08				0.03	
Receptor Total								6E-07				Receptor HI Total	0.2

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Receptor Population: Maintenance Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	6E-08	--	6E-08	--	1E-07	NA	--	--	--	--
			Arsenic	2E-07	--	4E-08	--	2E-07	Skin, CVS	0.001	--	0.0002	0.001
			Iron	--	--	--	--	--	GS	0.0010	--	--	0.0010
			Vanadium	--	--	--	--	--	Kidney	0.001	--	--	0.001
			Chemical Total	2E-07	--	9E-08	--	3E-07		0.003	--	0.0002	0.003
		Exposure Point Total					3E-07					0.003	
Exposure Medium Total						3E-07					0.003		
Medium Total						3E-07					0.003		
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	6E-08	--	1E-08	--	7E-08	Skin, CVS	0.0004	--	0.00007	0.0004
			Iron	--	--	--	--	--	GS	0.0004	--	--	0.0004
			Vanadium	--	--	--	--	--	Kidney	0.0007	--	--	0.0007
			Chemical Total	6E-08	--	1E-08	--	7E-08		0.001	--	0.00007	0.002
			Exposure Point Total					7E-08					0.002
		Exposure Medium Total						7E-08					0.002
Medium Total						7E-08					0.002		
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	9E-10	--	7E-08	--	7E-08	Liver	0.000009	--	0.0007	0.0007
			Iron	--	--	--	--	--	GS	0.00005	--	0.00002	0.00007
			Manganese	--	--	--	--	--	CNS	0.00004	--	0.0003	0.0004
			Chemical Total	9E-10	--	7E-08	--	7E-08		0.00010	--	0.0010	0.001
			Exposure Point Total					7E-08					0.001
		Exposure Medium Total						7E-08					0.001
Medium Total						7E-08					0.001		
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS	0.001	--	--	0.001
			Arsenic	4E-07	--	8E-08	--	5E-07	Skin, CVS	0.002	--	0.0005	0.003
			Iron	--	--	--	--	--	GS	0.0010	--	--	0.0010
			Vanadium	--	--	--	--	--	Kidney	0.002	--	--	0.002
			Chemical Total	4E-07	--	8E-08	--	5E-07		0.006	--	0.0005	0.007
		Exposure Point Total					5E-07					0.007	
Exposure Medium Total						5E-07					0.007		
Medium Total						5E-07					0.007		
Receptor Total				Receptor Risk Total				1E-06	Receptor HI Total				0.01

TABLE 9.3.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Receptor Population: Industrial Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	7E-07	--	6E-07	--	1E-06	NA	--	--	--	--
			Arsenic	2E-06	--	4E-07	--	2E-06	Skin, CVS	0.01	--	0.002	0.01
			Iron	--	--	--	--	--	GS	0.01	--	--	0.01
			Vanadium	--	--	--	--	--	Kidney	0.01	--	--	0.01
			Chemical Total	3E-06	--	1E-06	--	4E-06		0.03	--	0.002	0.04
		Exposure Point Total					4E-06					0.04	
	Exposure Medium Total					4E-06					0.04		
Medium Total						4E-06					0.04		
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	6E-07	--	1E-07	--	7E-07	Skin, CVS	0.004	--	0.0008	0.005
			Iron	--	--	--	--	--	GS	0.004	--	--	0.004
			Vanadium	--	--	--	--	--	Kidney	0.007	--	--	0.007
			Chemical Total	6E-07	--	1E-07	--	7E-07		0.02	--	0.0008	0.02
			Exposure Point Total					7E-07					0.02
		Exposure Medium Total					7E-07					0.02	
Medium Total						7E-07					0.02		
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	9E-10	--	7E-08	--	7E-08	Liver	0.000009	--	0.0007	0.0007
			Iron	--	--	--	--	--	GS	0.00005	--	0.00002	0.00007
			Manganese	--	--	--	--	--	CNS	0.00004	--	0.0003	0.0004
			Chemical Total	9E-10	--	7E-08	--	7E-08		0.00010	--	0.0010	0.001
			Exposure Point Total					7E-08					0.001
		Exposure Medium Total					7E-08					0.001	
Medium Total						7E-08					0.001		
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS	0.0005	--	--	0.0005
			Arsenic	2E-07	--	8E-08	--	3E-07	Skin, CVS	0.001	--	0.0005	0.002
			Iron	--	--	--	--	--	GS	0.0005	--	--	0.0005
			Vanadium	--	--	--	--	--	Kidney	0.0008	--	--	0.0008
			Chemical Total	2E-07	--	8E-08	--	3E-07		0.003	--	0.0005	0.004
		Exposure Point Total					3E-07					0.004	
	Exposure Medium Total					3E-07					0.004		
Medium Total						3E-07					0.004		
Receptor Total						Receptor Risk Total	5E-06				Receptor HI Total	0.06	

TABLE 9.4.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Receptor Population: Trespassers
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	2E-07	--	5E-08	--	2E-07	NA	--	--	--	--
			Arsenic	2E-07	--	3E-08	--	2E-07	Skin, CVS	0.002	--	0.0004	0.003
			Iron	--	--	--	--	--	GS	0.002	--	--	0.002
			Vanadium	--	--	--	--	--	Kidney	0.002	--	--	0.002
			Chemical Total	3E-07	--	8E-08	--	4E-07		0.006	--	0.0004	0.007
		Exposure Point Total					4E-07					0.007	
	Exposure Medium Total					4E-07					0.007		
Medium Total						4E-07					0.007		
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	5E-08	--	1E-08	--	6E-08	Skin, CVS	0.0007	--	0.0001	0.0009
			Iron	--	--	--	--	--	GS	0.0008	--	--	0.0008
			Vanadium	--	--	--	--	--	Kidney	0.001	--	--	0.001
			Chemical Total	5E-08	--	1E-08	--	6E-08		0.003	--	0.0001	0.003
			Exposure Point Total					6E-08					0.003
		Exposure Medium Total					6E-08					0.003	
Medium Total						6E-08					0.003		
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	4E-09	--	6E-08	--	6E-08	Liver	0.00009	--	0.001	0.001
			Iron	--	--	--	--	--	GS	0.0005	--	0.00003	0.0005
			Manganese	--	--	--	--	--	CNS	0.0004	--	0.0006	0.0010
			Chemical Total	4E-09	--	6E-08	--	6E-08		0.0009	--	0.002	0.003
			Exposure Point Total					6E-08					0.003
		Exposure Medium Total					6E-08					0.003	
Medium Total						6E-08					0.003		
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS	0.002	--	--	0.002
			Arsenic	3E-07	--	7E-08	--	4E-07	Skin, CVS	0.005	--	0.0009	0.006
			Iron	--	--	--	--	--	GS	0.002	--	--	0.002
			Vanadium	--	--	--	--	--	Kidney	0.003	--	--	0.003
			Chemical Total	3E-07	--	7E-08	--	4E-07		0.01	--	0.0009	0.01
		Exposure Point Total					4E-07					0.01	
Exposure Medium Total					4E-07					0.01			
Medium Total						4E-07					0.01		
Receptor Total						Receptor Risk Total	9E-07			Receptor HI Total	0.03		

TABLE 9.5.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Receptor Population: Trespassers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	6E-08	--	3E-08	--	9E-08	NA	--	--	--	--
			Arsenic	2E-07	--	2E-08	--	2E-07	Skin, CVS	0.001	--	0.0002	0.002
			Iron	--	--	--	--	--	GS	0.001	--	--	0.001
			Vanadium	--	--	--	--	--	Kidney	0.001	--	--	0.001
			Chemical Total	2E-07	--	5E-08	--	3E-07		0.004	--	0.0002	0.004
		Exposure Point Total					3E-07					0.004	
	Exposure Medium Total					3E-07					0.004		
Medium Total						3E-07					0.004		
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	6E-08	--	7E-09	--	6E-08	Skin, CVS	0.0005	--	0.00005	0.0005
			Iron	--	--	--	--	--	GS	0.0005	--	--	0.0005
			Vanadium	--	--	--	--	--	Kidney	0.0009	--	--	0.0009
			Chemical Total	6E-08	--	7E-09	--	6E-08		0.002	--	0.00005	0.002
			Exposure Point Total					6E-08					0.002
		Exposure Medium Total					6E-08					0.002	
Medium Total						6E-08					0.002		
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	8E-10	--	1E-07	--	1E-07	Liver	0.00001	--	0.001	0.001
			Iron	--	--	--	--	--	GS	0.00006	--	0.00004	0.00010
			Manganese	--	--	--	--	--	CNS	0.00005	--	0.0007	0.0007
			Chemical Total	8E-10	--	1E-07	--	1E-07		0.0001	--	0.002	0.002
			Exposure Point Total					1E-07					0.002
		Exposure Medium Total					1E-07					0.002	
Medium Total						1E-07					0.002		
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS	0.001	--	--	0.001
			Arsenic	4E-07	--	4E-08	--	4E-07	Skin, CVS	0.003	--	0.0004	0.003
			Iron	--	--	--	--	--	GS	0.001	--	--	0.001
			Vanadium	--	--	--	--	--	Kidney	0.002	--	--	0.002
			Chemical Total	4E-07	--	4E-08	--	4E-07		0.008	--	0.0004	0.008
		Exposure Point Total					4E-07					0.008	
	Exposure Medium Total					4E-07					0.008		
Medium Total						4E-07					0.008		
Receptor Total						Receptor Risk Total	9E-07				Receptor HI Total	0.02	

TABLE 9.6.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Receptor Population: Trespassers
Receptor Age: Lifelong (Adolescent and Adult)

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	2E-07	--	8E-08	--	3E-07						
			Arsenic	3E-07	--	5E-08	--	4E-07						
			Iron	--	--	--	--	--						
			Vanadium	--	--	--	--	--						
			Chemical Total	6E-07	--	1E-07	--	7E-07						
		Exposure Point Total						7E-07						
Exposure Medium Total							7E-07							
Medium Total													7E-07	
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	1E-07	--	2E-08	--	1E-07						
			Iron	--	--	--	--	--						
			Vanadium	--	--	--	--	--						
			Chemical Total	1E-07	--	2E-08	--	1E-07						
			Exposure Point Total											1E-07
		Exposure Medium Total												1E-07
Medium Total													1E-07	
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	5E-09	--	2E-07	--	2E-07						
			Iron	--	--	--	--	--						
			Manganese	--	--	--	--	--						
			Chemical Total	5E-09	--	2E-07	--	2E-07						
			Exposure Point Total											2E-07
		Exposure Medium Total												2E-07
Medium Total													2E-07	
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--						
			Arsenic	7E-07	--	1E-07	--	8E-07						
			Iron	--	--	--	--	--						
			Vanadium	--	--	--	--	--						
			Chemical Total	7E-07	--	1E-07	--	8E-07						
		Exposure Point Total						8E-07						
Exposure Medium Total							8E-07							
Medium Total													8E-07	
Receptor Total				Receptor Risk Total					2E-06					

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 1 OF 3

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	1E-05	--	4E-06	--	2E-05	NA	--	--	--	--
			Arsenic	6E-06	--	5E-07	--	7E-06	Skin, CVS	0.2	--	0.01	0.2
			Iron	--	--	--	--	--	GS	0.1	--	--	0.1
			Vanadium	--	--	--	--	--	Kidney	0.2	--	--	0.2
			Chemical Total	2E-05	--	5E-06	--	2E-05		0.4	--	0.01	0.5
		Exposure Point Total					2E-05					0.5	
	Exposure Medium Total					2E-05					0.5		
Medium Total						2E-05					0.5		
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	6E-07	--	5E-08	--	7E-07	Skin, CVS	0.05	--	0.001	0.05
			Iron	--	--	--	--	--	GS	0.05	--	--	0.05
			Vanadium	--	--	--	--	--	Kidney	0.10	--	--	0.10
			Chemical Total	6E-07	--	5E-08	--	7E-07		0.2	--	0.001	0.2
		Exposure Point Total					7E-07					0.2	
	Exposure Medium Total					7E-07					0.2		
Medium Total						7E-07					0.2		
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--	Kidney	0.02	--	0.01	0.03
			1,2-Dichloroethane	2E-06	--	3E-08	--	2E-06	None Reported	--	--	--	--
			Benzene	1E-06	--	6E-08	--	1E-06	Blood	0.05	--	0.003	0.06
			cis-1,2-Dichloroethene	--	--	--	--	--	Blood	1	--	0.06	1
			Methylene Chloride	2E-07	--	2E-09	--	2E-07	Liver	0.004	--	0.00006	0.004
			trans-1,2-Dichloroethene	--	--	--	--	--	Blood	0.06	--	0.002	0.06
			Trichloroethene	1E-06	--	8E-08	--	1E-06	Liver	0.002	--	0.0002	0.003
			Vinyl Chloride	2E-04	--	4E-06	--	2E-04	Liver	0.5	--	0.01	0.6
			Aluminum	--	--	--	--	--	CNS	0.08	--	0.0001	0.08
			Arsenic	1E-04	--	2E-07	--	1E-04	Skin, CVS	4	--	0.005	4
			Chromium	--	--	--	--	--	Fetotoxicity, GS, Bone	0.1	--	0.01	0.1
			Iron	--	--	--	--	--	GS	2	--	0.003	2
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.5	--	0.02	0.6
			Vanadium	--	--	--	--	--	Kidney	0.5	--	0.03	0.5
			Chemical Total	4E-04	--	4E-06	--	4E-04		9	--	0.2	9
		Exposure Point Total					4E-04					9	
	Exposure Medium Total					4E-04				9			

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 2 OF 3

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient						
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total		
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--	NA	--	0.02	--	0.02		
			1,2-Dichloroethane	--	2E-06	--	--	2E-06	NA	--	--	--	--	--	
			Benzene	--	1E-06	--	--	1E-06	Blood	--	0.05	--	0.05	0.05	
			cis-1,2-Dichloroethene	--	--	--	--	--	Blood	--	1	--	1	1	
			Methylene Chloride	--	2E-07	--	--	2E-07	Liver	--	0.004	--	0.004	0.004	
			trans-1,2-Dichloroethene	--	--	--	--	--	Blood	--	0.06	--	0.06	0.06	
			Trichloroethene	--	1E-06	--	--	1E-06	NA	--	0.002	--	0.002	0.002	
			Vinyl Chloride	--	2E-04	--	--	2E-04	Liver	--	0.5	--	0.5	0.5	
			Aluminum	--	--	--	--	--	CNS	--	--	--	--	--	--
			Arsenic	--	--	--	--	--	NA	--	--	--	--	--	--
			Chromium	--	--	--	--	--	Lungs	--	--	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	--	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--	--	--
			Chemical Total	--	2E-04	--	--	2E-04		--	2	--	2		
		Exposure Point Total						2E-04					2		
	Exposure Medium Total							2E-04					2		
Medium Total								6E-04					11		
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	6E-09	--	8E-08	--	8E-08	Liver	0.0003	--	0.003	0.004		
			Iron	--	--	--	--	--	GS	0.001	--	0.00008	0.002		
			Manganese	--	--	--	--	--	CNS	0.001	--	0.002	0.003		
			Chemical Total	6E-09	--	8E-08	--	8E-08		0.003	--	0.005	0.008		
			Exposure Point Total					8E-08					0.008		
	Exposure Medium Total					8E-08					0.008				
Medium Total								8E-08				0.008			
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS	0.01	--	--	0.01		
			Arsenic	1E-06	--	9E-08	--	1E-06	Skin, CVS	0.03	--	0.002	0.03		
			Iron	--	--	--	--	--	GS	0.01	--	--	0.01		
			Vanadium	--	--	--	--	--	Kidney	0.02	--	--	0.02		
			Chemical Total	1E-06	--	9E-08	--	1E-06		0.07	--	0.002	0.07		
	Exposure Point Total					1E-06					0.07				
	Exposure Medium Total					1E-06					0.07				
Medium Total								1E-06				0.07			
Receptor Total							Receptor Risk Total	6E-04		Receptor HI Total		12			

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 3 OF 3

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient												
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total								

Note:
Inhalation exposures are assumed to be equal to the exposures from ingestion of groundwater.

Total Blood HI	3
Total CNS HI	0.7
Total CVS HI	4
Total GS HI	2
Total Kidney HI	0.8
Total Liver HI	1
Total Skin HI	4

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 1 OF 3

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	2E-06	--	9E-07	--	3E-06	NA	--	--	--	--	
			Arsenic	3E-06	--	3E-07	--	3E-06	Skin, CVS	0.02	--	0.002	0.02	
			Iron	--	--	--	--	--	GS	0.01	--	--	0.01	
			Vanadium	--	--	--	--	--	Kidney	0.02	--	--	0.02	
			Chemical Total	4E-06	--	1E-06	--	5E-06		0.05	--	0.002	0.05	
			Exposure Point Total					5E-06					0.05	
Exposure Medium Total						5E-06					0.05			
Medium Total								5E-06				0.05		
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	3E-07	--	4E-08	--	4E-07	Skin, CVS	0.005	--	0.0003	0.006	
			Iron	--	--	--	--	--	GS	0.006	--	--	0.006	
			Vanadium	--	--	--	--	--	Kidney	0.01	--	--	0.01	
			Chemical Total	3E-07	--	4E-08	--	4E-07		0.02	--	0.0003	0.02	
			Exposure Point Total					4E-07					0.02	
			Exposure Medium Total						4E-07					0.02
Medium Total								4E-07				0.02		
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--	Kidney	0.006	--	0.006	0.01	
			1,2-Dichloroethane	2E-06	--	7E-08	--	2E-06	None Reported	--	--	--	--	
			Benzene	1E-06	--	1E-07	--	1E-06	Blood	0.02	--	0.002	0.02	
			cis-1,2-Dichloroethene	--	--	--	--	--	Blood	0.4	--	0.03	0.4	
			Methylene Chloride	2E-07	--	5E-09	--	2E-07	Liver	0.001	--	0.00003	0.001	
			trans-1,2-Dichloroethene	--	--	--	--	--	Blood	0.02	--	0.001	0.02	
			Trichloroethene	2E-06	--	2E-07	--	2E-06	Liver	0.0007	--	0.00009	0.0008	
			Vinyl Chloride	2E-04	--	9E-06	--	3E-04	Liver	0.2	--	0.006	0.2	
			Aluminum	--	--	--	--	--	CNS	0.02	--	0.00007	0.02	
			Arsenic	2E-04	--	5E-07	--	2E-04	Skin, CVS	1	--	0.003	1	
			Chromium	--	--	--	--	--	Fetotoxicity, GS, Bone	0.03	--	0.007	0.04	
			Iron	--	--	--	--	--	GS	0.6	--	0.002	0.6	
			Lead	--	--	--	--	--	NA	--	--	--	--	
			Manganese	--	--	--	--	--	CNS	0.2	--	0.01	0.2	
			Vanadium	--	--	--	--	--	Kidney	0.1	--	0.02	0.2	
			Chemical Total	4E-04	--	1E-05	--	4E-04		3	--	0.09	3	
			Exposure Point Total						4E-04					3
			Exposure Medium Total						4E-04					3

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 2 OF 3

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--	NA	--	0.006	--	0.006	
			1,2-Dichloroethane	--	2E-06	--	--	2E-06	NA	--	--	--	--	--
			Benzene	--	1E-06	--	--	1E-06	Blood	--	0.02	--	0.02	0.02
			cis-1,2-Dichloroethene	--	--	--	--	--	Blood	--	0.4	--	0.4	0.4
			Methylene Chloride	--	2E-07	--	--	2E-07	Liver	--	0.001	--	0.001	0.001
			trans-1,2-Dichloroethene	--	--	--	--	--	Blood	--	0.02	--	0.02	0.02
			Trichloroethene	--	2E-06	--	--	2E-06	NA	--	0.0007	--	0.0007	0.0007
			Vinyl Chloride	--	2E-04	--	--	2E-04	Liver	--	0.2	--	0.2	0.2
			Aluminum	--	--	--	--	--	CNS	--	--	--	--	--
			Arsenic	--	--	--	--	--	NA	--	--	--	--	--
			Chromium	--	--	--	--	--	Lungs	--	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--	--
			Chemical Total	--	2E-04	--	--	2E-04		--	0.6	--	0.6	
		Exposure Point Total						2E-04					0.6	
	Exposure Medium Total							2E-04					0.6	
Medium Total								7E-04					3	
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	1E-09	--	1E-07	--	1E-07	Liver	0.00001	--	0.001	0.001	
			Iron	--	--	--	--	--	GS	0.00006	--	0.00004	0.00010	
			Manganese	--	--	--	--	--	CNS	0.00005	--	0.0007	0.0007	
			Chemical Total	1E-09	--	1E-07	--	1E-07		0.0001	--	0.002	0.002	
			Exposure Point Total					1E-07					0.002	
	Exposure Medium Total					1E-07					0.002			
Medium Total						1E-07					0.002			
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS	0.001	--	--	0.001	
			Arsenic	5E-07	--	6E-08	--	5E-07	Skin, CVS	0.003	--	0.0004	0.003	
			Iron	--	--	--	--	--	GS	0.001	--	--	0.001	
			Vanadium	--	--	--	--	--	Kidney	0.002	--	--	0.002	
			Chemical Total	5E-07	--	6E-08	--	5E-07		0.008	--	0.0004	0.008	
	Exposure Point Total					5E-07					0.008			
	Exposure Medium Total					5E-07					0.008			
Medium Total						5E-07					0.008			
Receptor Total							Receptor Risk Total	7E-04			Receptor HI Total	3		

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 3 OF 3

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient													
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total									

Note:
Inhalation exposures are assumed to be equal to the exposures from ingestion of groundwater.

