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LETTER REPORT
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1.0 INTRODUCTION

On May 28, 1997, a meeting was held at the North Carolina (NC) Department of Environment and Natural Resources (DENR) Wilmington Regional Offices. The primary purpose of the meeting was to present the information collected during the Remedial Investigation (RI) for Operable Unit (OU) Number (No.) 6, Sites 36, 43, 44, 54, and 86; and to present the preferred groundwater remedial actions (Natural Attenuation) presented within the Feasibility Studies (FS) for Site 36, Site 54, and Site 86.

Along with Baker Environmental, Inc. (Baker), the following regulatory and governing authorities were represented at the May 28, 1997 meeting:

- Atlantic Division, Naval Facilities Engineering Command (LANTDIV)
- Marine Corps Base (MCB), Camp Lejeune, Installation Restoration (IR)
- NC DENR - Superfund Section
- NC DENR - Wilmington Regional Office, Groundwater Section
- NC DENR - Wilmington Regional Office, Surface Water Section

Based upon the RI/FS information that was presented for Sites 36, 54, and 86 and the discussions which proceeded thereafter, it was collectively agreed that the selection of the most appropriate remedial alternative for each of these three sites would best be chosen following the review of additional, site-specific groundwater analytical data. In brief, the placement of additional groundwater monitoring wells were determined for Site 36 (two additional monitoring wells), Site 54 (three additional monitoring wells), and Site 86 (three additional monitoring wells).

The objective of this letter report is to present the analytical results gathered during the post-RI groundwater sampling that was completed for Sites 36, 54, and 86. Following a brief discussion of the processes and environmental conditions/indicators related to natural attenuation, this letter report includes an overview of the RI/FS volatile organic compound (VOC) findings, a description of the newly installed groundwater monitoring wells, post-RI groundwater results, and recommendations for the most appropriate remedial alternative. Sections 2.0, 3.0, and 4.0 present this information for Sites 36, 54, and 86, respectively. Conclusions and overall recommendations for finalization of the FS documents and the most appropriate recommended alternatives are presented in Section 5.0.

1.1 Natural Attenuation

Natural attenuation (NA) is defined as the reduction in mass or concentration of a chemical in groundwater that occurs over time or distance from the source of contamination due to naturally occurring physical, chemical, and biological processes. The non-destructive mechanisms related to NA that may lead to reduction in groundwater concentrations include: dispersion, dilution from recharge, contaminant mass transfer to aquifer solids (sorption), and volatilization. Destructive mechanisms associated with NA result in the mass loss of a contaminant from the system. Biodegradation (aerobic, anaerobic, or cometabolism), abiotic oxidation/reduction reactions, and hydrolysis are all examples of NA destructive mechanisms.

Current NA literature identifies three typical or general plume behaviors including: growing plume (where the source is greater than the attenuation affects of the aquifer), stable plume (where the source of the plume is equal to the attenuation affects of the aquifer), and a shrinking plume (where the affects of NA are greater than the source). The shrinking plume identifies true remediation of a

contaminated aquifer. However, understanding all three of these plume behaviors is important to the successful monitoring and interpretation of the scientific, site-specific data that supports and demonstrates remediation by NA.

Both the advantages and disadvantages of NA should be reviewed and considered on a site-specific basis. Thus, the evaluation of this remediation alternative is no different than the evaluation associated with a pump and treat system, in-well aeration, or air sparging. Although research and studies are underway within the United States to augment or enhance (through injections and groundwater additives) remediation by NA, it occurs under many different conditions without the influence of mankind. Monitoring the progress of NA, however, is the means to document and potentially predict both the attainable cleanup and/or timeframe required within a given aquifer.

The discussions, hereafter, related to NA are based on the assumption that continued monitoring of the contaminant concentrations, along with the collection of certain geochemical and biochemical indicators, will be conducted at a specified time for each individual site. It is anticipated that the defined monitoring programs will most likely be customized as more data is collected and evaluated.

Based on the information collected to date from Sites 36, 54, and 86, collection and evaluation of the following geochemical and biochemical parameters is expected and will be considered part of the remedial actions defined in Sections 2.0, 3.0 and 4.0.