Total Blood HI	0.8
Total CNS HI	0.2
Total CVS HI	1
Total GS HI	0.7
Total Kidney HI	0.2
Total Liver HI	0.3
Total Skin HI	1

TABLE 9.9.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 1 OF 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Lifelong (Child and Adult)

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	1E-05	--	5E-06	--	2E-05					
			Arsenic	9E-06	--	8E-07	--	9E-06					
			Iron	--	--	--	--	--					
			Vanadium	--	--	--	--	--					
			Chemical Total	2E-05	--	6E-06	--	3E-05					
		Exposure Point Total						3E-05					
		Exposure Medium Total						3E-05					
Medium Total								3E-05					
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	1E-06	--	9E-08	--	1E-06					
			Iron	--	--	--	--	--					
			Vanadium	--	--	--	--	--					
			Chemical Total	1E-06	--	9E-08	--	1E-06					
					Exposure Point Total						1E-06		
		Exposure Medium Total						1E-06					
Medium Total								1E-06					
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--					
			1,2-Dichloroethane	3E-06	--	9E-08	--	3E-06					
			Benzene	2E-06	--	2E-07	--	2E-06					
			cis-1,2-Dichloroethene	--	--	--	--	--					
			Methylene Chloride	3E-07	--	7E-09	--	3E-07					
			trans-1,2-Dichloroethene	--	--	--	--	--					
			Trichloroethene	3E-06	--	3E-07	--	3E-06					
			Vinyl Chloride	5E-04	--	1E-05	--	5E-04					
			Aluminum	--	--	--	--	--					
			Arsenic	3E-04	--	7E-07	--	3E-04					
			Chromium	--	--	--	--	--					
			Iron	--	--	--	--	--					
			Lead	--	--	--	--	--					
			Manganese	--	--	--	--	--					
			Vanadium	--	--	--	--	--					
		Exposure Point Total						8E-04					
		Exposure Medium Total						8E-04					

TABLE 9.9.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 2 OF 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Lifelong (Child and Adult)

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--					
			1,2-Dichloroethane	--	3E-06	--	--	3E-06					
			Benzene	--	2E-06	--	--	2E-06					
			cis-1,2-Dichloroethene	--	--	--	--	--					
			Methylene Chloride	--	3E-07	--	--	3E-07					
			trans-1,2-Dichloroethene	--	--	--	--	--					
			Trichloroethene	--	3E-06	--	--	3E-06					
			Vinyl Chloride	--	5E-04	--	--	5E-04					
			Aluminum	--	--	--	--	--					
			Arsenic	--	--	--	--	--					
			Chromium	--	--	--	--	--					
			Iron	--	--	--	--	--					
			Lead	--	--	--	--	--					
			Manganese	--	--	--	--	--					
Vanadium	--	--	--	--	--								
			Chemical Total	--	5E-04	--	--	5E-04					
		Exposure Point Total						5E-04					
	Exposure Medium Total							5E-04					
Medium Total								1E-03					
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	7E-09	--	2E-07	--	2E-07					
			Iron	--	--	--	--	--					
			Manganese	--	--	--	--	--					
			Chemical Total	7E-09	--	2E-07	--	2E-07					
			Exposure Point Total					2E-07					
	Exposure Medium Total					2E-07							
Medium Total								2E-07					
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--					
			Arsenic	2E-06	--	1E-07	--	2E-06					
			Iron	--	--	--	--	--					
			Vanadium	--	--	--	--	--					
			Chemical Total	2E-06	--	1E-07	--	2E-06					
	Exposure Point Total					2E-06							
	Exposure Medium Total					2E-06							
Medium Total								2E-06					
Receptor Total								Receptor Risk Total					1E-03

Note:
Inhalation exposures are assumed to be equal to the exposures from ingestion of groundwater.

TABLE 9.1.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
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Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	2E-08	--	6E-09	--	3E-08	NA	--	--	--	--
			Arsenic	6E-08	--	4E-09	--	7E-08	Skin, CVS	0.010	--	0.0006	0.01
			Iron	--	--	--	--	--	GS	0.008	--	--	0.008
			Vanadium	--	--	--	--	--	Kidney	0.010	--	--	0.010
			Chemical Total	9E-08	--	1E-08	--	1E-07		0.03	--	0.0006	0.03
		Exposure Point Total					1E-07					0.03	
	Exposure Medium Total					1E-07					0.03		
Medium Total						1E-07					0.03		
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	2E-08	--	1E-09	--	2E-08	Skin, CVS	0.003	--	0.0002	0.003
			Iron	--	--	--	--	--	GS	0.003	--	--	0.003
			Vanadium	--	--	--	--	--	Kidney	0.006	--	--	0.006
			Chemical Total	2E-08	--	1E-09	--	2E-08		0.01	--	0.0002	0.01
		Exposure Point Total					2E-08					0.01	
	Exposure Medium Total					2E-08					0.01		
Medium Total						2E-08					0.01		
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--	Kidney	--	--	0.0001	0.0001
			1,2-Dichloroethane	--	--	6E-11	--	6E-11	None Reported	--	--	--	--
			Benzene	--	--	1E-10	--	1E-10	Blood	--	--	0.00004	0.00004
			cis-1,2-Dichloroethene	--	--	--	--	--	Blood	--	--	0.0007	0.0007
			Methylene Chloride	--	--	5E-12	--	5E-12	Liver	--	--	0.0000008	0.0000008
			trans-1,2-Dichloroethene	--	--	--	--	--	Blood	--	--	0.00002	0.00002
			Trichloroethene	--	--	2E-10	--	2E-10	Liver	--	--	0.000002	0.000002
			Vinyl Chloride	--	--	5E-09	--	5E-09	Liver	--	--	0.0002	0.0002
			Aluminum	--	--	--	--	--	CNS	--	--	0.000003	0.000003
			Arsenic	--	--	1E-09	--	1E-09	Skin, CVS	--	--	0.0001	0.0001
			Chromium	--	--	--	--	--	Fetotoxicity, GS, Bone	--	--	0.0003	0.0003
			Iron	--	--	--	--	--	GS	--	--	0.00009	0.00009
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	--	0.0006	0.0006
			Vanadium	--	--	--	--	--	Kidney	--	--	0.0008	0.0008
			Chemical Total	--	--	6E-09	--	6E-09		--	--	0.003	0.003
Exposure Point Total					6E-09					0.003			
	Exposure Medium Total				6E-09					0.003			

TABLE 9.1.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 2 OF 2

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--	NA	--	--	--	--
			1,2-Dichloroethane	--	3E-10	--	--	3E-10	NA	--	0.0000003	--	0.0000003
			Benzene	--	1E-10	--	--	1E-10	Blood	--	0.00003	--	0.00003
			cis-1,2-Dichloroethene	--	--	--	--	--	Blood	--	--	--	--
			Methylene Chloride	--	7E-12	--	--	7E-12	Liver	--	0.0000010	--	0.0000010
			trans-1,2-Dichloroethene	--	--	--	--	--	Blood	--	0.00008	--	0.00008
			Trichloroethene	--	1E-10	--	--	1E-10	NA	--	0.000007	--	0.000007
			Vinyl Chloride	--	5E-10	--	--	5E-10	Liver	--	0.00008	--	0.00008
			Aluminum	--	--	--	--	--	CNS	--	--	--	--
			Arsenic	--	--	--	--	--	NA	--	--	--	--
			Chromium	--	--	--	--	--	Lungs	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--
			Chemical Total	--	1E-09	--	--	1E-09		--	0.0002	--	0.0002
			Exposure Point Total										
			Exposure Medium Total										
Medium Total													
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	2E-11	--	2E-09	--	2E-09	Liver	0.000006	--	0.0004	0.0004
			Iron	--	--	--	--	--	GS	0.00003	--	0.00001	0.00004
			Manganese	--	--	--	--	--	CNS	0.00002	--	0.0002	0.0002
			Chemical Total	2E-11	--	2E-09	--	2E-09		0.00006	--	0.0006	0.0007
			Exposure Point Total										
			Exposure Medium Total										
Medium Total													
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS	0.001	--	--	0.001
			Arsenic	2E-08	--	1E-09	--	2E-08	Skin, CVS	0.003	--	0.0002	0.003
			Iron	--	--	--	--	--	GS	0.001	--	--	0.001
			Vanadium	--	--	--	--	--	Kidney	0.002	--	--	0.002
			Chemical Total	2E-08	--	1E-09	--	2E-08		0.006	--	0.0002	0.006
			Exposure Point Total										
			Exposure Medium Total										
Medium Total													
Receptor Total				Receptor Risk Total					Receptor HI Total				

TABLE 9.2.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Receptor Population: Maintenance Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	6E-09	--	1E-09	--	7E-09	NA	--	--	--	--
			Arsenic	2E-08	--	7E-10	--	2E-08	Skin, CVS	0.0003	--	0.00001	0.0003
			Iron	--	--	--	--	--	GS	0.0002	--	--	0.0002
			Vanadium	--	--	--	--	--	Kidney	0.0003	--	--	0.0003
			Chemical Total	2E-08	--	2E-09	--	2E-08		0.0008	--	0.00001	0.0008
		Exposure Point Total					2E-08					0.0008	
	Exposure Medium Total					2E-08					0.0008		
Medium Total						2E-08					0.0008		
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	5E-09	--	2E-10	--	6E-09	Skin, CVS	0.00009	--	0.000004	0.00010
			Iron	--	--	--	--	--	GS	0.00010	--	--	0.00010
			Vanadium	--	--	--	--	--	Kidney	0.0002	--	--	0.0002
			Chemical Total	5E-09	--	2E-10	--	6E-09		0.0004	--	0.000004	0.0004
			Exposure Point Total					6E-09					0.0004
		Exposure Medium Total					6E-09					0.0004	
Medium Total						6E-09					0.0004		
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	2E-10	--	1E-08	--	1E-08	Liver	0.000004	--	0.0003	0.0003
			Iron	--	--	--	--	--	GS	0.00002	--	0.000008	0.00003
			Manganese	--	--	--	--	--	CNS	0.00002	--	0.0002	0.0002
			Chemical Total	2E-10	--	1E-08	--	1E-08		0.00005	--	0.0005	0.0005
			Exposure Point Total					1E-08					0.0005
		Exposure Medium Total					1E-08					0.0005	
Medium Total						1E-08					0.0005		
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS	0.0003	--	--	0.0003
			Arsenic	4E-08	--	1E-09	--	4E-08	Skin, CVS	0.0006	--	0.00002	0.0006
			Iron	--	--	--	--	--	GS	0.0002	--	--	0.0002
			Vanadium	--	--	--	--	--	Kidney	0.0004	--	--	0.0004
			Chemical Total	4E-08	--	1E-09	--	4E-08		0.002	--	0.00002	0.002
		Exposure Point Total					4E-08					0.002	
Exposure Medium Total					4E-08					0.002			
Medium Total						4E-08					0.002		
Receptor Total						Receptor Risk Total	8E-08			Receptor HI Total	0.003		

TABLE 9.3.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Receptor Population: Industrial Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	1E-07	--	2E-08	--	1E-07	NA	--	--	--	--
			Arsenic	3E-07	--	1E-08	--	3E-07	Skin, CVS	0.005	--	0.0002	0.005
			Iron	--	--	--	--	--	GS	0.004	--	--	0.004
			Vanadium	--	--	--	--	--	Kidney	0.005	--	--	0.005
			Chemical Total	4E-07	--	3E-08	--	4E-07		0.01	--	0.0002	0.02
		Exposure Point Total					4E-07					0.02	
Exposure Medium Total						4E-07						0.02	
Medium Total												0.02	
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	1E-07	--	4E-09	--	1E-07	Skin, CVS	0.002	--	0.00007	0.002
			Iron	--	--	--	--	--	GS	0.002	--	--	0.002
			Vanadium	--	--	--	--	--	Kidney	0.003	--	--	0.003
			Chemical Total	1E-07	--	4E-09	--	1E-07		0.007	--	0.00007	0.007
			Exposure Point Total					1E-07					0.007
		Exposure Medium Total						1E-07					
Medium Total												0.007	
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	2E-10	--	1E-08	--	1E-08	Liver	0.000004	--	0.0003	0.0003
			Iron	--	--	--	--	--	GS	0.00002	--	0.000008	0.00003
			Manganese	--	--	--	--	--	CNS	0.00002	--	0.0002	0.0002
			Chemical Total	2E-10	--	1E-08	--	1E-08		0.00005	--	0.0005	0.0005
			Exposure Point Total					1E-08					0.0005
		Exposure Medium Total						1E-08					
Medium Total												0.0005	
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS	0.0001	--	--	0.0001
			Arsenic	2E-08	--	1E-09	--	2E-08	Skin, CVS	0.0003	--	0.00002	0.0003
			Iron	--	--	--	--	--	GS	0.0001	--	--	0.0001
			Vanadium	--	--	--	--	--	Kidney	0.0002	--	--	0.0002
			Chemical Total	2E-08	--	1E-09	--	2E-08		0.0008	--	0.00002	0.0008
		Exposure Point Total					2E-08					0.0008	
Exposure Medium Total						2E-08						0.0008	
Medium Total												0.0008	
Receptor Total				Receptor Risk Total				6E-07		Receptor HI Total		0.02	

TABLE 9.4.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Receptor Population: Trespassers
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	4E-08	--	5E-09	--	5E-08	NA	--	--	--	--
			Arsenic	4E-08	--	3E-09	--	4E-08	Skin, CVS	0.0006	--	0.00004	0.0006
			Iron	--	--	--	--	--	GS	0.0005	--	--	0.0005
			Vanadium	--	--	--	--	--	Kidney	0.0005	--	--	0.0005
			Chemical Total	8E-08	--	8E-09	--	9E-08		0.002	--	0.00004	0.002
		Exposure Point Total					9E-08					0.002	
	Exposure Medium Total					9E-08					0.002		
Medium Total						9E-08					0.002		
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	1E-08	--	1E-09	--	1E-08	Skin, CVS	0.0002	--	0.00001	0.0002
			Iron	--	--	--	--	--	GS	0.0002	--	--	0.0002
			Vanadium	--	--	--	--	--	Kidney	0.0003	--	--	0.0003
			Chemical Total	1E-08	--	1E-09	--	1E-08		0.0007	--	0.00001	0.0007
			Exposure Point Total					1E-08					0.0007
		Exposure Medium Total					1E-08					0.0007	
Medium Total						1E-08					0.0007		
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	2E-09	--	3E-08	--	3E-08	Liver	0.00004	--	0.0006	0.0006
			Iron	--	--	--	--	--	GS	0.0002	--	0.00001	0.0003
			Manganese	--	--	--	--	--	CNS	0.0002	--	0.0003	0.0005
			Chemical Total	2E-09	--	3E-08	--	3E-08		0.0005	--	0.0009	0.001
			Exposure Point Total					3E-08					0.001
		Exposure Medium Total					3E-08					0.001	
Medium Total						3E-08					0.001		
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS	0.0005	--	--	0.0005
			Arsenic	8E-08	--	7E-09	--	9E-08	Skin, CVS	0.001	--	0.00009	0.001
			Iron	--	--	--	--	--	GS	0.0005	--	--	0.0005
			Vanadium	--	--	--	--	--	Kidney	0.0008	--	--	0.0008
			Chemical Total	8E-08	--	7E-09	--	9E-08		0.003	--	0.00009	0.003
		Exposure Point Total					9E-08					0.003	
Exposure Medium Total					9E-08					0.003			
Medium Total						9E-08					0.003		
Receptor Total						Receptor Risk Total	2E-07			Receptor HI Total	0.007		

TABLE 9.5.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Receptor Population: Trespassers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	1E-08	--	1E-09	--	1E-08	NA Skin, CVS GS Kidney	--	--	--	--
			Arsenic	3E-08	--	1E-09	--	3E-08		0.0006	--	0.00002	0.0006
			Iron	--	--	--	--	--		0.0005	--	--	0.0005
			Vanadium	--	--	--	--	--		0.0006	--	--	0.0006
			Chemical Total	4E-08	--	2E-09	--	4E-08		0.002	--	0.00002	0.002
		Exposure Point Total						4E-08					
Exposure Medium Total							4E-08						
Medium Total													
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	9E-09	--	3E-10	--	9E-09	Skin, CVS GS Kidney	0.0002	--	0.000007	0.0002
			Iron	--	--	--	--	--		0.0002	--	--	0.0002
			Vanadium	--	--	--	--	--		0.0004	--	--	0.0004
			Chemical Total	9E-09	--	3E-10	--	9E-09		0.0008	--	0.000007	0.0008
			Exposure Point Total							9E-09			
		Exposure Medium Total							9E-09				
Medium Total													
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	4E-10	--	5E-08	--	5E-08	Liver GS CNS	0.000006	--	0.0007	0.0007
			Iron	--	--	--	--	--		0.00003	--	0.00002	0.00005
			Manganese	--	--	--	--	--		0.00002	--	0.0003	0.0004
			Chemical Total	4E-10	--	5E-08	--	5E-08		0.00006	--	0.001	0.001
			Exposure Point Total							5E-08			
		Exposure Medium Total							5E-08				
Medium Total													
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS Skin, CVS GS Kidney	0.0003	--	--	0.0003
			Arsenic	5E-08	--	7E-09	--	6E-08		0.0008	--	0.0001	0.0009
			Iron	--	--	--	--	--		0.0003	--	--	0.0003
			Vanadium	--	--	--	--	--		0.0005	--	--	0.0005
			Chemical Total	5E-08	--	7E-09	--	6E-08		0.002	--	0.0001	0.002
		Exposure Point Total						6E-08					
Exposure Medium Total							6E-08						
Medium Total													
Receptor Total				Receptor Risk Total					Receptor HI Total				
				2E-07					0.006				

TABLE 9.6.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Scenario Timeframe: Current/Future
Receptor Population: Trespassers
Receptor Age: Lifelong (Adolescent and Adult)

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	5E-08	--	6E-09	--	6E-08					
			Arsenic	7E-08	--	4E-09	--	7E-08					
			Iron	--	--	--	--	--					
			Vanadium	--	--	--	--	--					
			Chemical Total	1E-07	--	1E-08	--	1E-07					
Exposure Point Total													
Exposure Medium Total													
Medium Total													
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	2E-08	--	1E-09	--	2E-08					
			Iron	--	--	--	--	--					
			Vanadium	--	--	--	--	--					
			Chemical Total	2E-08	--	1E-09	--	2E-08					
			Exposure Point Total										
Exposure Medium Total													
Medium Total													
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	2E-09	--	8E-08	--	8E-08					
			Iron	--	--	--	--	--					
			Manganese	--	--	--	--	--					
			Chemical Total	2E-09	--	8E-08	--	8E-08					
			Exposure Point Total										
Exposure Medium Total													
Medium Total													
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--					
			Arsenic	1E-07	--	1E-08	--	2E-07					
			Iron	--	--	--	--	--					
			Vanadium	--	--	--	--	--					
			Chemical Total	1E-07	--	1E-08	--	2E-07					
Exposure Point Total													
Exposure Medium Total													
Medium Total													
Receptor Total				Receptor Risk Total					4E-07				

TABLE 9.7.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 1 OF 3

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	2E-07	--	3E-08	--	3E-07	NA	--	--	--	--
			Arsenic	7E-07	--	2E-08	--	7E-07	Skin, CVS	0.05	--	0.002	0.05
			Iron	--	--	--	--	--	GS	0.04	--	--	0.04
			Vanadium	--	--	--	--	--	Kidney	0.05	--	--	0.05
			Chemical Total	9E-07	--	6E-08	--	1E-06		0.1	--	0.002	0.1
		Exposure Point Total					1E-06					0.1	
	Exposure Medium Total					1E-06					0.1		
Medium Total						1E-06					0.1		
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	2E-07	--	7E-09	--	2E-07	Skin, CVS	0.02	--	0.0006	0.02
			Iron	--	--	--	--	--	GS	0.02	--	--	0.02
			Vanadium	--	--	--	--	--	Kidney	0.03	--	--	0.03
			Chemical Total	2E-07	--	7E-09	--	2E-07		0.07	--	0.0006	0.07
		Exposure Point Total					2E-07					0.07	
	Exposure Medium Total					2E-07					0.07		
Medium Total						2E-07					0.07		
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--	Kidney	0.006	--	0.006	0.01
			1,2-Dichloroethane	2E-07	--	5E-09	--	2E-07	None Reported	--	--	--	--
			Benzene	1E-07	--	1E-08	--	1E-07	Blood	0.02	--	0.002	0.02
			cis-1,2-Dichloroethene	--	--	--	--	--	Blood	0.4	--	0.03	0.4
			Methylene Chloride	2E-08	--	4E-10	--	2E-08	Liver	0.001	--	0.00003	0.001
			trans-1,2-Dichloroethene	--	--	--	--	--	Blood	0.02	--	0.001	0.02
			Trichloroethene	1E-07	--	2E-08	--	2E-07	Liver	0.0007	--	0.00009	0.0008
			Vinyl Chloride	2E-05	--	8E-07	--	2E-05	Liver	0.2	--	0.006	0.2
			Aluminum	--	--	--	--	--	CNS	0.02	--	0.00006	0.02
			Arsenic	1E-05	--	3E-08	--	1E-05	Skin, CVS	1	--	0.003	1
			Chromium	--	--	--	--	--	Fetotoxicity, GS, Bone	0.03	--	0.006	0.04
			Iron	--	--	--	--	--	GS	0.6	--	0.002	0.6
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.2	--	0.01	0.2
			Vanadium	--	--	--	--	--	Kidney	0.2	--	0.01	0.2
			Chemical Total	3E-05	--	8E-07	--	4E-05		3	--	0.08	3
				Exposure Point Total					4E-05				
	Exposure Medium Total					4E-05					3		

TABLE 9.7.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 2 OF 3

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--	NA	--	0.006	--	0.006	
			1,2-Dichloroethane	--	2E-07	--	--	2E-07	NA	--	--	--	--	--
			Benzene	--	1E-07	--	--	1E-07	Blood	--	0.02	--	--	0.02
			cis-1,2-Dichloroethene	--	--	--	--	--	Blood	--	0.4	--	--	0.4
			Methylene Chloride	--	2E-08	--	--	2E-08	Liver	--	0.001	--	--	0.001
			trans-1,2-Dichloroethene	--	--	--	--	--	Blood	--	0.02	--	--	0.02
			Trichloroethene	--	1E-07	--	--	1E-07	NA	--	0.0007	--	--	0.0007
			Vinyl Chloride	--	2E-05	--	--	2E-05	Liver	--	0.2	--	--	0.2
			Aluminum	--	--	--	--	--	CNS	--	--	--	--	--
			Arsenic	--	--	--	--	--	NA	--	--	--	--	--
			Chromium	--	--	--	--	--	Lungs	--	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	--	--	--	--
			Vanadium	--	--	--	--	--	NA	--	--	--	--	--
			Chemical Total	--	2E-05	--	--	2E-05		--	0.6	--	0.6	
		Exposure Point Total						2E-05					0.6	
	Exposure Medium Total							2E-05					0.6	
Medium Total								6E-05					3	
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	1E-09	--	1E-08	--	1E-08	Liver	0.0001	--	0.002	0.002	
			Iron	--	--	--	--	--	GS	0.0007	--	0.00004	0.0008	
			Manganese	--	--	--	--	--	CNS	0.0006	--	0.0008	0.001	
			Chemical Total	1E-09	--	1E-08	--	1E-08		0.001	--	0.002	0.004	
			Exposure Point Total						1E-08				0.004	
Exposure Medium Total						1E-08				0.004				
Medium Total								1E-08				0.004		
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS	0.003	--	--	0.003	
			Arsenic	9E-08	--	3E-09	--	9E-08	Skin, CVS	0.007	--	0.0002	0.007	
			Iron	--	--	--	--	--	GS	0.003	--	--	0.003	
			Vanadium	--	--	--	--	--	Kidney	0.005	--	--	0.005	
			Chemical Total	9E-08	--	3E-09	--	9E-08		0.02	--	0.0002	0.02	
Exposure Point Total						9E-08				0.02				
Exposure Medium Total						9E-08				0.02				
Medium Total								9E-08				0.02		
Receptor Total								6E-05				Receptor HI Total	4	

TABLE 9.7.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 3 OF 3

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

Note:

Inhalation exposures are assumed to be equal to the exposures from ingestion of groundwater.

Total Blood HI	0.8
Total CNS HI	0.2
Total CVS HI	1
Total GS HI	0.7
Total Kidney HI	0.3
Total Liver HI	0.3
Total Skin HI	1

TABLE 9.8.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 1 OF 3

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	9E-08	--	1E-08	--	1E-07	NA	--	--	--	--
			Arsenic	3E-07	--	9E-09	--	3E-07	Skin, CVS	0.006	--	0.0002	0.006
			Iron	--	--	--	--	--	GS	0.005	--	--	0.005
			Vanadium	--	--	--	--	--	Kidney	0.005	--	--	0.005
			Chemical Total	3E-07	--	2E-08	--	4E-07		0.02	--	0.0002	0.02
		Exposure Point Total					4E-07					0.02	
Exposure Medium Total						4E-07					0.02		
Medium Total						4E-07					0.02		
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	8E-08	--	3E-09	--	8E-08	Skin, CVS	0.002	--	0.00006	0.002
			Iron	--	--	--	--	--	GS	0.002	--	--	0.002
			Vanadium	--	--	--	--	--	Kidney	0.003	--	--	0.003
			Chemical Total	8E-08	--	3E-09	--	8E-08		0.007	--	0.00006	0.007
		Exposure Point Total					8E-08					0.007	
Exposure Medium Total						8E-08					0.007		
Medium Total						8E-08					0.007		
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--	Kidney	0.003	--	0.004	0.006
			1,2-Dichloroethane	2E-07	--	1E-08	--	3E-07	None Reported	--	--	--	--
			Benzene	2E-07	--	2E-08	--	2E-07	Blood	0.007	--	0.001	0.008
			cis-1,2-Dichloroethene	--	--	--	--	--	Blood	0.2	--	0.02	0.2
			Methylene Chloride	2E-08	--	9E-10	--	3E-08	Liver	0.0006	--	0.00002	0.0006
			trans-1,2-Dichloroethene	--	--	--	--	--	Blood	0.007	--	0.0006	0.008
			Trichloroethene	2E-07	--	3E-08	--	2E-07	Liver	0.0003	--	0.00005	0.0004
			Vinyl Chloride	3E-05	--	2E-06	--	3E-05	Liver	0.07	--	0.004	0.08
			Aluminum	--	--	--	--	--	CNS	0.01	--	0.00003	0.01
			Arsenic	2E-05	--	7E-08	--	2E-05	Skin, CVS	0.5	--	0.002	0.5
			Chromium	--	--	--	--	--	Fetotoxicity, GS, Bone	0.01	--	0.004	0.02
			Iron	--	--	--	--	--	GS	0.3	--	0.0009	0.3
			Lead	--	--	--	--	--	NA	--	--	--	--
			Manganese	--	--	--	--	--	CNS	0.07	--	0.006	0.08
			Vanadium	--	--	--	--	--	Kidney	0.07	--	0.008	0.08
			Chemical Total	6E-05	--	2E-06	--	6E-05		1	--	0.05	1
		Exposure Point Total						6E-05					1
Exposure Medium Total						6E-05					1		

TABLE 9.8.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 2 OF 3

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient					
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total	
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--	NA	--	0.003	--	0.003	
			1,2-Dichloroethane	--	2E-07	--	--	2E-07	NA	--	--	--	--	--
			Benzene	--	2E-07	--	--	2E-07	Blood	--	0.007	--	0.007	0.007
			cis-1,2-Dichloroethene	--	--	--	--	--	Blood	--	0.2	--	0.2	0.2
			Methylene Chloride	--	2E-08	--	--	2E-08	Liver	--	0.0006	--	0.0006	0.0006
			trans-1,2-Dichloroethene	--	--	--	--	--	Blood	--	0.007	--	0.007	0.007
			Trichloroethene	--	2E-07	--	--	2E-07	NA	--	0.0003	--	0.0003	0.0003
			Vinyl Chloride	--	3E-05	--	--	3E-05	Liver	--	0.07	--	0.07	0.07
			Aluminum	--	--	--	--	--	CNS	--	--	--	--	--
			Arsenic	--	--	--	--	--	NA	--	--	--	--	--
			Chromium	--	--	--	--	--	Lungs	--	--	--	--	--
			Iron	--	--	--	--	--	NA	--	--	--	--	--
			Lead	--	--	--	--	--	NA	--	--	--	--	--
			Manganese	--	--	--	--	--	CNS	--	--	--	--	--
Vanadium	--	--	--	--	--	NA	--	--	--	--	--			
			Chemical Total	--	3E-05	--	--	3E-05		--	0.3	--	0.3	
		Exposure Point Total						3E-05					0.3	
	Exposure Medium Total							3E-05					0.3	
Medium Total								9E-05					2	
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	2E-10	--	2E-08	--	2E-08	Liver	0.000006	--	0.0007	0.0007	
			Iron	--	--	--	--	--	GS	0.00003	--	0.00002	0.00005	
			Manganese	--	--	--	--	--	CNS	0.00002	--	0.0003	0.0004	
			Chemical Total	2E-10	--	2E-08	--	2E-08		0.00006	--	0.001	0.001	
			Exposure Point Total						2E-08					0.001
Exposure Medium Total							2E-08					0.001		
Medium Total								2E-08					0.001	
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--	CNS	0.0003	--	--	0.0003	
			Arsenic	3E-08	--	1E-09	--	4E-08	Skin, CVS	0.0008	--	0.00003	0.0008	
			Iron	--	--	--	--	--	GS	0.0003	--	--	0.0003	
			Vanadium	--	--	--	--	--	Kidney	0.0005	--	--	0.0005	
			Chemical Total	3E-08	--	1E-09	--	4E-08		0.002	--	0.00003	0.002	
			Exposure Point Total						4E-08					0.002
Exposure Medium Total							4E-08					0.002		
Medium Total								4E-08					0.002	
Receptor Total								9E-05					2	

TABLE 9.8.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCS
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 3 OF 3

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total

Note:
Inhalation exposures are assumed to be equal to the exposures from ingestion of groundwater.

Total Blood HI	0.4
Total CNS HI	0.09
Total CVS HI	0.5
Total GS HI	0.3
Total Kidney HI	0.09
Total Liver HI	0.2
Total Skin HI	0.5

TABLE 9.9.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 1 OF 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Lifelong (Child and Adult)

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Surface Soil	Site 3	Benzo(a)pyrene Equivalents	3E-07	--	5E-08	--	4E-07					
			Arsenic	9E-07	--	3E-08	--	1E-06					
			Iron	--	--	--	--	--					
			Vanadium	--	--	--	--	--					
			Chemical Total	1E-06	--	8E-08	--	1E-06					
Exposure Point Total													
Exposure Medium Total													
Medium Total													
Subsurface Soil	Subsurface Soil	Site 3	Arsenic	3E-07	--	1E-08	--	3E-07					
			Iron	--	--	--	--	--					
			Vanadium	--	--	--	--	--					
			Chemical Total	3E-07	--	1E-08	--	3E-07					
			Exposure Point Total										
Exposure Medium Total													
Medium Total													
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--					
			1,2-Dichloroethane	4E-07	--	2E-08	--	4E-07					
			Benzene	3E-07	--	3E-08	--	3E-07					
			cis-1,2-Dichloroethene	--	--	--	--	--					
			Methylene Chloride	4E-08	--	1E-09	--	4E-08					
			trans-1,2-Dichloroethene	--	--	--	--	--					
			Trichloroethene	3E-07	--	5E-08	--	4E-07					
			Vinyl Chloride	5E-05	--	2E-06	--	6E-05					
			Aluminum	--	--	--	--	--					
			Arsenic	4E-05	--	1E-07	--	4E-05					
			Chromium	--	--	--	--	--					
			Iron	--	--	--	--	--					
			Lead	--	--	--	--	--					
			Manganese	--	--	--	--	--					
			Vanadium	--	--	--	--	--					
			Chemical Total	9E-05	--	3E-06	--	9E-05					
			Exposure Point Total										
Exposure Medium Total													

TABLE 9.9.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURES
NCBC GULFPORT, GULFPORT, MISSISSIPPI
PAGE 2 OF 2

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Lifelong (Child and Adult)

Medium	Exposure Medium	Exposure Point	Chemical of Potential Concern	Carcinogenic Risk					Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	External (Radiation)	Exposure Routes Total	Primary Target Organ(s)	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater	Site 3	1,2,4-Trichlorobenzene	--	--	--	--	--					
			1,2-Dichloroethane	--	4E-07	--	--	4E-07					
			Benzene	--	3E-07	--	--	3E-07					
			cis-1,2-Dichloroethene	--	--	--	--	--					
			Methylene Chloride	--	4E-08	--	--	4E-08					
			trans-1,2-Dichloroethene	--	--	--	--	--					
			Trichloroethene	--	3E-07	--	--	3E-07					
			Vinyl Chloride	--	5E-05	--	--	5E-05					
			Aluminum	--	--	--	--	--					
			Arsenic	--	--	--	--	--					
			Chromium	--	--	--	--	--					
			Iron	--	--	--	--	--					
			Lead	--	--	--	--	--					
			Manganese	--	--	--	--	--					
Vanadium	--	--	--	--	--								
			Chemical Total	--	5E-05	--	--	5E-05					
		Exposure Point Total						5E-05					
	Exposure Medium Total							5E-05					
Medium Total								1E-04					
Surface Water	Surface Water	Site 3	Bis(2-ethylhexyl)phthalate	1E-09	--	3E-08	--	3E-08					
			Iron	--	--	--	--	--					
			Manganese	--	--	--	--	--					
			Chemical Total	1E-09	--	3E-08	--	3E-08					
		Exposure Point Total						3E-08					
	Exposure Medium Total							3E-08					
Medium Total								3E-08					
Sediment	Sediment	Site 3	Aluminum	--	--	--	--	--					
			Arsenic	1E-07	--	4E-09	--	1E-07					
			Iron	--	--	--	--	--					
			Vanadium	--	--	--	--	--					
			Chemical Total	1E-07	--	4E-09	--	1E-07					
		Exposure Point Total						1E-07					
	Exposure Medium Total							1E-07					
Medium Total								1E-07					
Receptor Total								1E-04					

Note:
Inhalation exposures are assumed to be equal to the exposures from ingestion of groundwater.

APPENDIX D.2

SAMPLE CALCULATIONS

CALCULATION WORKSHEET

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL FUTURE ON-SITE CHILD RESIDENT		
BASED ON: USEPA, DEC. 1989		
BY: R. JUPIN	CHECKED BY: <i>T. Johnson</i>	DATE: 01/04/2008

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from incidental ingestion of surface soil soil.

EQUATION:
$$IEX = \frac{CS \times IR \times EF \times ED \times FI \times CF}{BW \times AT}$$

Where:

- IEX = estimated exposure intake (mg/kg/day)
- Cs = exposure point concentration in soil (mg/kg)
- IR = incidental ingestion rate (mg/day)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- FI = fraction ingested from contaminated source (unitless)
- CF = conversion factor (1.0E-6 kg/mg)
- BW = body weight (kg)
- AT = averaging time (days)
- CSFo = oral carcinogenic slope factor ((mg/kg/day)⁻¹)
- RfDo = oral noncarcinogenic reference dose (mg/kg/day)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)⁻¹
 HQ (Noncarcinogens) = Intake (mg/kg/day) / RfDo (mg/kg/day)

ASSUMPTIONS:

- Cs = 3.66 mg/kg Chemical: Arsenic
- IR = 200 mg/day
- EF = 350 days/year
- ED = 6 years
- FI = 1
- CF = 1.0E-06 kg/mg
- BW = 15 kg
- ATc = 25550 days
- ATnc = 2190 days
- CSFo = 1.5E+00 (mg/kg/day)⁻¹
- RfDo = 3.0E-04 (mg/kg/day)

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL FUTURE ON-SITE CHILD RESIDENT		
BASED ON: USEPA, DEC. 1989		
BY: R. JUPIN	CHECKED BY: 	DATE: 01/04/2008

EXAMPLE CARCINOGENIC CALCULATION

$$IEX_c = \frac{3.66 \text{ mg/kg} \times 200 \text{ mg/day} \times 350 \text{ days/year} \times 6 \text{ years} \times 1 \times 1.0E-06 \text{ kg/mg}}{15 \text{ kg} \times 25550 \text{ days}}$$

$$IEX_c = 4.01E-06 \text{ mg/kg/day} \quad \checkmark$$

$$ILCR = 4.01E-06 \text{ mg/kg/day} \times 1.50E+00 \text{ (mg/kg/day)}^{-1} = \text{Incremental Lifetime Cancer Risk}$$

$$ILCR = 6.02E-06 \quad \checkmark$$

EXAMPLE NONCARCINOGENIC CALCULATION

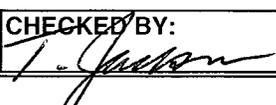
$$IEX_{nc} = \frac{3.66 \text{ mg/kg} \times 200 \text{ mg/day} \times 350 \text{ days/year} \times 6 \text{ years} \times 1 \times 1.0E-06 \text{ kg/mg}}{15 \text{ kg} \times 2190 \text{ days}}$$

$$IEX_{nc} = 4.68E-05 \text{ mg/kg/day} \quad \checkmark$$

$$HQ = 4.68E-05 \text{ mg/kg/day} / 3.00E-04 \text{ (mg/kg/day)} = \text{Hazard Quotient}$$

$$HQ = 1.56E-01 \quad \checkmark$$

CALCULATION WORKSHEET

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL FUTURE ON-SITE CHILD RESIDENT		
BASED ON: USEPA, DEC. 2001		
BY: R. JUPIN	CHECKED BY: 	DATE: 01/04/2008

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from dermal contact with surface soil.

EQUATION:
$$DEX = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

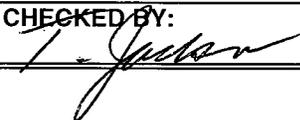
- DEX = estimated exposure intake (mg/kg/day)
- Cs = exposure point concentration in soil (mg/kg)
- CF = conversion factor (1.0E-6 kg/mg)
- SA = skin surface available for contact (cm²/day)
- ABS = absorption factor (unitless)
- AF = adherence factor (mg/cm²)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- BW = body weight (kg)
- AT = averaging time (days)
- CSFd = dermal carcinogenic slope factor ((mg/kg/day)⁻¹)
- RfDd = dermal noncarcinogenic reference dose (mg/kg/day)

RISKS:

- ILCR (Carcinogens) = Intake (mg/kg/day) x CSFd (mg/kg/day)⁻¹
- HQ (Noncarcinogens) = Intake (mg/kg/day) / RfDd (mg/kg/day)

ASSUMPTIONS:

- Cs = 3.66 mg/kg Chemical: Arsenic
- CF = 1.0E-06 kg/mg
- SA = 2800 cm²/day
- AF = 0.2 mg/cm²
- ABS = 0.03
- EF = 350 days/year
- ED = 6 years
- BW = 15 kg
- ATc = 25550 days
- ATnc = 2190 days
- CSFd = 1.5E+00 (mg/kg/day)⁻¹
- RfDd = 3.0E-04 (mg/kg/day)

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL FUTURE ON-SITE CHILD RESIDENT		
BASED ON: USEPA, DEC. 2001		
BY: R. JUPIN	CHECKED BY: 	DATE: 01/04/2008

EXAMPLE CARCINOGENIC CALCULATION

$$\text{DEXc} = \frac{3.66 \text{ mg/kg} \times 1.0\text{E-}06 \text{ kg/mg} \times 2800 \text{ cm}^2/\text{day} \times 0.2 \text{ mg/cm}^2 \times 0.03 \times 350 \text{ days/year} \times 6 \text{ years}}{15 \text{ kg} \times 25550 \text{ days}}$$

DEXc = 3.37E-07 mg/kg/day ✓

ILCR = 3.37E-07 mg/kg/day x 1.50E+00 (mg/kg/day)⁻¹ = Incremental Lifetime Cancer Risk

ILCR = 5.05E-07 ✓

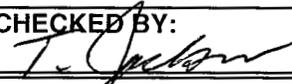
EXAMPLE NONCARCINOGENIC CALCULATION

$$\text{DEXnc} = \frac{3.66 \text{ mg/kg} \times 1.0\text{E-}06 \text{ kg/mg} \times 2800 \text{ cm}^2/\text{day} \times 0.2 \text{ mg/cm}^2 \times 0.03 \times 350 \text{ days/year} \times 6 \text{ years}}{15 \text{ kg} \times 2190 \text{ days}}$$

DEXnc = 3.93E-06 mg/kg/day ✓

HQ = 3.93E-06 mg/kg/day / 3.00E-04 (mg/kg/day) = Hazard Quotient

HQ = 1.31E-02 ✓

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL FOR MUTAGENIC CHEMICALS - HYPOTHETICAL CHILD RESIDENTS		
BASED ON: U.S. EPA, DECEMBER 1989		
BY: R. JUPIN	CHECKED BY: 	DATE: 1/17/2008

PURPOSE: To estimate intake and cancer risks for mutagenic chemicals from incidental ingestion of surface/subsurface soil at Zone 1.