- Dissolved Oxygen (anaerobic pathway indicator)
- Nitrate (substrate for microbial respiration)
- Iron (II) (anaerobic degradation process indicator)
- Sulfate (substrate for microbial respiration)
- Methane/Ethane/Ethene (confirmation of biological transformation of chlorinated solvents)
- Chloride (sample confirmation of same groundwater system)
- Hydrogen (optional; determines terminal electron accepting process)
- Dissolved Organic Carbon (used to classify plume)
- Oxidation-Reduction Potential (ORP; influences [and influenced by] nature of biologically mediated degradation)
- Alkalinity (measures buffering capacity of groundwater)
- pH (aerobic and anaerobic processes are pH sensitive)
- Temperature (well development)
- Conductivity (sample confirmation of same groundwater system)

Evaluation of the volatile concentrations, along with these geochemical and biochemical parameters to be collected during the NA monitoring remedial action, will help to more clearly define the extent and rate of NA, as well as the type of plume behavior for each of the three sites.

2.0 SITE 36 - CAMP GEIGER AREA DUMP

2.1 Summary of the Site 36 Remedial Investigation VOC Results

The horizontal extent of the VOCs detected in the groundwater at Site 36 is primarily limited to the northern portion of the site. Although the RI results of several wells located adjacent and up gradient of this northern area indicated the presence of low levels of 1,2-DCE, the overall up gradient area of

Site 36 is bounded by several wells with groundwater results below detection limits. Based on the results of the VOC detections in groundwater collected during the RI, the VOCs are present above 35 feet below ground surface (bgs). Results of the samples collected from groundwater monitoring well IR36-GW10DW were below detection limits. This well is screened at a depth of 62 to 67 feet bgs, which is located below the Castle Hayne semi-confining layer.

Surficial groundwater at Site 36 flows in the northeastern direction, towards Brinson Creek. Based on this flow pattern and the hydrogeologic conditions, it appears that the groundwater within the surficial aquifer discharges into Brinson Creek. Although the northern portion of the site where the VOCs were detected is situated adjacent to Brinson Creek, the results of the surface water volatile analyses indicated non-detections of volatiles.

The maximum VOC concentrations detected in the groundwater during the Site 36 RI included:

- Trichloroethene (TCE) 97 micrograms per liter ($\mu\text{g/L}$)
- 1,2-Dichloroethene (1,2-DCE) 37 $\mu\text{g/L}$
- Tetrachloroethene (PCE) 2 J $\mu\text{g/L}$
- 1,1,2,2-Tetrachloroethane 10 $\mu\text{g/L}$

The most conservative, corresponding regulatory guideline for each of these VOCs includes:

- TCE 2.8 $\mu\text{g/L}$ - NC Water Quality Standard (NCWQS)
- 1,2-DCE 70 $\mu\text{g/L}$ - Federal Maximum Contaminant Level (MCL)
- PCE 0.7 $\mu\text{g/L}$ - NCWQS
- 1,1,2,2-Tetrachloroethane NCWQS and MCL Not Established

The maximum RI detections of both TCE and PCE were above regulatory guidelines; however, none of the RI detections of 1,2-DCE exceeded the NCWQS. In addition, 1,1,2,2-Tetrachloroethane does not presently have a comparable regulatory guideline. Figure 36-1 identifies the locations of the groundwater monitoring wells that were sampled and the associated organic concentrations that were detected during the RI/FS.

2.2 Post-RI Field Investigation and Results

As noted in Section 1.0, two additional groundwater monitoring wells were installed at Site 36 in June, 1997. These two monitoring wells, IR36-GW16IW and IR36-GW17, were sampled on July 2, 1997 and analyzed for target compound list (TCL) volatiles.

Results of the post-RI groundwater samples indicated low levels of TCE (6 J $\mu\text{g/L}$) and 1,2-DCE (5 J $\mu\text{g/L}$) within newly installed monitoring well IR36-GW16IW. As shown on Figure 36-2, this monitoring well is located slightly upgradient of the RI-estimated VOC plume which has been identified in the northern portion of Site 36. Based on this well's location and the detected concentrations with respect to the northern area, it is our interpretation that the results of the post-RI field investigation are consistent with the RI findings related to the extent of VOC groundwater contamination.