EQUATION:
$$IEX = \frac{CS \times IR \times EF \times ED \times FI \times CF}{BW \times AT} \times ADAF$$

Where:

- IEX = estimated exposure intake (mg/kg/day)
- Cs = exposure point concentration in soil (mg/kg)
- IR = incidental ingestion rate (mg/day)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- FI = fraction ingested from contaminated source (unitless)
- CF = conversion factor (1.0E-6 kg/mg)
- BW = body weight (kg)
- AT = averaging time (days)
- ADAF = age-dependent adjustment factor
- CSFo = oral carcinogenic slope factor ((mg/kg/day)⁻¹)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)⁻¹

ASSUMPTIONS:

- Cs = 0.265 mg/kg Chemical: Benzo(a)pyrene Equivalents
- IR = 200 mg/day
- EF = 350 days/year
- ED₁ = 2 years
- ED₂ = 4 years
- FI = 1
- CF = 1.0E-06 kg/mg
- BW = 15 kg
- AT = 25550 days
- CSFo = 7.3E+00 (mg/kg/day)⁻¹
- ADAF₁ = 10
- ADAF₂ = 3

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL FOR MUTAGENIC CHEMICALS - HYPOTHETICAL CHILD RESIDENTS		
BASED ON: U.S. EPA, DECEMBER 1989		
BY: R. JUPIN	CHECKED BY: <i>R. Jupin</i>	DATE: 1/17/2008

EXAMPLE CARCINOGENIC CALCULATION

$$IEX_1 = \frac{0.265 \text{ mg/kg} \times 200 \text{ mg/day} \times 350 \text{ days/year} \times 2 \text{ years} \times 1 \times 1.0E-06 \text{ kg/mg}}{15 \text{ kg} \times 25550 \text{ days}} \times 10$$

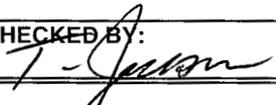
$$IEX_1 = 9.68E-07 \text{ mg/kg/day}$$

$$IEX_2 = \frac{0.265 \text{ mg/kg} \times 200 \text{ mg/day} \times 350 \text{ days/year} \times 4 \text{ years} \times 1 \times 1.0E-06 \text{ kg/mg}}{15 \text{ kg} \times 25550 \text{ days}} \times 3$$

$$IEX_2 = 5.81E-07 \text{ mg/kg/day}$$

$$ILCR = (9.68E-07 \text{ mg/kg/day} + 5.81E-07 \text{ mg/kg/day}) \times 7.30E+00 \text{ (mg/kg/day)}^{-1}$$

$$ILCR = 1.1E-05$$

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL FOR MUTAGENIC CHEMICALS HYPOTHETICAL CHILD RESIDENTS		
BASED ON: U.S. EPA, JULY 2004		
BY: R. JUPIN	CHECKED BY: 	DATE: 1/17/2008

PURPOSE: To estimate intake and cancer risks for mutagenic chemicals from dermal contact with surface/subsurface soil at Zone 1.

EQUATION:
$$DEX = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT} \times ADAF$$

Where:

- DEX = estimated exposure intake (mg/kg/day)
- Cs = exposure point concentration in soil (mg/kg)
- CF = conversion factor (1.0E-6 kg/mg)
- SA = skin surface available for contact (cm²/day)
- ABS = absorption factor (unitless)
- AF = adherence factor (mg/cm²)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- BW = body weight (kg)
- AT = averaging time (days)
- ADAF = age-dependent adjustment factor
- CSFd = dermal carcinogenic slope factor ((mg/kg/day)⁻¹)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFd (mg/kg/day)⁻¹

ASSUMPTIONS:

- Cs = 0.265 mg/kg Chemical: Benzo(a)pyrene Equivalents
- CF = 1.0E-06 kg/mg
- SA = 2800 cm²/day
- AF = 0.2 mg/cm²
- ABS = 0.13
- EF = 350 days/year
- ED₁ = 2 years
- ED₂ = 4 years
- BW = 15 kg
- AT = 25550 days
- CSFd = 7.3E+00 (mg/kg/day)⁻¹
- ADAF₁ = 10
- ADAF₂ = 3

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL FOR MUTAGENIC CHEMICALS HYPOTHETICAL CHILD RESIDENTS		
BASED ON: U.S. EPA, JULY 2004		
BY: R. JUPIN	CHECKED BY: <i>[Signature]</i>	DATE: 1/17/2008

EXAMPLE CARCINOGENIC CALCULATION

$$DEXc = \frac{0.265 \text{ mg/kg} \times 1.0E-06 \text{ kg/mg} \times 2800 \text{ cm}^2/\text{day} \times 0.2 \text{ mg/cm}^2 \times 0.13 \times 350 \text{ days/year} \times 2 \text{ years}}{15 \text{ kg} \times 25550 \text{ days}} \times 10$$

$$DEXc = 3.52E-07 \text{ mg/kg/day} \quad \checkmark$$

$$DEXc = \frac{0.265 \text{ mg/kg} \times 1.0E-06 \text{ kg/mg} \times 2800 \text{ cm}^2/\text{day} \times 0.2 \text{ mg/cm}^2 \times 0.13 \times 350 \text{ days/year} \times 4 \text{ years}}{15 \text{ kg} \times 25550 \text{ days}} \times 3$$

$$DEXc = 2.11E-07 \text{ mg/kg/day} \quad \checkmark$$

$$ILCR = (3.52E-07 \text{ mg/kg/day} + 2.11E-07 \text{ mg/kg/day}) \times 7.30E+00 \text{ (mg/kg/day)}^{-1}$$

$$ILCR = 4.1E-06 \quad \checkmark$$

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL FOR MUTAGENIC CHEMICALS - HYPOTHETICAL ADULT RESIDENTS		
BASED ON: U.S. EPA, DECEMBER 1989		
BY: R. JUPIN	CHECKED BY: 	DATE: 1/17/2008

PURPOSE: To estimate intake and cancer risks for mutagenic chemicals from incidental ingestion of surface/subsurface soil at Zone 1.

EQUATION:
$$IEX = \frac{CS \times IR \times EF \times ED \times FI \times CF}{BW \times AT} \times ADAF$$

Where:

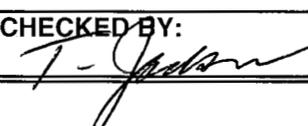
- IEX = estimated exposure intake (mg/kg/day)
- Cs = exposure point concentration in soil (mg/kg)
- IR = incidental ingestion rate (mg/day)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- FI = fraction ingested from contaminated source (unitless)
- CF = conversion factor (1.0E-6 kg/mg)
- BW = body weight (kg)
- AT = averaging time (days)
- ADAF = age-dependent adjustment factor
- CSFo = oral carcinogenic slope factor ((mg/kg/day)⁻¹)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)⁻¹

ASSUMPTIONS:

- Cs = 0.265 mg/kg Chemical: Benzo(a)pyrene Equivalents
- IR = 100 mg/day
- EF = 350 days/year
- ED₁ = 10 years
- ED₂ = 14 years
- FI = 1
- CF = 1.0E-06 kg/mg
- BW = 70 kg
- AT = 25550 days
- CSFo = 7.3E+00 (mg/kg/day)⁻¹
- ADAF₁ = 3
- ADAF₂ = 1

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SOIL FOR MUTAGENIC CHEMICALS - HYPOTHETICAL ADULT RESIDENTS		
BASED ON: U.S. EPA, DECEMBER 1989		
BY: R. JUPIN	CHECKED BY: 	DATE: 1/17/2008

EXAMPLE CARCINOGENIC CALCULATION

$$IEX_1 = \frac{0.265 \text{ mg/kg} \times 100 \text{ mg/day} \times 350 \text{ days/year} \times 10 \text{ years} \times 1 \times 1.0E-06 \text{ kg/mg}}{70 \text{ kg} \times 25550 \text{ days}} \times 3$$

$$IEX_1 = 1.56E-07 \text{ mg/kg/day} \quad \checkmark$$

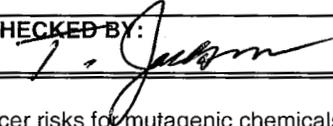
$$IEX_2 = \frac{0.265 \text{ mg/kg} \times 100 \text{ mg/day} \times 350 \text{ days/year} \times 14 \text{ years} \times 1 \times 1.0E-06 \text{ kg/mg}}{70 \text{ kg} \times 25550 \text{ days}} \times 1$$

$$IEX_2 = 7.26E-08 \text{ mg/kg/day} \quad \checkmark$$

$$ILCR = (1.56E-07 \text{ mg/kg/day} + 7.26E-08 \text{ mg/kg/day}) \times 7.30E+00 \text{ (mg/kg/day)}^{-1}$$

$$ILCR = 1.7E-06 \quad \checkmark$$

CALCULATION WORKSHEET

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL FOR MUTAGENIC CHEMICALS HYPOTHETICAL ADULT RESIDENTS		
BASED ON: U.S. EPA, JULY 2004		
BY: R. JUPIN	CHECKED BY: 	DATE: 1/17/2008

PURPOSE: To estimate intake and cancer risks for mutagenic chemicals from dermal contact with surface/subsurface soil at Zone 1.

EQUATION:
$$DEX = \frac{Cs \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT} \times ADAF$$

Where:

- DEX = estimated exposure intake (mg/kg/day)
- Cs = exposure point concentration in soil (mg/kg)
- CF = conversion factor (1.0E-6 kg/mg)
- SA = skin surface available for contact (cm²/day)
- ABS = absorption factor (unitless)
- AF = adherence factor (mg/cm²)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- BW = body weight (kg)
- AT = averaging time (days)
- ADAF = age-dependent adjustment factor
- CSFd = dermal carcinogenic slope factor ((mg/kg/day)⁻¹)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFd (mg/kg/day)⁻¹

ASSUMPTIONS:

- Cs = 0.265 mg/kg Chemical: Benzo(a)pyrene Equivalents
- CF = 1.0E-06 kg/mg
- SA = 5700 cm²/day
- AF = 0.07 mg/cm²
- ABS = 0.13
- EF = 350 days/year
- ED₁ = 10 years
- ED₂ = 14 years
- BW = 70 kg
- AT = 25550 days
- CSFd = 7.3E+00 (mg/kg/day)⁻¹
- ADAF₁ = 3
- ADAF₂ = 1

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SOIL FOR MUTAGENIC CHEMICALS HYPOTHETICAL ADULT RESIDENTS		
BASED ON: U.S. EPA, JULY 2004		
BY: R. JUPIN	CHECKED BY: 	DATE: 1/17/2008

EXAMPLE CARCINOGENIC CALCULATION

$$\text{DEXc} = \frac{0.265 \text{ mg/kg} \times 1.0\text{E-}06 \text{ kg/mg} \times 5700 \text{ cm}^2/\text{day} \times 0.07 \text{ mg/cm}^2 \times 0.13 \times 350 \text{ days/year} \times 10 \text{ years}}{70 \text{ kg} \times 25550 \text{ days}} \times 3$$

$$\text{DEXc} = 8.07\text{E-}08 \text{ mg/kg/day} \quad \checkmark$$

$$\text{DEXc} = \frac{0.265 \text{ mg/kg} \times 1.0\text{E-}06 \text{ kg/mg} \times 5700 \text{ cm}^2/\text{day} \times 0.07 \text{ mg/cm}^2 \times 0.13 \times 350 \text{ days/year} \times 14 \text{ years}}{70 \text{ kg} \times 25550 \text{ days}} \times 1$$

$$\text{DEXc} = 3.77\text{E-}08 \text{ mg/kg/day} \quad \checkmark$$

$$\text{ILCR} = (8.07\text{E-}08 \text{ mg/kg/day} + 3.77\text{E-}08 \text{ mg/kg/day}) \times 7.30\text{E+}00 \text{ (mg/kg/day)}^{-1}$$

$$\text{ILCR} = 8.6\text{E-}07 \quad \checkmark$$

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INGESTION OF GROUNDWATER ADULT RESIDENT		
BASED ON: USEPA, DEC. 1989		
BY: R. JUPIN	CHECKED BY: <i>[Signature]</i>	DATE: 01/04/2008

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from ingestion of groundwater by an adult resident.

EQUATION:
$$IEX = \frac{C_{gw} \times CF \times IF \times EF \times ED}{BW \times AT}$$

Where:

- IEX = estimated exposure intake (mg/kg/day)
- C_{gw} = exposure point concentration in groundwater (ug/L)
- CF = conversion factor (1.0E-3 mg/ug)
- IR = ingestion rate (L/day)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- BW = body weight (kg)
- AT = averaging time (days)
- CSFo = oral carcinogenic slope factor ((mg/kg/day)⁻¹)
- RfDo = oral noncarcinogenic reference dose (mg/kg/day)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)⁻¹
 HQ (Noncarcinogens) = Intake (mg/kg/day) / RfDo (mg/kg/day)

ASSUMPTIONS:

- C_{gw} = 17.1 ug/L Chemical: Vinyl Chloride
- IR = 2 L/day
- CF = 1.0E-03 mg/ug
- EF = 350 days/year
- ED = 24 years
- BW = 70 kg
- AT_c = 25550 days
- AT_{nc} = 8760 days
- CSFo = 1.5E+00 (mg/kg/day)⁻¹
- RfDo = 3.0E-03 (mg/kg/day)

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INGESTION OF GROUNDWATER ADULT RESIDENT		
BASED ON: USEPA, DEC. 1989		
BY: R. JUPIN	CHECKED BY: <i>T. Jackson</i>	DATE: 01/04/2008

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{17.1 \text{ ug/L} \times 0.001 \text{ mg/ug} \times 2 \text{ L/day} \times 350 \text{ days/year} \times 24 \text{ years}}{70 \text{ kg} \times 25550 \text{ days}}$$

$$IEXc = 1.61E-04 \text{ mg/kg/day} \quad \checkmark$$

$$ILCR = 1.61E-04 \text{ mg/kg/day} \times 1.50E+00 \text{ (mg/kg/day)}^{-1} = \text{Incremental Lifetime Cancer Risk}$$

$$ILCR = 2.41E-04 \quad \checkmark$$

EXAMPLE NONCARCINOGENIC CALCULATION

$$IEXnc = \frac{17.1 \text{ ug/L} \times 0.001 \text{ mg/ug} \times 2 \text{ L/day} \times 350 \text{ days/year} \times 24 \text{ years}}{70 \text{ kg} \times 8760 \text{ days}}$$

$$IEXnc = 4.68E-04 \text{ mg/kg/day} \quad \checkmark$$

$$HQ = \frac{4.68E-04 \text{ mg/kg/day}}{3.00E-03 \text{ (mg/kg/day)}} = \text{Hazard Quotient}$$

$$HQ = 1.56E-01 \quad \checkmark$$

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH GROUNDWATER ADULT RESIDENT		
BASED ON: USEPA, DEC. 1989, 2004		
BY: R. JUPIN	CHECKED BY: <i>[Signature]</i>	DATE: 01/04/2008

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from dermal contact with groundwater by an adult resident.

EQUATION:
$$DAD = \frac{DA_{event} \times EV \times ED \times EF \times A}{BW \times AT}$$

Where:

- DAD = dermally absorbed dose (mg/kg/day)
- DA_{event} = absorbed does per event (mg/cm²/event)
- EV = event frequency (events/day)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- A = skin surface available for contact (cm²)
- BW = body weight (kg)
- AT = averaging time (days)
- CSFd = dermal carcinogenic slope factor ((mg/kg/day)⁻¹)
- RfDd = dermal noncarcinogenic reference dose (mg/kg/day)

RISKS:

- ILCR (Carcinogens) = DAD (mg/kg/day) x CSFd (mg/kg/day)⁻¹
- HQ (Noncarcinogens) = DAD (mg/kg/day) / RfDd (mg/kg/day)

EQUATIONS for DA_{event}:

For Inorganics:

$DA_{event} = K_p \times C_w \times CF \times t_{event}$

For Organics:

If $t_{event} \leq t'$, then: $DA_{event} = 2 \times FA \times K_p \times C_w \times CF \times \sqrt{\frac{6 \times \tau \times t_{event}}{\pi}}$

If $t_{event} > t'$, then: $DA_{event} = FA \times K_p \times C_w \times CF \times \left[\frac{t_{event}}{1+B} + 2 \times \tau \times \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]$

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH GROUNDWATER ADULT RESIDENT		
BASED ON: USEPA, DEC. 1989, 2004		
BY: R. JUPIN	CHECKED BY: <i>R. J. J. J.</i>	DATE: 01/04/2008

Where:

- Kp = permeability coefficient from water (cm/hr)
- Cgw = concentration of chemical in groundwater (mg/L)
- tevent = duration of event (hr/event)
- CF = conversion factor (0.001 L/cm³)
- t* = time it takes to reach steady-state (hr/event)
- τ = lag time (hr/event)
- B = Bunge Model Constant (dimensionless)

EXAMPLE CALCULATION OF DAevent

ASSUMPTIONS:

- Cgw = 0.0171 mg/L Chemical: Vinyl Chloride
- Kp = 5.60E-03 cm/hr
- FA = 1 unitless
- tevent = 0.33 hr/event
- CF = 0.001 L/cm³
- t* = 0.57 hr/event
- τ = 0.24 hr/event
- B = 0.017

tevent < t*, therefore,

$$DA_{event} = (2 \times 0.0056 \text{ cm/hr}) (1) (0.0171 \text{ mg/L}) (0.001 \text{ L/cm}^3) \times$$

$$\sqrt{\frac{6 \times 0.24 \text{ hr/event} \times 0.33 \text{ hr/event}}{\pi}}$$

$$DA_{event} = 7.45E-08 \text{ mg/cm}^2\text{-event}$$

RISK CALCULATIONS

ASSUMPTIONS:

- A = 18000 cm²/day
- EV = 1 event/day
- ED = 24 years
- EF = 350 days/year
- BW = 70 kg
- ATc = 25550 days
- ATnc = 8760 days
- CSFd = 1.5E+00 (mg/kg/day)⁻¹
- RfDd = 3.0E-03 (mg/kg/day)

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH GROUNDWATER ADULT RESIDENT		
BASED ON: USEPA, DEC. 1989, 2004		
BY: R. JUPIN	CHECKED BY: <i>R. Jupin</i>	DATE: 01/04/2008

EXAMPLE CARCINOGENIC CALCULATION

$$\text{DADc} = \frac{7.45\text{E-}08 \text{ mg/cm}^2\text{-event} \times 1 \text{ event/day} \times 24 \text{ years} \times 350 \text{ days/year} \times 18000 \text{ cm}^2\text{/day}}{70 \text{ kg} \times 25550 \text{ days}}$$

$$\text{DADc} = 6.30\text{E-}06 \text{ mg/kg/day} \quad \checkmark$$

$$\text{DADc} = 6.30\text{E-}06 \text{ mg/kg/day} \times 1.50\text{E+}00 \text{ (mg/kg/day)}^{-1} = \text{Incremental Lifetime Cancer Risk}$$

$$\text{ILCR} = 9.45\text{E-}06 \quad \checkmark$$

EXAMPLE NONCARCINOGENIC CALCULATION

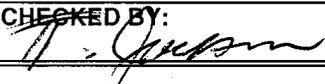
$$\text{DADnc} = \frac{7.45\text{E-}08 \text{ mg/cm}^2\text{-event} \times 1 \text{ event/day} \times 24 \text{ years} \times 350 \text{ days/year} \times 18000 \text{ cm}^2\text{/day}}{70 \text{ kg} \times 8760 \text{ days}}$$

$$\text{DADnc} = 1.84\text{E-}05 \text{ mg/kg/day} \quad \checkmark$$

$$\text{HQ} = 1.84\text{E-}05 \text{ mg/kg/day} / 3.00\text{E-}03 \text{ (mg/kg/day)} = \text{Hazard Quotient}$$

$$\text{HQ} = 6.12\text{E-}03 \quad \checkmark$$

CALCULATION WORKSHEET

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: ESTIMATION OF AMBIENT AIR CONCENTRATIONS IN A TRENCH RESULTING FROM VOLATILE EMISSIONS FROM GROUNDWATER.		
BASED ON: VDEQ, 2002		
BY: R. JUPIN	CHECKED BY: 	DATE: 01/04/2008

PURPOSE: To calculate ambient air concentrations resulting from volatilization of chemicals from groundwater.

C_{trench} = CGW x VF

Where:

C_{trench} = concentration of contaminant in the trench µg/m³
 CGW = concentration of contaminant in groundwater µg/L
 VF = volatilization factor L/m³

1. Calculate kiG (gas-phase mass transfer coefficient of component i)

$$kiG = (M_{H_2O}/M_i)^{0.335} \times (T/298)^{1.005} \times kG, H_2O$$

Where:

kiG = gas-phase mass transfer coefficient of component i cm/s
 MW_{H₂O} = molecular weight of water = 18 g/mol
 MW_{TCE} = molecular weight of TCE = 131.39 g/mol
 kG, H₂O = gas-phase mass transfer coefficient of water vapor at 25°C cm/s = 0.833 cm/s
 T = average system absolute temperature = 298
 The value of kG, H₂O is 0.833 cm/s (Superfund Exposure Assessment Manual, U. S. EPA, April 1988)

$$kiG = (18/131.39)^{0.335} \times (298/298)^{1.005} \times 0.833 \text{ cm/s} = 4.28E-01 \text{ cm/s}$$

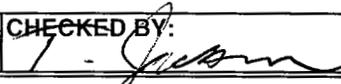
2. Calculate kiL (liquid-phase mass transfer coefficient of component i)

$$kiL = (M_{O_2}/M_i)^{0.5} \times (T/298) \times kL, O_2$$

Where:

kiL = liquid-phase mass transfer coefficient of component i cm/s
 MW_{O₂} = molecular weight of O₂ = 32 g/mol
 MW_{TCE} = molecular weight of TCE = 131.39 g/mol
 T = average system absolute temperature = 298
 kL, O₂ = liquid-phase mass transfer coefficient of oxygen at 25°C cm/s = 0.002 cm/s

$$kiL = (32/131.39)^{0.5} \times (298/298) \times 0.002 \text{ cm/s} = 9.87E-04 \text{ cm/s}$$

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: ESTIMATION OF AMBIENT AIR CONCENTRATIONS IN A TRENCH RESULTING FROM VOLATILE EMISSIONS FROM GROUNDWATER.		
BASED ON: VDEQ, 2002		
BY: R. JUPIN	CHECKED BY: 	DATE: 01/04/2008

3. Calculate Ki (overall mass transfer coefficient of contaminant)

$$K_i = 1 / \{ (1/k_{iL}) + [(RT) / (H_i \times k_{iG})] \}$$

Where:

- kiL = liquid-phase mass transfer coefficient of i cm/s = 9.87E-04
- R = ideal gas constant atm-m³/mole-°K = 8.20E-05
- T = average system absolute temperature = 298
- Hi = Henry's Law constant of TCE (atm-m³/mol) = 1.03E-02
- KiG = gas-phase mass transfer coefficient of i cm/s 4.28E-01

$$K_i = 1 / \{ (1/9.78E-4) + [(298 \times 8.2E-5) / (1.03E-2 \times 0.428)] \} = 9.82E-04 \text{ cm/s}$$

4. Calculation of VF (Volatilization Factor)

$$VF = (K_i \times A \times F \times 10^{-3} \times 10^4 \times 3,600) / (ACH \times V)$$

Where:

- VF = volatilization factor (L/m³)
- Ki = overall mass transfer coefficient of contaminant = 9.82E-04 cm/s
- A = area of the trench = 8.18 m²
- F = fraction of floor through which contaminant can enter (unitless) = 1
- ACH = air changes per hour = 360 h⁻¹
- V = volume of trench = 24.92 m³
- 10⁻³ = conversion factor L/cm³ 0.001
- 10⁴ = conversion factor cm²/m² 10000
- 3,600 = conversion factor seconds/hr 3600

$$VF = (9.82E-4 \times 8.18 \times 1 \times 10^{-3} \times 10^4 \times 3,600) / (360 \times 24.92) = 3.22E-02 \text{ L/m}^3$$

5. Calculation of C_{trench} (concentration of contaminant in the trench)

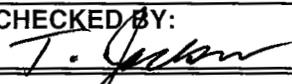
$$C_{trench} = C_{GW} \times VF$$

Where:

- C_{trench} = concentration of contaminant in the trench (µg/m³)
- C_{GW} = concentration of TCE in groundwater = 12.8 µg/L
- VF = volatilization factor = 3.22E-02 L/m³

$$C_{trench} = 12.8 \text{ µg/L} \times 3.22E-02 \text{ L/m}^3 = 4.12E-01 \text{ µg/m}^3$$

CALCULATION WORKSHEET

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF VOLATILE EMISSIONS FROM GROUNDWATER BY A CONSTRUCTION WORKER		
BASED ON: U.S. EPA, DECEMBER 1989		
BY: R. JUPIN	CHECKED BY: 	DATE: 01/04/2008

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from inhalation of fugitive dust and volatiles.

EQUATION:
$$IEX = \frac{Ca \times IR \times ET \times EF \times ED \times CF}{BW \times AT}$$

Where:

- IEX = estimated exposure intake (mg/kg/day)
- Ca = exposure point concentration in air (ug/m3)
- IR = inhalation rate (m3/hr)
- ET = exposure time (hrs/day)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- CF = conversion factor (mg/ug)
- BW = body weight (kg)
- AT = averaging time (days)
- CSFi = inhalation carcinogenic slope factor ((mg/kg/day)⁻¹)
- RfDi = inhalation noncarcinogenic reference dose (mg/kg/day)

RISKS:

- ILCR (Carcinogens) = Intake (mg/kg/day) x CSFi (mg/kg/day)⁻¹
- HQ (Noncarcinogens) = Intake (mg/kg/day) / RfDi (mg/kg/day)

ASSUMPTIONS:

- Ca = 4.12E-01 ug/m3 Chemical: Trichloroethene
- IR = 2.5 m3/hr
- ET = 4 hr/day
- EF = 30 days/year
- ED = 1 years
- CF = 0.001 mg/ug
- BW = 70 kg
- ATc = 25550 days
- ATnc = 365 days
- CSFi = 7.0E-03 (mg/kg/day)⁻¹
- RfDi = 1.70E-01 (mg/kg/day)

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INHALATION OF VOLATILE EMISSIONS FROM GROUNDWATER BY A CONSTRUCTION WORKER		
BASED ON: U.S. EPA, DECEMBER 1989		
BY: R. JUPIN	CHECKED BY: <i>J. Jackson</i>	DATE: 01/04/2008

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{4.12E-01 \text{ ug/m}^3 \times 2.5 \text{ m}^3/\text{hr} \times 4 \text{ hr/day} \times 30 \text{ days/year} \times 1 \text{ years} \times 0.001 \text{ mg/ug}}{70 \text{ kg} \times 25550 \text{ days}}$$

$$IEXc = 6.91E-08 \text{ mg/kg/day} \quad \checkmark$$

$$ILCR = 6.91E-08 \text{ mg/kg/day} \times 7.00E-03 \text{ (mg/kg/day)}^{-1} = \text{Incremental Lifetime Cancer Risk}$$

$$ILCR = 4.8E-10 \quad \checkmark$$

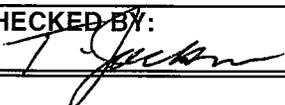
EXAMPLE NONCARCINOGENIC CALCULATION

$$IEXnc = \frac{4.12E-01 \text{ ug/m}^3 \times 2.5 \text{ m}^3/\text{hr} \times 4 \text{ hr/day} \times 30 \text{ days/year} \times 1 \text{ years} \times 0.001 \text{ mg/ug}}{70 \text{ kg} \times 365 \text{ days}}$$

$$IEXnc = 4.84E-06 \text{ mg/kg/day} \quad \checkmark$$

$$HQ = 4.84E-06 \text{ mg/kg/day} / 1.70E-01 \text{ (mg/kg/day)} = \text{Hazard Quotient}$$

$$HQ = 2.8E-05 \quad \checkmark$$

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SURFACE WATER MAINTENANCE WORKER		
BASED ON: USEPA, DEC. 1989		
BY: R. JUPIN	CHECKED BY: 	DATE: 01/04/2008

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from incidental ingestion of surface water by a maintenance worker.

EQUATION:
$$IEX = \frac{C_{sw} \times CF \times CR_{sw} \times ET \times EF \times ED}{BW \times AT}$$

Where:

- IEX = estimated exposure intake (mg/kg/day)
- C_{sw} = exposure point concentration in surface water (ug/L)
- CF = conversion factor (1.0E-3 mg/ug)
- CR_{sw} = contact rate (L/hour)
- ET = exposure time (hours/day)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- BW = body weight (kg)
- AT = averaging time (days)
- CSFo = oral carcinogenic slope factor ((mg/kg/day)⁻¹)
- RfDo = oral noncarcinogenic reference dose (mg/kg/day)

RISKS:

ILCR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)⁻¹
 HQ (Noncarcinogens) = Intake (mg/kg/day) / RfDo (mg/kg/day)

ASSUMPTIONS:

- C_{sw} = 19 ug/L Chemical: Bis(2-ethylhexyl)phthalate
- CR_{sw} = 0.01 L/hr
- CF = 1.0E-03 mg/ug
- ET = 1 hours
- EF = 24 days/year
- ED = 25 years
- BW = 70 kg
- ATc = 25550 days
- ATnc = 9125 days
- CSFo = 1.4E-02 (mg/kg/day)⁻¹
- RfDo = 2.0E-02 (mg/kg/day)

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SURFACE WATER MAINTENANCE WORKER		
BASED ON: USEPA, DEC. 1989		
BY: R. JUPIN	CHECKED BY: <i>T. Johnson</i>	DATE: 01/04/2008

EXAMPLE CARCINOGENIC CALCULATION

$$\text{IEXc} = \frac{19 \text{ ug/L} \times 1.0\text{E-}03 \text{ mg/ug} \times 0.01 \text{ L/hr} \times 1 \text{ hours} \times 24 \text{ days/year} \times 25 \text{ years}}{70 \text{ kg} \times 25550 \text{ days}}$$

$$\text{IEXc} = 6.37\text{E-}08 \text{ mg/kg/day} \quad \checkmark$$

$$\text{ILCR} = 6.37\text{E-}08 \text{ mg/kg/day} \times 1.40\text{E-}02 \text{ (mg/kg/day)}^{-1} = \text{Incremental Lifetime Cancer Risk}$$

$$\text{ILCR} = 8.92\text{E-}10 \quad \checkmark$$

EXAMPLE NONCARCINOGENIC CALCULATION

$$\text{IEXnc} = \frac{19 \text{ ug/L} \times 1.0\text{E-}03 \text{ mg/ug} \times 0.01 \text{ L/hr} \times 1 \text{ hours} \times 24 \text{ days/year} \times 25 \text{ years}}{70 \text{ kg} \times 9125 \text{ days}}$$

$$\text{IEXnc} = 1.78\text{E-}07 \text{ mg/kg/day} \quad \checkmark$$

$$\text{HQ} = \frac{1.78\text{E-}07 \text{ mg/kg/day}}{2.00\text{E-}02 \text{ (mg/kg/day)}} = \text{Hazard Quotient}$$

$$\text{HQ} = 8.92\text{E-}06 \quad \checkmark$$

CALCULATION WORKSHEET

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SURFACE WATER MAINTENANCE WORKER		
BASED ON: USEPA, DEC. 1989, 2004		
BY: R. JUPIN	CHECKED BY: <i>T. Johnson</i>	DATE: 01/04/2008

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from dermal contact with surface water by a maintenance worker.

EQUATION:
$$DAD = \frac{DA_{event} \times EV \times ED \times EF \times A}{BW \times AT}$$

Where:

- DAD = dermally absorbed dose (mg/kg/day)
- DA_{event} = absorbed does per event (mg/cm²/event)
- EV = event frequency (events/day)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- A = skin surface available for contact (cm²)
- BW = body weight (kg)
- AT = averaging time (days)
- CSFd = dermal carcinogenic slope factor ((mg/kg/day)⁻¹)
- RfDd = dermal noncarcinogenic reference dose (mg/kg/day)

RISKS:

ICLR (Carcinogens) = DAD (mg/kg/day) x CSFd (mg/kg/day)⁻¹
 HQ (Noncarcinogens) = DAD (mg/kg/day) / RfDd (mg/kg/day)

EQUATIONS for DA_{event}:

For Inorganics:

DA_{event} = Kp x Cw x CF x tevent

For Organics:

If tevent ≤ t', then: $DA_{event} = 2 \times FA \times Kp \times Cw \times CF \times \sqrt{\frac{6 \times \text{tau} \times \text{tevent}}{\pi}}$

If tevent > t', then: $DA_{event} = FA \times Kp \times Cw \times CF \times \left[\frac{\text{tevent}}{1+B} + 2 \times \text{tau} \times \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]$

CALCULATION WORKSHEET

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SURFACE WATER MAINTENANCE WORKER		
BASED ON: USEPA, DEC. 1989, 2004		
BY: R. JUPIN	CHECKED BY: 	DATE: 01/04/2008

Where:

- Kp = permeability coefficient from water (cm/hr)
- Cgw = concentration of chemical in groundwater (mg/L)
- tevent = duration of event (hr/event)
- CF = conversion factor (0.001 L/cm³)
- t* = time it takes to reach steady-state (hr/event)
- τ = lag time (hr/event)
- B = Bunge Model Constant (dimensionless)

EXAMPLE CALCULATION OF DAevent

ASSUMPTIONS:

- Cgw = 0.019 mg/L Chemical: Bis(2-ethylhexyl)phthalate
- Kp = 2.49E-02 cm/hr
- FA = 0.8 unitless
- tevent = 1 hr/event
- CF = 0.001 L/cm³
- t* = 39.9 hr/event
- τ = 16.60 hr/event
- B = 0.19

tevent < t*, therefore,

$$DA_{event} = (2 \times 2.49E-02 \text{ cm/hr}) (0.8) (0.019 \text{ mg/L}) (0.001 \text{ L/cm}^3) \times$$

$$\sqrt{\frac{6 \times 16.6 \text{ hr/event} \times 1 \text{ hr/event}}{\pi}}$$

$$DA_{event} = 4.26E-06 \text{ mg/cm}^2\text{-event} \quad \checkmark$$

RISK CALCULATIONS

ASSUMPTIONS:

- A = 3300 cm²/day
- EV = 1 event/day
- ED = 25 years
- EF = 24 days/year
- BW = 70 kg
- ATc = 25550 days
- ATnc = 9125 days
- CSFd = 1.4E-02 (mg/kg/day)⁻¹
- RfDd = 2.0E-02 (mg/kg/day)

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SURFACE WATER MAINTENANCE WORKER		
BASED ON: USEPA, DEC. 1989, 2004		
BY: R. JUPIN	CHECKED BY: <i>T. Galan</i>	DATE: 01/04/2008

EXAMPLE CARCINOGENIC CALCULATION

$$\text{DADc} = \frac{4.26\text{E-}06 \text{ mg/cm}^2\text{-event} \times 1 \text{ event/day} \times 25 \text{ years} \times 24 \text{ days/year} \times 3300 \text{ cm}^2\text{/day}}{70 \text{ kg} \times 25550 \text{ days}}$$

$$\text{DADc} = 4.72\text{E-}06 \text{ mg/kg/day} \quad \checkmark$$

$$\text{DADc} = 4.72\text{E-}06 \text{ mg/kg/day} \times 1.40\text{E-}02 \text{ (mg/kg/day)}^{-1} = \text{Incremental Lifetime Cancer Risk}$$

$$\text{ICLR} = 6.61\text{E-}08 \quad \checkmark$$

EXAMPLE NONCARCINOGENIC CALCULATION

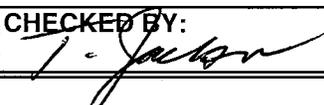
$$\text{DADnc} = \frac{4.26\text{E-}06 \text{ mg/cm}^2\text{-event} \times 1 \text{ event/day} \times 25 \text{ years} \times 24 \text{ days/year} \times 3300 \text{ cm}^2\text{/day}}{70 \text{ kg} \times 9125 \text{ days}}$$

$$\text{DADnc} = 1.32\text{E-}05 \text{ mg/kg/day} \quad \checkmark$$

$$\text{HQ} = 1.32\text{E-}05 \text{ mg/kg/day} / 2.00\text{E-}02 \text{ (mg/kg/day)} = \text{Hazard Quotient}$$

$$\text{HQ} = 6.61\text{E-}04 \quad \checkmark$$

CALCULATION WORKSHEET

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SEDIMENT ADOLESCENT TRESPASSER		
BASED ON: USEPA, DEC. 1989		
BY: R. JUPIN	CHECKED BY: 	DATE: 01/04/2008

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from incidental ingestion of sediment by an adolescent trespasser.

EQUATION:
$$IEX = \frac{CS \times IR \times EF \times ED \times FI \times CF}{BW \times AT}$$

Where:

- IEX = estimated exposure intake (mg/kg/day)
- Cs = exposure point concentration in soil/sediment (mg/kg)
- IR = incidental soil ingestion rate (mg/day)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- FI = fraction ingested from contaminated source (unitless)
- CF = conversion factor (1.0E-6 kg/mg)
- BW = body weight (kg)
- AT = averaging time (days)
- CSFo = oral carcinogenic slope factor ((mg/kg/day)⁻¹)
- RfDo = oral noncarcinogenic reference dose (mg/kg/day)

RISKS:

ICLR (Carcinogens) = Intake (mg/kg/day) x CSFo (mg/kg/day)⁻¹
 HQ (Noncarcinogens) = Intake (mg/kg/day) / RfDo (mg/kg/day)

ASSUMPTIONS:

- Cs = 7.83 mg/kg Chemical: Arsenic
- IR = 100 mg/day
- EF = 30 days/year
- ED = 11 years
- FI = 1
- CF = 1.0E-06 kg/mg
- BW = 45 kg
- ATc = 25550 days
- ATnc = 4015 days
- CSFo = 1.5E+00 (mg/kg/day)⁻¹
- RfDo = 3.0E-04 (mg/kg/day)

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM INCIDENTAL INGESTION OF SEDIMENT ADOLESCENT TRESPASSER		
BASED ON: USEPA, DEC. 1989		
BY: R. JUPIN	CHECKED BY: <i>T. Jackson</i>	DATE: 01/04/2008

EXAMPLE CARCINOGENIC CALCULATION

$$IEXc = \frac{7.83 \text{ mg/kg} \times 100 \text{ mg/day} \times 30 \text{ days/year} \times 11 \text{ years} \times 1 \times 1.0E-06 \text{ kg/mg}}{45 \text{ kg} \times 25550 \text{ days}}$$

$$IEXc = 2.25E-07 \text{ mg/kg/day} \quad \checkmark$$

$$ICLR = 2.25E-07 \text{ mg/kg/day} \times 1.50E+00 \text{ (mg/kg/day)}^{-1} = \text{Incremental Lifetime Cancer Risk}$$

$$ICLR = 3.37E-07 \quad \checkmark$$

EXAMPLE NONCARCINOGENIC CALCULATION

$$IEXnc = \frac{7.83 \text{ mg/kg} \times 100 \text{ mg/day} \times 30 \text{ days/year} \times 11 \text{ years} \times 1 \times 1.0E-06 \text{ kg/mg}}{45 \text{ kg} \times 4015 \text{ days}}$$

$$IEXnc = 1.43E-06 \text{ mg/kg/day} \quad \checkmark$$

$$HQ = \frac{1.43E-06 \text{ mg/kg/day}}{3.00E-04 \text{ (mg/kg/day)}} = \text{Hazard Quotient}$$

$$HQ = 4.77E-03 \quad \checkmark$$

CALCULATION WORKSHEET

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SEDIMENT ADOLESCENT TRESPASSER		
BASED ON: USEPA, DEC. 2004		
BY: R. JUPIN	CHECKED BY: <i>[Signature]</i>	DATE: 01/04/2008

PURPOSE: To estimate intake, carcinogenic and noncarcinogenic risks from dermal contact with sediment by an adolescent trespasser.

EQUATION:
$$DEX = \frac{CS \times CF \times SA \times AF \times ABS \times EF \times ED}{BW \times AT}$$

Where:

- DEX = estimated exposure intake (mg/kg/day)
- Cs = exposure point concentration in soil/sediment (mg/kg)
- CF = conversion factor (1.0E-6 kg/mg)
- SA = skin surface available for contact (cm²/day)
- ABS = absorption factor (unitless)
- AF = adherence factor (mg/cm²)
- EF = exposure frequency (days/year)
- ED = exposure duration (years)
- BW = body weight (kg)
- AT = averaging time (days)
- CSFd = dermal carcinogenic slope factor ((mg/kg/day)⁻¹)
- RfDd = dermal noncarcinogenic reference dose (mg/kg/day)

RISKS:

ICLR (Carcinogens) = Intake (mg/kg/day) x CSFd (mg/kg/day)⁻¹
 HQ (Noncarcinogens) = Intake (mg/kg/day) / RfDd (mg/kg/day)

ASSUMPTIONS:

- Cs = 7.83 mg/kg Chemical: Arsenic
- CF = 1.0E-06 kg/mg
- SA = 3250 cm²/day
- AF = 0.2 mg/cm²
- ABS = 0.03
- EF = 30 days/year
- ED = 11 years
- BW = 45 kg
- ATc = 25550 days
- ATnc = 4015 days
- CSFd = 1.5E+00 (mg/kg/day)⁻¹
- RfDd = 3.0E-04 (mg/kg/day)

CLIENT: NCBC GULFPORT, GULFPORT, MISSISSIPPI		JOB NUMBER: 0464
SUBJECT: CALCULATION OF INTAKE/RISK FROM DERMAL CONTACT WITH SEDIMENT ADOLESCENT TRESPASSER		
BASED ON: USEPA, DEC. 2004		
BY: R. JUPIN	CHECKED BY: <i>T. Jackson</i>	DATE: 01/04/2008

EXAMPLE CARCINOGENIC CALCULATION

$$DEXc = \frac{7.83 \text{ mg/kg} \times 1.0E-06 \text{ kg/mg} \times 3250 \text{ cm}^2/\text{day} \times 0.2 \text{ mg/cm}^2 \times 0.03 \times 30 \text{ days/year} \times 11 \text{ years}}{45 \text{ kg} \times 25550 \text{ days}}$$

DEXc = 4.38E-08 mg/kg/day ✓

ICLR = 4.38E-08 mg/kg/day x 1.50E+00 (mg/kg/day)⁻¹ = Incremental Lifetime Cancer Risk

ICLR = 6.57E-08 ✓

EXAMPLE NONCARCINOGENIC CALCULATION

$$DEXnc = \frac{7.83 \text{ mg/kg} \times 1.0E-06 \text{ kg/mg} \times 3250 \text{ cm}^2/\text{day} \times 0.2 \text{ mg/cm}^2 \times 0.03 \times 30 \text{ days/year} \times 11 \text{ years}}{45 \text{ kg} \times 4015 \text{ days}}$$

DEXnc = 2.79E-07 mg/kg/day ✓

HQ = 2.79E-07 mg/kg/day / 3.00E-04 (mg/kg/day) = Hazard Quotient

HQ = 9.30E-04 ✓

APPENDIX D.3

LEAD MODELING RESULTS

LEAD MODEL FOR WINDOWS Version 1.0

```

=====
Model Version: 1.0 Build 264 (Page 1 of 3)
Location: NCBC, Gulfport, Mississippi
Site Name: Site 3
Date: 1/07/2008
Run Mode: Site Risk Assessment
-----

```

```

# Soil/Dust Data
Average concentration of lead in surface soil = 18.4 mg/kg.
# Water Data
Maximum concentration of lead in groundwater = 19.4 ug/L.
=====

```

The time step used in this model run: 1 - Every 4 Hours (6 times a day).

***** Air *****

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m ³ /day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m ³)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

***** Diet *****

Age	Diet Intake (ug/day)
.5-1	5.530
1-2	5.780
2-3	6.490
3-4	6.240
4-5	6.010
5-6	6.340
6-7	7.000

***** Drinking Water *****

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 19.400 ug Pb/L

Model Version: 1.0 Build 264

(Page 2 of 3)

Location: NCBC, Gulfport, Mississippi

Site Name: Site 3

Date: 1/07/2008

Run Mode: Site Risk Assessment

***** Soil & Dust *****

Multiple Source Analysis Used

Average multiple source concentration: 22.880 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700

Outdoor airborne lead to indoor household dust lead concentration: 100.000

Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	18.400	22.880
1-2	18.400	22.880
2-3	18.400	22.880
3-4	18.400	22.880
4-5	18.400	22.880
5-6	18.400	22.880
6-7	18.400	22.880

***** Alternate Intake *****

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

***** Maternal Contribution: Infant Model *****

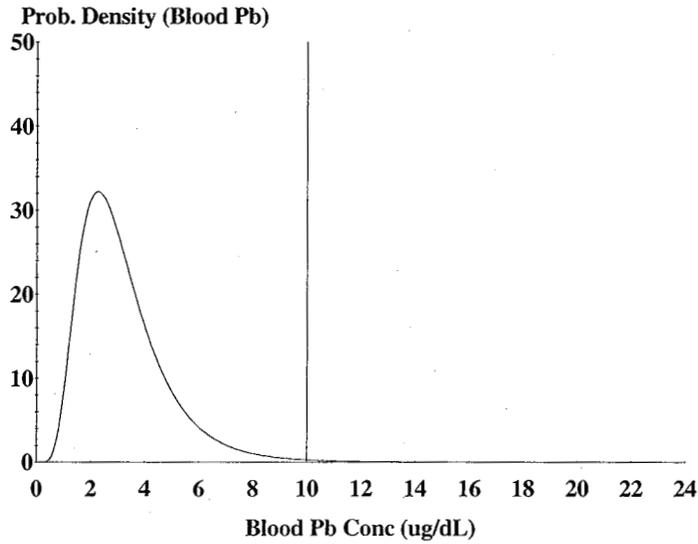
Maternal Blood Concentration: 2.500 ug Pb/dL

CALCULATED BLOOD LEAD AND LEAD UPTAKES:

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	2.614	0.000	1.834
1-2	0.034	2.694	0.000	4.521
2-3	0.062	3.044	0.000	4.732
3-4	0.067	2.954	0.000	4.867
4-5	0.067	2.867	0.000	5.091
5-6	0.093	3.035	0.000	5.386
6-7	0.093	3.357	0.000	5.489

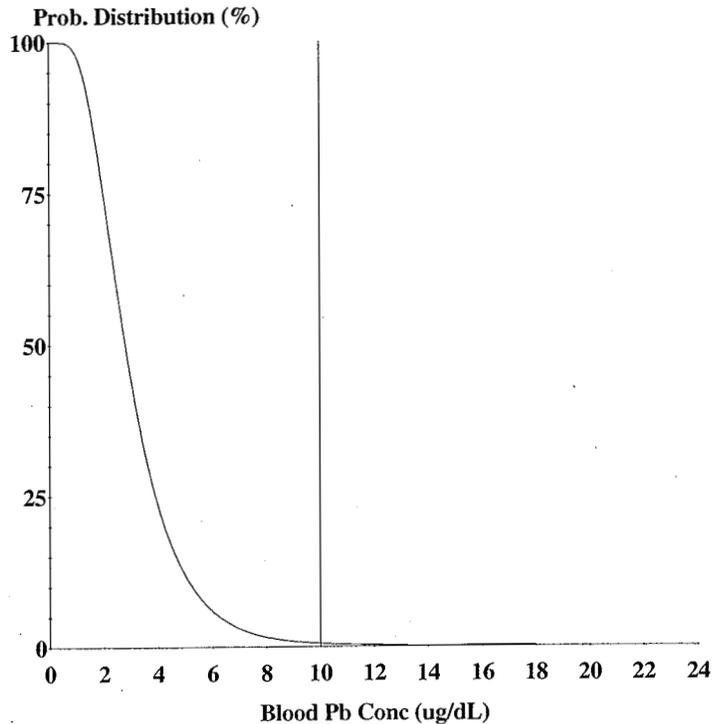
Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	0.503	4.971	2.7
1-2	0.788	8.037	3.3
2-3	0.793	8.631	3.2
3-4	0.800	8.687	3.0
4-5	0.597	8.622	2.9
5-6	0.539	9.054	2.8
6-7	0.510	9.450	2.6

=====
Model Version: 1.0 Build 264
Location: NCBC, Gulfport, Mississippi
Site Name: Site 3
Date: 1/07/2008
Run Mode: Site Risk Assessment
=====



Cutoff = 10.000 ug/dl
Geo Mean = 2.938
GSD = 1.600
% Above = 0.458
% Below = 99.542

Age Range = 0 to 84 months
Time Step = Every 4 Hours
Run Mode = Site Risk Assessment
Comment = Site 3



Cutoff = 10.000 ug/dl
Geo Mean = 2.938
GSD = 1.600
% Above = 0.458

Age Range = 0 to 84 months
Time Step = Every 4 Hours
Run Mode = Site Risk Assessment
Comment = Site 3

APPENDIX D.4

VAPOR INTRUSION MODELING RESULTS

DATA ENTRY SHEET

GW-SCREEN
Version 3.1; 02/04

Reset to
Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_w ($\mu\text{g/L}$)	Chemical
71432	2.22E+00	Benzene

MORE
↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_s ($^{\circ}\text{C}$)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	45	LS	21	

MORE
↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type <input type="button" value="Lookup Soil
Parameters"/>	ENTER Vadose zone soil dry bulk density, ρ_b^v (g/cm^3)	ENTER Vadose zone soil total porosity, n^v (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^v (cm^3/cm^3)
LS			LS	1.62	0.39	0.076

MORE
↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350
Used to calculate risk-based groundwater concentration.					

CHEMICAL PROPERTIES SHEET

ABC

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^\circ\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^\circ\text{K}$)	Critical temperature, T_C ($^\circ\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.54E-03	25	7,342	353.24	562.16	5.89E+01	1.79E+03	7.8E-06	3.0E-02

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm ³ /cm ³)	Vadose zone effective total fluid saturation, S_{te} (cm ³ /cm ³)	Vadose zone soil intrinsic permeability, k_i (cm ²)	Vadose zone soil relative air permeability, k_{rg} (cm ²)	Vadose zone soil effective vapor permeability, k_v (cm ²)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm ³ /cm ³)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm ³ /cm ³)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm ³ /cm ³)	Floor-wall seam perimeter, X_{crack} (cm)
30	0.314	0.079	1.65E-08	0.957	1.58E-08	18.75	0.39	0.087	0.303	4,000

Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	Area of enclosed space below grade, A_B (cm ²)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D_v^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)
1.69E+04	1.00E+06	4.00E-04	15	8,009	4.61E-03	1.91E-01	1.79E-04	1.22E-02	1.79E-04	2.84E-04

Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} (µg/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm ³ /s)	Crack effective diffusion coefficient, D^{crack} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
30	15	4.24E+02	0.10	1.56E+01	1.22E-02	4.00E+02	7.44E+13	3.48E-04	1.47E-01	7.8E-06	3.0E-02

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	1.79E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
4.7E-07	4.7E-03

MESSAGE SUMMARY BELOW:

END

DATA ENTRY SHEET

GW-SCREEN
Version 3.1; 02/04

Reset to
Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_w ($\mu\text{g/L}$)	Chemical
74873	2.33E+00	Methyl chloride (chloromethane)

MORE
↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_s ($^{\circ}\text{C}$)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	45	LS	21	

MORE
↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type <input type="button" value="Lookup Soil
Parameters"/>	ENTER Vadose zone soil dry bulk density, ρ_b^v (g/cm^3)	ENTER Vadose zone soil total porosity, n^v (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^v (cm^3/cm^3)
LS			LS	1.62	0.39	0.076

MORE
↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350
Used to calculate risk-based groundwater concentration.					

CHEMICAL PROPERTIES SHEET

ABC

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^\circ\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^\circ\text{K}$)	Critical temperature, T_C ($^\circ\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)
1.26E-01	6.50E-06	8.80E-03	25	5,115	249.00	416.25	2.12E+00	5.33E+03	0.0E+00	9.0E-02

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm ³ /cm ³)	Vadose zone effective total fluid saturation, S_{te} (cm ³ /cm ³)	Vadose zone soil intrinsic permeability, k_i (cm ²)	Vadose zone soil relative air permeability, k_{rg} (cm ²)	Vadose zone soil effective vapor permeability, k_v (cm ²)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm ³ /cm ³)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm ³ /cm ³)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm ³ /cm ³)	Floor-wall seam perimeter, X_{crack} (cm)
30	0.314	0.079	1.65E-08	0.957	1.58E-08	18.75	0.39	0.087	0.303	4,000

Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	Area of enclosed space below grade, A_B (cm ²)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D_v^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)
1.69E+04	1.00E+06	4.00E-04	15	4,615	7.91E-03	3.28E-01	1.79E-04	1.75E-02	2.50E-04	3.97E-04

Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} (µg/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm ³ /s)	Crack effective diffusion coefficient, D^{crack} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
30	15	7.64E+02	0.10	1.56E+01	1.75E-02	4.00E+02	4.88E+09	4.23E-04	3.23E-01	NA	9.0E-02

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	5.33E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	3.4E-03

MESSAGE SUMMARY BELOW:

END

DATA ENTRY SHEET

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_w ($\mu\text{g/L}$)	Chemical
156592	1.16E+02	cis-1,2-Dichloroethylene

MORE
↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_s ($^{\circ}\text{C}$)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	45	LS	21	

MORE
↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type <input type="button" value="Lookup Soil Parameters"/>	ENTER Vadose zone soil dry bulk density, ρ_b^v (g/cm^3)	ENTER Vadose zone soil total porosity, n^v (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^v (cm^3/cm^3)
LS			LS	1.62	0.39	0.076

MORE
↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350
Used to calculate risk-based groundwater concentration.					

CHEMICAL PROPERTIES SHEET

ABC

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^\circ\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^\circ\text{K}$)	Critical temperature, T_C ($^\circ\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)
7.36E-02	1.13E-05	4.07E-03	25	7,192	333.65	544.00	3.55E+01	3.50E+03	0.0E+00	3.5E-02

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm ³ /cm ³)	Vadose zone effective total fluid saturation, S_{te} (cm ³ /cm ³)	Vadose zone soil intrinsic permeability, k_i (cm ²)	Vadose zone soil relative air permeability, k_{rg} (cm ²)	Vadose zone soil effective vapor permeability, k_v (cm ²)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm ³ /cm ³)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm ³ /cm ³)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm ³ /cm ³)	Floor-wall seam perimeter, X_{crack} (cm)
30	0.314	0.079	1.65E-08	0.957	1.58E-08	18.75	0.39	0.087	0.303	4,000

Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	Area of enclosed space below grade, A_B (cm ²)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D_v^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)
1.69E+04	1.00E+06	4.00E-04	15	7,623	3.42E-03	1.42E-01	1.79E-04	1.02E-02	1.54E-04	2.45E-04

Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} (µg/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm ³ /s)	Crack effective diffusion coefficient, D^{crack} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
30	15	1.64E+04	0.10	1.56E+01	1.02E-02	4.00E+02	3.85E+16	3.16E-04	5.19E+00	NA	3.5E-02

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	3.50E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.4E-01

MESSAGE SUMMARY BELOW:

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

END

DATA ENTRY SHEET

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_w ($\mu\text{g/L}$)	Chemical
79016	1.28E+01	Trichloroethylene

MORE
↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_s ($^{\circ}\text{C}$)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	45	LS	21	

MORE
↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type <input type="button" value="Lookup Soil Parameters"/>	ENTER Vadose zone soil dry bulk density, ρ_b^v (g/cm^3)	ENTER Vadose zone soil total porosity, n^v (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^v (cm^3/cm^3)
LS			LS	1.62	0.39	0.076

MORE
↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350
Used to calculate risk-based groundwater concentration.					

CHEMICAL PROPERTIES SHEET

ABC

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^\circ\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^\circ\text{K}$)	Critical temperature, T_C ($^\circ\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)
7.90E-02	9.10E-06	1.03E-02	25	7,505	360.36	544.20	1.66E+02	1.47E+03	2.0E-06	6.0E-01

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm ³ /cm ³)	Vadose zone effective total fluid saturation, S_{te} (cm ³ /cm ³)	Vadose zone soil intrinsic permeability, k_i (cm ²)	Vadose zone soil relative air permeability, k_{rg} (cm ²)	Vadose zone soil effective vapor permeability, k_v (cm ²)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm ³ /cm ³)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm ³ /cm ³)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm ³ /cm ³)	Floor-wall seam perimeter, X_{crack} (cm)
30	0.314	0.079	1.65E-08	0.957	1.58E-08	18.75	0.39	0.087	0.303	4,000

Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	Area of enclosed space below grade, A_B (cm ²)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D_v^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)
1.69E+04	1.00E+06	4.00E-04	15	8,420	8.47E-03	3.51E-01	1.79E-04	1.10E-02	1.58E-04	2.51E-04

Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} (µg/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm ³ /s)	Crack effective diffusion coefficient, D^{crack} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
30	15	4.49E+03	0.10	1.56E+01	1.10E-02	4.00E+02	2.83E+15	3.22E-04	1.44E+00	2.0E-06	6.0E-01

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	1.47E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
1.2E-06	2.3E-03

MESSAGE SUMMARY BELOW:

MESSAGE: Risk/HQ or risk-based groundwater concentration is based on a route-to-route extrapolation.

END

DATA ENTRY SHEET

GW-SCREEN
Version 3.1; 02/04

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_w ($\mu\text{g/L}$)	Chemical
75014	1.71E+01	Vinyl chloride (chloroethene)

MORE
↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_s ($^{\circ}\text{C}$)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	45	LS	21	

MORE
↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type <input type="button" value="Lookup Soil Parameters"/>	ENTER Vadose zone soil dry bulk density, ρ_b^v (g/cm^3)	ENTER Vadose zone soil total porosity, n^v (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^v (cm^3/cm^3)
LS			LS	1.62	0.39	0.076

MORE
↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350
Used to calculate risk-based groundwater concentration.					

CHEMICAL PROPERTIES SHEET

ABC

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($\text{atm}\cdot\text{m}^3/\text{mol}$)	Henry's law constant reference temperature, T_R ($^\circ\text{C}$)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B ($^\circ\text{K}$)	Critical temperature, T_C ($^\circ\text{K}$)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu\text{g}/\text{m}^3$) ⁻¹	Reference conc., RfC (mg/m^3)
1.06E-01	1.23E-05	2.69E-02	25	5,250	259.25	432.00	1.86E+01	8.80E+03	8.8E-06	1.0E-01

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm ³ /cm ³)	Vadose zone effective total fluid saturation, S_{te} (cm ³ /cm ³)	Vadose zone soil intrinsic permeability, k_i (cm ²)	Vadose zone soil relative air permeability, k_{rg} (cm ²)	Vadose zone soil effective vapor permeability, k_v (cm ²)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm ³ /cm ³)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm ³ /cm ³)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm ³ /cm ³)	Floor-wall seam perimeter, X_{crack} (cm)
30	0.314	0.079	1.65E-08	0.957	1.58E-08	18.75	0.39	0.087	0.303	4,000

Bldg. ventilation rate, $Q_{building}$ (cm ³ /s)	Area of enclosed space below grade, A_B (cm ²)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m ³ /mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D_v^{eff} (cm ² /s)	Capillary zone effective diffusion coefficient, D_{cz}^{eff} (cm ² /s)	Total overall effective diffusion coefficient, D_T^{eff} (cm ² /s)
1.69E+04	1.00E+06	4.00E-04	15	4,875	2.41E-02	9.98E-01	1.79E-04	1.47E-02	2.10E-04	3.33E-04

Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} (µg/m ³)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm ³ /s)	Crack effective diffusion coefficient, D^{crack} (cm ² /s)	Area of crack, A_{crack} (cm ²)	Exponent of equivalent foundation Peclet number, $\exp(Pe^f)$ (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m ³)	Unit risk factor, URF (µg/m ³) ⁻¹	Reference conc., RfC (mg/m ³)
30	15	1.71E+04	0.10	1.56E+01	1.47E-02	4.00E+02	3.28E+11	3.83E-04	6.53E+00	8.8E-06	1.0E-01

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	8.80E+06	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
2.4E-05	6.3E-02

MESSAGE SUMMARY BELOW:

END

APPENDIX E

**SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT
FOOD-CHAIN MODELING**

APPENDIX E
FOOD CHAIN MODELING AT SITE 3

The objective of the food chain modeling was to evaluate potential risks to representative receptors from screening-level COPCs in Site 3 sediment and surface water that are known to bioaccumulate or biomagnify. USEPA Region 4 considers chemicals in this category to consist of those so designated in *Bioaccumulation Testing and Interpretation for the Purpose of Sediment Quality Assessment, Status and Needs* (USEPA, 2000), with the exception of PAHs. USEPA Region 4 does not consider PAHs to bioaccumulate unless they are present at percent levels in soil or sediment. Screening-level COPCs in Site 3 sediment and surface water are shown in Tables 7-2 and 7-3 of the ecological risk assessment; those that are known to bioaccumulate or biomagnify consist of 4,4'-DDE, 4,4'-DDT, total DDT, alpha-BHC, delta-BHC, alpha-chlordane, gamma-chlordane, Aroclor-1254, Aroclor-1260, total Aroclor, arsenic, copper, and lead. The remaining COPCs are not known to bioaccumulate or biomagnify and were not included in the food chain model.

Risk via the food chain was evaluated using two scenarios. The first scenario used maximum detected COPC concentrations in sediment and surface water and conservative assumptions for body weight, food consumption, and sediment ingestion. The second scenario used average COPC concentrations, and less conservative values for body weight, food consumption, and sediment ingestion, except where noted. For brevity, the first scenario will hereafter be referred to as the conservative scenario, and the second scenario will be referred to as the average scenario. For each scenario, ingested doses for birds and mammals were calculated using the equation shown below.

$$PD = [(C_{\text{food}} \times I_f) + (C_{\text{water}} \times I_w) + (C_{\text{sed}} \times I_{\text{sed}})] \times \text{AUF} / \text{BW} \quad (\text{Equation 1})$$

where: PD = predicted dose from the ingestion of food and water and the incidental ingestion of sediment (mg/kg/day)

C_{food} = contaminant concentration in food (mg/kg)

I_f = food ingestion rate (kg/day)

C_{water} = contaminant concentration in water (mg/L)

I_w = water ingestion rate (L/day)

C_{sed} = contaminant concentration in sediment (mg/kg)

I_{sed} = sediment ingestion rate (kg/day)

AUF = area use factor (portion of home range that overlaps Site 3)

BW = weight of receptor (kg)

REPRESENTATIVE RECEPTORS AND EXPOSURE FACTORS

The mink (*Mustela vison*) was used to represent mammals that prey upon fish and invertebrates in water bodies near Site 3. Birds that prey on fish and invertebrates were represented by the green heron (*Butorides virescens*). These species have a high probability of exposure to surface water and sediment contaminants based on their diet and habitat preferences. The selected species are assumed to be representative of other species within the same trophic group or guild and represent the groups of organisms specified in the assessment endpoints. Information regarding these representative receptors is presented below and in Table E-1. Values for body weight, food consumption, and water consumption were taken preferentially from the *Wildlife Exposure Factors Handbook* (USEPA, 1993). Table E-2 presents the values for body weight, food and water consumption, and incidental sediment ingestion that were used in the food chain model (Equation 1), and was derived from Table E-1.

Mink

The mink is the most abundant and widespread carnivorous mammal in North America. Mink are found in freshwater and brackish coastal marshes, wetlands, swamps, and along the edges of rivers, streams, lakes, lakes, and ditches (USEPA, 1993). They are never found far from water (Lowery, 1974). Mink tend to use brushy or wooded cover adjacent to water where prey is abundant. Mink den in cavities in tree roots, brush piles, rock piles, logjams, or bank burrows of other animals, particularly muskrats. Mink are largely nocturnal but may move or feed during crepuscular (twilight) periods or during cloudy daylight conditions (USEPA, 1993).

Mink are carnivorous opportunistic predators, taking whatever prey is abundant. They feed on fish, crustaceans, and amphibians in aquatic habitats. Mammals are the most important prey in nearby terrestrial habitats where mink prey especially on mice, rats, and rabbits, and also birds, reptiles, and insects (Lowery, 1974; USEPA, 1993).

Mean body weight values for adult wild mink (non-farm raised) were 1.040 kg (male, summer), 1.233 kg (male, fall), 0.550 kg (female, summer), and 0.586 kg (female, fall) in studies summarized in USEPA's *Wildlife Exposure Factors Handbook* (1993). Because female mink are especially sensitive to COPCs such as Aroclor, mink body weight and food ingestion values in the Site 3 ecological risk assessment were based on female data. Therefore, the BW term in Equation 1 was 0.550 kg in the conservative scenario and 0.568 kg (average female summer and fall) in the average scenario (Tables E-1 and E-2).

Food ingestion rates for mink ranged from 0.12 to 0.22 g/g body weight/day (USEPA, 1993). Food ingestion in the conservative scenario (0.0678 kg/day; Table E-2) was derived by multiplying the maximum food ingestion rate (0.22 g/g body weight/day) by the maximum body weight (1.233 kg), then multiplying by 0.25 to convert the ingestion rate from a wet-weight value to a dry-weight value, based on a 75-percent moisture content in fish (Sample, et al., 1997). Food ingestion in the average scenario (0.0227 kg/day; Table E-2) was derived by multiplying the female food ingestion rate (0.16 g/g body weight/day) by the average female body weight (0.568 kg; Table E-2), then multiplying by 0.25 to convert the ingestion rate from a wet-weight value to a dry-weight value.

Water ingestion rates for mink ranged from 0.028 to 0.11 g/g body weight/day (USEPA, 1993). Water ingestion in the conservative scenario (0.1356 L/day; Table E-2) was derived by multiplying the maximum water ingestion rate (0.11 g/g body weight/day) by the maximum body weight (1.233 kg). Water ingestion rate in the less conservative scenario (0.0392 L/day; Table E-2) was derived by multiplying the average female water ingestion rate (0.069 g/g body weight/day) by the average female body weight (0.568 kg).

The two incidental sediment ingestion rates in Table E-2 (0.0064 kg/day and 0.0021 kg/day) were calculated by multiplying the two food ingestion rates (0.0678 kg/day and 0.0227 kg/day) by incidentally ingested sediment (9.4 percent of diet). The 9.4 percent value is based on the incidental soil/sediment ingestion rate of the raccoon (Beyer, et al., 1994), which also forages on aquatic organisms, because sediment ingestion data were not available for the mink.

Green Heron

The green heron is a common bird in wetland thickets throughout the eastern United States. It is typically a bird of swampy thickets where it forages in both fresh and salt water, especially along forested margins of ponds, lakes, rivers, streams, marshes, and swamps. It prefers thick vegetation but will feed in the open when food is available. Small fish are the primary prey, but green herons also consume insects and a variety of aquatic invertebrates. Breeding populations in Mississippi are non-migratory (Davis and Kushlan, 1994). The green heron would undoubtedly forage in water bodies near Site 3, and its small size relative to other wading birds makes it a good representative of other bird species that prey on aquatic and benthic organisms (a low body weight is usually associated with high food intake per unit body weight).

Data for the green heron were not included in USEPA's *Wildlife Exposure Factors Handbook* (USEPA, 1993), so data were obtained elsewhere. The mean adult body weight of 34 green herons in Florida was 212 g (Dunning, 1993). Minimum and maximum body weights were not

provided, but the standard deviation was 5.92 g (Dunning, 1993). A value of 0.200 kg was used as the BW term in Equation 1 for the conservative scenario (Table E-2). This value is the mean minus two standard deviations from Dunning's data. The BW term in Equation 1 for the average scenario was the mean (0.212 kg) from Dunning's data.

Food ingestion rates for the green heron were not available. Nagy (2001) provided allometric equations for several orders of birds but not for Ciconiiformes (herons). Dry weight food ingestion in the conservative scenario (0.031 kg/day; Table E-2) was derived using the Nagy (2001) equation for "marine birds" based on a 0.224 kg bird. The 0.224 kg body weight value is the mean plus 2 standard deviations from Dunning's (1993) green heron data (see paragraph immediately above); this value would approximate the 98th percentile, and thus, represents a conservative approach. Dry weight food ingestion in the average scenario (0.030 kg/day; Table E-2) was derived using the Nagy (2001) equation for marine birds based on a 0.212 kg bird, which is the mean body weight value from Dunning's (1993) green heron data.

Water ingestion rates for the green heron were not available. Water ingestion in the conservative scenario (0.022 L/day; Table E-2) was derived using equation 3-15 from the *Wildlife Exposure Factors Handbook* (USEPA, 1993) for a 0.224 kg bird. Water ingestion in the average scenario (0.021 L/day; Table E-2) was derived using equation 3-15 from the *Wildlife Exposure Factors Handbook* (USEPA, 1993) for a 0.212 kg bird.

Sediment ingestion data for piscivorous birds were not available in the literature. A sediment ingestion rate of 5 percent for piscivorous birds was used in Equation 1. Unlike shorebirds, herons do not probe the sediment. Green herons and other wading birds typically capture prey with a darting stroke, grasping or spearing with the bill (Davis and Kushlan, 1994). Similarly, piscivorous birds such as the belted kingfisher and osprey capture prey primarily from the water column rather than by probing on or near the sediment substrate. Therefore, an assumed value of 5 percent for incidental sediment ingestion is probably a very conservative estimate for the green heron as well as for other piscivorous birds. The two sediment ingestion rates in Table E-2 (0.0016 kg/day and 0.0015 kg/day) were calculated by multiplying the two food ingestion rates (0.031 kg/day and 0.030 kg/day) by 0.05, assuming that incidentally ingested sediment is 5 percent of the diet.

CHEMICAL CONCENTRATIONS IN FOOD ITEMS

Chemical concentrations in food items (the “ C_{food} ” term in Equation 1) were calculated using biota sediment accumulation factors (BSAFs), which are shown in Table E-3.

Chemical concentrations of organic compounds in food items of piscivorous birds and mammals was estimated using the following equation (USEPA, 2004):

$$C_f = \text{BSAF}(C_s/f_{\text{oc}})f_l \quad (\text{Equation 2})$$

where:

- C_f = chemical concentration in food (mg/kg)
- C_s = chemical concentration in sediment (mg/kg)
- BSAF = biota-sediment accumulation factor (ratio of the concentration of a chemical in tissue, normalized to lipid, to the concentration of the chemical in surface sediment, normalized to organic carbon)
- f_{oc} = total organic carbon (TOC) content of sediment expressed as a decimal fraction
- f_l = organism lipid content expressed as a decimal fraction

BSAFs for organic compounds were obtained from *The Incidence and Severity of Sediment Contamination in Surface Waters of the United States, National Sediment Quality Survey: Second Edition* (USEPA, 2004).

TOC was not measured in sediment samples collected from Site 3 in October 2006, but TOC data for are available from previous studies of Canal No. 1 sediments. The TOC content in three sediment samples collected from the canal immediately adjacent to Site 3 ranged from 10,000 mg/kg to 28,000 mg/kg with an average of 16,000 mg/kg, or 1.6 percent (HLA, 1999). A TOC value of 1.6 percent (0.016) was used to represent the f_{oc} term in Equation 2 for organic compounds.

A lipid content of 3 percent (0.03) is often used for assessing human health effects from the consumption of contaminated fish (USEPA, 2004); this value was divided by 0.25 to convert the lipid content from a wet-weight value to a dry-weight value (0.12), based on a 75 percent moisture content in fish (Sample et al., 1997). Thus, 0.12 was used to represent f_l in Equation 2 for organic compounds.

Sediment-to-fish BSAFs are not available for metals, so sediment-to-aquatic invertebrate BSAFs from ORNL (1998) were used to estimate tissue concentrations of metals (arsenic, copper, and lead) in food items of piscivorous birds and mammals. The BSAFs for metals are not normalized to lipids or TOC, so concentrations of metals in aquatic and benthic invertebrates were estimated by multiplying each COPC's sediment concentration by its associated BSAF.

AREA USE FACTORS

In ecological risk assessments, the home range size of a representative receptor can be used to determine the proportion of time that an individual animal is expected to contact contaminated environmental media. Home range is defined as the geographic area encompassed by an animal's activities (except migration) over a specified time. The home range of each representative receptor was assumed to be equal in size to Site 3 in both the conservative and average initial estimates of ingested doses (i.e., AUF in Equation 1 = 1.0). Due to the size of Site 3, this assumption is probably overly conservative for piscivorous receptors such as the green heron and mink.

ECOLOGICAL EFFECTS EVALUATION

Potential effects to representative piscivorous birds and mammals were evaluated by comparing the modeled ingested doses to threshold oral toxicity reference values (TRVs), which are doses associated with adverse effects on growth, survival, or reproduction. Because TRVs for the specific representative receptors used herein (mink and green heron) were usually not available, toxicity data from laboratory species were extrapolated to the representative receptor species. No-observed-adverse-effects levels (NOAELs) and lowest-observed-adverse-effects levels (LOAELs) were used to provide a range of risks. TRVs used in this ecological risk assessment and their sources are presented in Table E-4 of this appendix.

TRVs were preferentially obtained from USEPA's Eco-SSL documents, in which numerous toxicity studies were evaluated. The TRVs for DDT, arsenic, copper, and lead shown in Table E-4 represent the geometric means of NOAEL and LOAEL data for growth and reproduction from the Eco-SSL documents (USEPA, 2005a; b; 2007a; b). TRVs for Aroclors, BHC, and chlordane were not included in Eco-SSL documents, so TRVs for these COPCs were obtained from an Oak Ridge National Laboratory report (Sample et al., 1996) that compiled toxicity data from several sources.

The ratio of the modeled dose to the TRV is called the hazard quotient (HQ). An HQ less than 1.0 in the food-chain modeling (in the conservative scenario and using the NOAEL as the TRV) indicates that risk to the representative piscivorous receptor is unlikely. A food chain HQ of greater than 1.0 indicates that potential risks to ecological receptors is possible, and the chemical is further evaluated.

Calculation spreadsheets for the representative receptors are presented in Tables E-5, E-6, E-7, and E-8 of this appendix. A step-by-step example of how food chain HQs were calculated is provided as Appendix E-9.

REFERENCES
APPENDIX E (TEXT AND TABLES)

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TABLE E-1

DERIVATION OF BODY WEIGHT, FOOD INTAKE, AND WATER INTAKE FACTORS FOR REPRESENTATIVE WILDLIFE RECEPTORS
 SITE 3 NORTHWEST LANDFILL/BURNING PIT
 NCBC GULFPORT
 GULFPORT, MISSISSIPPI

Species/Factor	Age/Sex/Season ^a	Value	Derivation of Factors Used in Food Chain Modeling		
Mink^b					
Body Weight (g)	A M summer	1040	Minimum Value	0.550 kg	
	A M fall	1233	Maximum Value	1.233 kg	
	A F summer	550	Overall average	0.852 kg	
	A F fall	586	Average female	0.568 kg	
Food Ingestion Rate (g/g-day)	A M summer	0.13	Conservative scenario:	0.0678 kg/day	Maximum ingestion rate (0.22 g/g/day) × maximum body weight (1.233 kg) × 0.25 ^c
	A M winter	0.12			
	A F winter	0.16	Less conservative scenario:	0.0227 kg/day	Female ingestion rate (0.16 g/g/day) × average female body weight (0.568 kg) × 0.25 ^c
	A M year-round	0.22			
Water Ingestion Rate (g/g-day)	A F	0.11	Average female	0.069 g/g/day	
	A M	0.099	Conservative scenario:	0.1356 L/day	Maximum ingestion rate (0.11 g/g/day) × maximum body weight (1.233 kg)
	A F	0.028	Less conservative scenario:	0.03919 L/day	Average female ingestion rate (0.069 g/g/day) × average female body weight (0.568 kg)
Green Heron^d					
Body Weight (g)	AB	212	Mean of 34 adults from Florida = 212 g, standard deviation = 5.92 g (Dunning, 1993)		
			Conservative scenario:	0.200 kg	Mean minus 2 standard deviations (Dunning, 1993)
			Less conservative scenario:	0.212 kg	Mean (Dunning, 1993)
Food Ingestion Rate (g/g-day)	-	-	Conservative scenario:	0.031 kg/day	Using allometric equation from Nagy (2001) for 0.224 kg marine bird (0.224 kg = mean plus 2 standard deviations from Dunning (1993) green heron data)
			Less conservative scenario:	0.030 kg/day	Using allometric equation from Nagy (2001) for 0.212 kg marine bird
Water Ingestion Rate (L/day)	-	-	Conservative scenario:	0.022 L/day	Using equation 3-15 from USEPA (1993) for 0.224 kg bird
			Less conservative scenario:	0.021 L/day	Using equation 3-15 from USEPA (1993) for 0.212 kg bird

Notes:

a A=adult, M=male, F=female, B=both sexes

b Data from Wildlife Exposure Factors Handbook (USEPA, 1993).

c Food ingestion was multiplied by 0.25 (based on 75 percent moisture content in fish) to convert to dry weight ingestion rate.

d Green heron data not available in Wildlife Exposure Factors Handbook (USEPA, 1993). Values obtained from other sources as shown.

TABLE E-2

FOOD CHAIN EXPOSURE FACTORS FOR PISCIVOROUS WILDLIFE
 SITE 3 NORTHWEST LANDFILL/BURNING PIT
 NCBC GULFPORT
 GULFPORT, MISSISSIPPI

Species/Exposure Inputs	Conservative Scenario ⁽¹⁾		Average Scenario ⁽¹⁾	
	Values	Units	Values	Units
<i>Mink</i>				
Body Weight	0.550	kg	0.568	kg
Food Ingestion Rate ⁽²⁾	0.0678	kg/day	0.0227	kg/day
Water Ingestion Rate	0.1356	L/day	0.0392	L/day
Sediment Ingestion Rate ⁽³⁾	0.0064	kg/day	0.0021	kg/day
<i>Green Heron</i>				
Body Weight	0.200	kg	0.212	kg
Food Ingestion Rate ⁽²⁾	0.031	kg/day	0.030	kg/day
Water Ingestion Rate	0.022	L/day	0.021	L/day
Sediment Ingestion Rate ⁽³⁾	0.0016	kg/day	0.0015	kg/day

(1)The derivation of values in this table is presented in Table F-1.

(2) Food ingestion rates are dry-weight values.

(3) Sediment ingestion rates were calculated by multiplying the food ingestion (kg/day) by the proportion of the diet comprised of incidentally ingested sediment (9.4% for mink, 5% for green heron).

**TABLE E-3
BIOTA SEDIMENT ACCUMULATION FACTORS (BSAFs)
SITE 3 NORTHWEST LANDFILL/BURNING PIT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Chemical	BSAFs		Source
	Conservative ⁽¹⁾	Average ⁽¹⁾	
4,4'-DDE	7.7	7.7	USEPA, 2004
4,4'-DDT	1.67	1.67	USEPA, 2004
Total DDT	7.7	7.7	USEPA, 2004
alpha-BHC	1.8	1.8	USEPA, 2004
delta-BHC	1.8	1.8	USEPA, 2004
alpha-Chlordane	4.77	4.77	USEPA, 2004
gamma-Chlordane	2.22	2.22	USEPA, 2004
Aroclor-1254	1.85	1.85	USEPA, 2004
Aroclor-1260	1.85	1.85	USEPA, 2004
Total Aroclor	1.85	1.85	USEPA, 2004
Arsenic	0.69	0.143	ORNL, 1998
Copper	5.25	1.556	ORNL, 1998
Lead	0.607	0.071	ORNL, 1998

Notes:

1 Conservative and average refer to the exposure scenarios for which the BSAFs were used. For inorganics, conservative value is 90th percentile from ORNL (1998) and average value is median value from ORNL (1988). Only a single BSAF was available for Aroclor-1260 in USEPA (2004); thus, the same BSAF value was used for conservative and average scenarios.

**TABLE E-4
TOXICITY REFERENCE VALUES (TRVs)
SITE 3 NORTHWEST LANDFILL/BURNING PIT
NCBC GULFPORT
GULFPORT, MISSISSIPPI**

Chemical	Concentration (mg/kg/day)	Endpoint	Effect	Study Duration	Species	Primary Reference ⁽¹⁾	Source of Rf
Organics							
Aroclor-1254 ⁽²⁾	1.8	LOAEL	reproduction	17 weeks	pheasant	Dahlgren et al., 1972	Sample et al.,
Aroclor-1254 ⁽²⁾	0.14	NOAEL	reproduction	4.5 months	mink	Aulerich & Ringer, 1977	Sample et al.,
Aroclor-1254 ⁽²⁾	0.69	LOAEL	reproduction	4.5 months	mink	Aulerich & Ringer, 1977	Sample et al.,
BHC (mixed isomers) ⁽³⁾	0.14	LOAEL	reproductive	331 days	mink	Bleavins et al., 1984	Sample et al.,
BHC (mixed isomers) ⁽³⁾	0.563	NOAEL	reproductive	90 days	Japanese quail	Vos et al., 1971	Sample et al.,
BHC (mixed isomers) ⁽³⁾	2.25	LOAEL	reproductive	90 days	Japanese quail	Vos et al., 1971	Sample et al.,
Chlordane ⁽⁴⁾	2.14	NOAEL	mortality	84 days	red-winged blackbird	Stickel et al., 1983	Sample et al.,
Chlordane ⁽⁴⁾	10.7	LOAEL	mortality	84 days	red-winged blackbird	Stickel et al., 1983	Sample et al.,
Chlordane ⁽⁴⁾	4.58	NOAEL	reproduction	> 1 year	mouse	WHO, 1984	Sample et al.,
Chlordane ⁽⁴⁾	9.16	LOAEL	reproduction	> 1 year	mouse	WHO, 1984	Sample et al.,
DDT ⁽⁵⁾	0.227	NOAEL	reproduction & growth	chronic ⁽⁶⁾	various birds ⁽⁶⁾	-	USEPA, 2007
DDT ⁽⁵⁾	2.70	LOAEL	reproduction & growth	chronic ⁽⁶⁾	various birds ⁽⁶⁾	-	USEPA, 2007
DDT ⁽⁵⁾	0.147	NOAEL	reproduction & growth	chronic ⁽⁶⁾	various mammals ⁽⁶⁾	-	USEPA, 2007
DDT ⁽⁵⁾	5.56	LOAEL	reproduction & growth	chronic ⁽⁶⁾	various mammals ⁽⁶⁾	-	USEPA, 2007
Inorganics							
Arsenic	2.24	NOAEL	reproduction & growth	chronic ⁽⁶⁾	various birds ⁽⁶⁾	-	USEPA, 200E
Arsenic	4.51	LOAEL	reproduction & growth	chronic ⁽⁶⁾	various birds ⁽⁶⁾	-	USEPA, 200E
Arsenic	1.04	NOAEL	reproduction & growth	chronic ⁽⁶⁾	various mammals ⁽⁶⁾	-	USEPA, 200E
Arsenic	4.55	LOAEL	reproduction & growth	chronic ⁽⁶⁾	various mammals ⁽⁶⁾	-	USEPA, 200E
Copper	5.82	NOAEL	reproduction & growth	chronic ⁽⁶⁾	various mammals ⁽³⁾	-	USEPA, 2007
Copper	81.42	LOAEL	reproduction & growth	chronic ⁽⁶⁾	various mammals ⁽³⁾	-	USEPA, 2007
Copper	4.05	NOAEL	reproduction & growth	chronic ⁽⁶⁾	various birds ⁽³⁾	-	USEPA, 2007
Copper	34.76	LOAEL	reproduction & growth	chronic ⁽⁶⁾	various birds ⁽⁶⁾	-	USEPA, 2007
Lead	4.7	NOAEL	reproduction & growth	chronic ⁽⁶⁾	various mammals ⁽⁶⁾	-	USEPA, 200E
Lead	186.4	LOAEL	reproduction & growth	chronic ⁽⁶⁾	various mammals ⁽³⁾	-	USEPA, 200E
Lead	1.63	NOAEL	reproduction & growth	chronic ⁽⁶⁾	various birds ⁽³⁾	-	USEPA, 200E
Lead	44.6	LOAEL	reproduction & growth	chronic ⁽⁶⁾	various birds ⁽³⁾	-	USEPA, 200E

Footnotes:

- (1) See Sample *et al.* (1996) for full citations of primary references cited in the Sample *et al.* (1996) document.
- (2) Aroclor-1254 used as a surrogate for Aroclor-1260 and total Aroclors. A NOAEL was not derived in the Dahlgren et al (1972) pheasant study for Aroclor-1254, so the NOAEL used in the Site 3 food chain evaluation was estimated by dividing the LOAEL by 10.
- (3) BHC mixed isomers used as a surrogate for alpha-BHC and delta-BHC. A NOAEL was not derived in the Bleavins et al (1984) mink study for BHC mixed isomers, so the NOAEL used in the Site 3 food chain evaluation was estimated by dividing the LOAEL by 10.
- (4) Chlordane used as a surrogate for alpha-Chlordane and gamma-Chlordane
- (5) DDT used as a surrogate for 4,4'-DDE, 4,4'-DDT, and total DDT.
- (6) Bird and mammal TRVs from USEPA' s Eco-SSL documents represent the geometric means of numerous studies of various durations and species.

TABLE E-5
FOOD CHAIN HAZARD QUOTIENTS FOR PISCIVOROUS MAMMALS REPRESENTED BY THE MINK
CONSERVATIVE SCENARIO
SITE 3
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Chemical	Maximum Sediment Concentration (mg/kg)	Maximum Surface Water Concentration (mg/L)	BSAF ⁽¹⁾	Estimated Fish or Invertebrate Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL HQ	LOAEL HQ
4,4'-DDE	0.0037	0.0	7.7	0.2137	0.02638	0.147	5.56	0.18	0.005
4,4'-DDT	0.0098	0.0	1.67	0.1227	0.01525	0.147	5.56	0.10	0.003
Total DDT	0.0135	0.0	7.7	0.7796	0.09626	0.147	5.56	0.65	0.02
alpha-BHC	0.0021	0.0	1.8	0.0284	0.00352	0.014	0.14	0.25	0.03
delta-BHC	0.0020	0.0	1.8	0.0270	0.00335	0.014	0.14	0.24	0.02
alpha-Chlordane	0.0033	0.0	4.77	0.1181	0.01459	4.58	9.16	0.00	0.002
gamma-Chlordane	0.0021	0.0	2.22	0.0350	0.00433	4.58	9.16	0.001	0.0005
Aroclor-1254	0.0860	0.0	1.85	1.1933	0.14810	0.14	0.69	1.06	0.21
Aroclor-1260	0.1300	0.0	1.85	1.8038	0.22387	0.14	0.69	1.60	0.32
Total Aroclors	0.2160	0.0	1.85	2.9970	0.37196	0.14	0.69	2.66	0.54
Arsenic	13.2	0.0	0.69	9.108	1.27637	1.04	4.55	1.23	0.28
Copper	9.3	0.0155	5.25	48.825	6.13083	5.82	81.42	1.05	0.08
Lead	22.0	0.0019	0.607	13.354	1.90265	4.7	186.4	0.40	0.01

Notes:

Cells are shaded if the hazard quotient (HQ) is greater than 1.0

$$\text{Dose} = [(I_f \times C_f) + (I_s \times C_s) + (I_w \times C_w)] / \text{BW}$$

Body Weight = (BW) 0.550 kg

Food Ingestion Rate = (I_f) 0.0678 kg/day

Water Ingestion Rate = (I_w) 0.1356 L/day

Sediment Ingestion Rate = (I_s) 0.0064 kg/day

Average TOC = 1.6 %

C_f = Contaminant concentration in food

C_s = Contaminant concentration in sediment

C_w = Contaminant concentration in water

Lipids (fish) = 12.0 % (dry weight value based on 3.0% wet weight)

⁽¹⁾ BSAF = Biota-sediment-accumulation factor. BSAFs for organic chemicals represent sediment to fish biotransfer factors. Sediment to fish BSAFs were not available for inorganics, and thus, BSAFs for inorganics represent sediment to invertebrate biotransfer factors (see text).

TABLE E-6
FOOD CHAIN HAZARD QUOTIENTS FOR PISCIVOROUS MAMMALS REPRESENTED BY THE MINK
AVERAGE SCENARIO
SITE 3
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Chemical	Average Sediment Concentration (mg/kg)	Average Surface Water Concentration (mg/L)	BSAF ⁽¹⁾	Estimated Fish or Invertebrate Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL HQ	LOAEL HQ
4,4'-DDE	0.002205	0.0	7.7	0.1273	0.00510	0.147	5.56	0.03	0.001
4,4'-DDT	0.003325	0.0	1.67	0.0416	0.00168	0.147	5.56	0.01	0.0003
Total DDT	0.004525	0.0	7.7	0.2613	0.01046	0.147	5.56	0.07	0.002
alpha-BHC	0.001315	0.0	1.8	0.0178	0.00071	0.014	0.14	0.05	0.01
delta-BHC	0.001260	0.0	1.8	0.0170	0.00068	0.014	0.14	0.05	0.005
alpha-Chlordane	0.001405	0.0	4.77	0.0503	0.00201	4.58	9.16	0.0004	0.0002
gamma-Chlordane	0.001280	0.0	2.22	0.0213	0.00086	4.58	9.16	0.0002	0.0001
Aroclor-1254	0.024650	0.0	1.85	0.3420	0.01376	0.14	0.69	0.10	0.02
Aroclor-1260	0.032350	0.0	1.85	0.4489	0.01806	0.14	0.69	0.13	0.03
Total Aroclors	0.049350	0.0	1.85	0.6847	0.02755	0.14	0.69	0.20	0.04
Arsenic	4.90	0.0	0.143	0.701	0.04612	1.04	4.55	0.04	0.01
Copper	4.30	0.0048	1.556	6.691	0.28363	5.82	81.42	0.05	0.003
Lead	9.98	0.0012	0.071	0.709	0.06530	4.7	186.4	0.01	0.0004

Notes:

Cells are shaded if the hazard quotient (HQ) is greater than 1.0

$$\text{Dose} = [(I_f \times C_f) + (I_s \times C_s) + (I_w \times C_w)] / \text{BW}$$

Body Weight = (BW) 0.568 kg
 Food Ingestion Rate = (I_f) 0.0227 kg/day
 Water Ingestion Rate = (I_w) 0.0392 L/day
 Sediment Ingestion Rate = (I_s) 0.0021 kg/day
 Average TOC = 1.6 %

C_f = Contaminant concentration in soil
 C_s = Contaminant concentration in sediment
 C_w = Contaminant concentration in water

Lipids (fish) = 12.0 % (dry weight value based on 3.0% wet weight)

⁽¹⁾ BSAF = Biota-sediment-accumulation factor. BSAFs for organic chemicals represent sediment to fish biotransfer factors. Sediment to fish BSAFs were not available for inorganics, and thus, BSAFs for inorganics represent sediment to invertebrate biotransfer factors (see text).

TABLE E-7
FOOD CHAIN HAZARD QUOTIENTS FOR PISCIVOROUS BIRDS REPRESENTED BY THE GREEN HERON
CONSERVATIVE SCENARIO
SITE 3
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Chemical	Maximum Sediment Concentration (mg/kg)	Maximum Surface Water Concentration (mg/L)	BSAF ⁽¹⁾	Estimated Fish or Invertebrate Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL HQ	LOAEL HQ
4,4'-DDE	0.0037	0.0	7.7	0.2137	0.0331	0.227	2.7	0.15	0.01
4,4'-DDT	0.0098	0.0	1.67	0.1227	0.0191	0.227	2.7	0.08	0.01
Total DDT	0.0135	0.0	7.7	0.7796	0.1209	0.227	2.7	0.53	0.04
alpha-BHC	0.0021	0.0	1.8	0.0284	0.0044	0.563	2.25	0.01	0.002
delta-BHC	0.0020	0.0	1.8	0.0270	0.0042	0.563	2.25	0.01	0.002
alpha-Chlordane	0.0033	0.0	4.77	0.1181	0.0183	2.14	10.7	0.01	0.002
gamma-Chlordane	0.0021	0.0	2.22	0.0350	0.0054	2.14	10.7	0.003	0.001
Aroclor-1254	0.0860	0.0	1.85	1.1933	0.1856	0.18	1.8	1.03	0.10
Aroclor-1260	0.1300	0.0	1.85	1.8038	0.2806	0.18	1.8	1.56	0.16
Total Aroclors	0.2160	0.0	1.85	2.9970	0.4663	0.18	1.8	2.59	0.26
Arsenic	13.2	0.0	0.69	9.108	1.5173	2.24	4.51	0.68	0.34
Copper	9.3	0.01550	5.25	48.825	7.6440	4.05	34.76	1.89	0.22
Lead	22.0	0.00190	0.607	13.354	2.2461	1.63	44.6	1.38	0.05

Notes:

Cells are shaded if the hazard quotient (HQ) is greater than 1.0

$$\text{Dose} = [(I_f \times C_f) + (I_s \times C_s) + (I_w \times C_w)] / \text{BW}$$

Body Weight = (BW)

0.200 kg

Cf = Contaminant concentration in fish

Food Ingestion Rate = (If)

0.031 kg/day

Cs = Contaminant concentration in sediment

Water Ingestion Rate = (Iw)

0.022 L/day

Cw = Contaminant concentration in water

Sediment Ingestion Rate = (Is)

0.0016 kg/day

Lipids (fish) =

12.0 % (dry weight value based on 3.0% wet weight)

⁽¹⁾BSAF = Biota-sediment-accumulation factor. BSAFs for organic chemicals represent sediment to fish biotransfer factors. Sediment to fish BSAFs were not available for inorganics, and thus, BSAFs for inorganics represent sediment to invertebrate biotransfer factors (see text).

TABLE E-8
FOOD CHAIN HAZARD QUOTIENTS FOR PISCIVOROUS BIRDS REPRESENTED BY THE GREEN HERON
AVERAGE SCENARIO
SITE 3
NCBC GULFPORT, GULFPORT, MISSISSIPPI

Chemical	Average Sediment Concentration (mg/kg)	Average Surface Water Concentration (mg/L)	BSAF ⁽¹⁾	Estimated Fish or Invertebrate Concentration (mg/kg)	Dose (mg/kg/day)	NOAEL (mg/kg/day)	LOAEL (mg/kg/day)	NOAEL HQ	LOAEL HQ
4,4'-DDE	0.002205	0.0	7.7	0.1273	0.0180	0.227	2.7	0.08	0.01
4,4'-DDT	0.003325	0.0	1.67	0.0416	0.0059	0.227	2.7	0.026	0.002
Total DDT	0.004525	0.0	7.7	0.2613	0.0370	0.227	2.7	0.163	0.014
alpha-BHC	0.001315	0.0	1.8	0.0178	0.0025	0.563	2.25	0.004	0.001
delta-BHC	0.001260	0.0	1.8	0.0170	0.0024	0.563	2.25	0.004	0.001
alpha-Chlordane	0.001405	0.0	4.77	0.0503	0.0071	2.14	10.7	0.003	0.001
gamma-Chlordane	0.001280	0.0	2.22	0.0213	0.0030	2.14	10.7	0.001	0.0003
Aroclor-1254	0.024650	0.0	1.85	0.3420	0.0486	0.18	1.8	0.270	0.027
Aroclor-1260	0.032350	0.0	1.85	0.4489	0.0637	0.18	1.8	0.354	0.035
Total Aroclors	0.049350	0.0	1.85	0.6847	0.0972	0.18	1.8	0.540	0.054
Arsenic	4.90	0.0	0.143	0.701	0.134	2.24	4.51	0.06	0.03
Copper	4.30	0.0048	1.556	6.691	0.978	4.05	34.76	0.24	0.03
Lead	9.98	0.0012	0.071	0.709	0.171	1.63	44.6	0.10	0.004

Notes:

Cells are shaded if the hazard quotient (HQ) is greater than 1.0

$$\text{Dose} = [(I_f \times C_f) + (I_s \times C_s) + (I_w \times C_w)] / \text{BW}$$

Body Weight = (BW)

0.212 kg

Cf = Contaminant concentration in soil

Food Ingestion Rate = (If)

0.030 kg/day

Cs = Contaminant concentration in sediment

Water Ingestion Rate = (Iw)

0.021 L/day

Cw = Contaminant concentration in water

Sediment Ingestion Rate = (Is)

0.0015 kg/day

Lipids (fish) =

12.0 % (dry weight value based on 3.0% wet weight)

⁽¹⁾ BSAF = Biota-sediment-accumulation factor. BSAFs for organic chemicals represent sediment to fish biotransfer factors. Sediment to fish BSAFs were not available for inorganics, and thus, BSAFs for inorganics represent sediment to invertebrate biotransfer factors (see text).

APPENDIX E-9
EXAMPLE CALCULATION OF HAZARD QUOTIENT FOR THE MINK
USING THE MAXIMUM SEDIMENT CONCENTRATION OF AROCLOR-1254
CONSERVATIVE SCENARIO

The predicted dose for representative receptors =

$$PD = [(C_{\text{food}} \times I_f) + (C_{\text{water}} \times I_w) + (C_{\text{sed}} \times I_{\text{sed}})] \times \text{AUF} / \text{BW} \quad (\text{Equation 1})$$

where: PD = predicted dose from the ingestion of food and water and the incidental ingestion of sediment (mg/kg/day)
 C_{food} = contaminant concentration in food (mg/kg)
 I_f = food ingestion rate (kg/day)
 C_{water} = contaminant concentration in water (mg/L)
 I_w = water ingestion rate (L/day)
 C_{sed} = contaminant concentration in sediment (mg/kg)
 I_{sed} = sediment ingestion rate (kg/day)
AUF = area use factor (portion of home range that overlaps Site 3)
BW = weight of receptor (kg)

Chemical concentrations of *organic compounds* (see note below) in food items (C_{food}) of the mink and green heron were estimated using the following equation (chemical concentrations :

$$C_{\text{food}} = \text{BSAF}(C_s/f_{\text{oc}})f_i \quad (\text{Equation 2})$$

where:
 C_{food} = chemical concentration in food (mg/kg)
 C_s = chemical concentration in sediment (mg/kg)
BSAF = biota-sediment accumulation factor
 f_{oc} = total organic carbon (TOC) content of sediment expressed as a decimal fraction
 f_i = organism lipid content expressed as a decimal fraction

Note: Equation 2 was used to derive estimated concentrations of *organic compounds* in food items. BSAFs for metals are not normalized to lipids or TOC, so concentrations of *metals* (arsenic, copper, and lead) were estimated by multiplying each metal's sediment concentration by its associated BSAF.

BSAF for Aroclor-1254 = 1.85 (Table E-3)

C_s = 86 $\mu\text{g}/\text{kg}$ (Table 7-2), which equals 0.086 mg/kg (Table E-5)

f_{oc} = 1.6 percent (average TOC, see Appendix F text) = 0.016

f_i = 3 percent wet weight, or 12 percent dry weight (discussed in Appendix F text) = 0.12

Using these values, $C_{\text{food}} = (1.85 \times 0.086 \text{ mg/kg} \times 0.12) \div 0.016 = 1.19325 \text{ mg/kg}$; this is the estimated concentration in food (fish or aquatic/benthic invertebrates) (Table E-5).

$I_f = 0.0678 \text{ kg/day}$ (Conservative scenario, Table E-2)

$C_{\text{sed}} = 86 \mu\text{g}/\text{kg} = 0.086 \text{ mg/kg}$ (Tables 7-2 and E-5)

$I_{\text{sed}} = 0.0064 \text{ kg/day}$ (Table E-2)

C_{water} and I_w are not applicable here, since Aroclor-1254 was not detected in water
AUF assumed = 1.0.

BW = 0.550 kg (Conservative scenario, Table E-2)

Using the above values in Equation 1,

Predicted dose = $[(1.19325 \text{ mg/kg} \times 0.0678 \text{ kg/day}) + (0.086 \text{ mg/kg} \times 0.0064 \text{ kg/day})] \div 0.550 \text{ kg}$
= 0.14810 mg/kg/day (Table E-5)

The mammal NOAEL for Aroclor-1254 is 0.14 mg/kg/day (Table E-4).

Thus, the NOAEL-based HQ = $0.14810 \text{ mg/kg/day} \div 0.14 \text{ mg/kg/day} = 1.0578 \approx 1.1$ (Tables E-5 and 7-8).

The mammal LOAEL for Aroclor-1254 is 0.69 mg/kg/day (Table E-4).

Thus, the LOAEL-based HQ = $0.14810 \text{ mg/kg/day} \div 0.69 \text{ mg/kg/day} = 0.2146 \approx 0.2$ (Tables E-5 and 7-8).