Analytical results collected from the second newly installed monitoring well, IR36-GW17, were below all of the TCL volatile organic detection limits. Therefore, these results appear to support the conclusion that the VOCs identified in the northern portion of Site 36 are not the result of an off-site

(upgradient) source. Appendix A presents the Chain-of-Custody (COC) and the Summary of Analytical Results acquired from the analytical laboratory for the July, 1997 sampling of monitoring wells IR36-GW16IW and IR36-GW17.

2.3 Proposed Groundwater Remedial Action for Site 36

Based upon the results of the RI/FS and the post-RI groundwater investigation, the proposed remedial action that appears best suited for the VOCs detected in the groundwater at Site 36 remains NA. This remedial action alternative was presented within the Draft Final FS as RAA 3 - Natural Attenuation. Following a review of the RI/FS and post-RI analytical data collected to date, natural attenuation of the chlorinated solvents appears to be occurring as an on-going, active means of remediation. The following evidence and supportive information related to incorporation of this groundwater remedial alternative at Site 36 includes:

- The VOCs detected in the groundwater at Site 36 did not generate unacceptable human health risk values. For example, the risk value generated for TCE calculated to 6.9×10^{-7} under the future residential child exposure scenario. This risk value is far below the United States (US) Environmental Protection Agency (EPA) acceptable risk range of 1×10^{-4} to 1×10^{-6} . (The remainder of the risk calculations can be found in the RI/FS.)
- Based on the detections and concentrations of PCE, TCE, and 1,2-DCE within the groundwater at Site 36, it appears that reductive dehalogenation is occurring naturally.
- To date, VOCs have not been detected within the adjacent surface water samples collected from Brinson Creek. Additionally, based on the site-specific, NC Risk Analysis Framework calculations, the calculated allowable TCE groundwater concentration (considering the associated surface water discharge concentration that is environmentally protective), calculated to 1,757 $\mu\text{g/L}$. This value is well above the maximum groundwater concentration of 97 $\mu\text{g/L}$ that was detected at Site 36.

Figure 36-3 presents a layout of the proposed RAA 3 - Natural Attenuation monitoring program. The NA monitoring program envisioned for Site 36 includes monitoring of both the groundwater and the surface water. Initially, groundwater samples will be collected and analyzed for TCL VOCs, nitrate, dissolved organic carbon, sulfate, methane/ethane/ethene, chloride, dissolved oxygen, iron II, alkalinity, OPR, pH, temperature, conductivity, and hydrogen. Over time, the results of these analyses will be evaluated to predict the type and amount of contaminant reduction that has occurred and that can be expected. Surface water samples will be collected and analyzed solely for TCL VOCs. Five years of quarterly sampling, followed by 25 years of semiannual sampling is recommended; however, it is anticipated that the monitoring program will be refined based upon the results of the first several years of data.

The remainder of RAA 3 as described in the Draft Final FS, with the exception of the microcosm study, is recommended as well. Annual contaminant fate and transport models will provide additional evidence that NA is occurring, while the aquifer use restrictions will prohibit the future use of the surficial aquifer within a one-mile radius of Site 36. Based upon the results and overall information collected to date, it appears that the microcosm study is not necessarily warranted, nor cost effective for Site 36. Therefore, this study will not be considered within RAA 3 for the Final FS.

3.0 SITE 54 - CRASH CREW FIRE TRAINING BURN PIT

3.1 Summary of the Site 54 Remedial Investigation VOC Results

Both VOCs and semivolatile organic compounds (SVOCs) were detected in the groundwater immediately adjacent to the burn pit and the underground storage tank (UST) located at Site 54. Organic compounds were also detected in the groundwater extending southwest of the burn pit, in the direction of surficial groundwater flow. Leakage of the existing UST is unlikely based upon the 1996 UST inspection results which concluded that the tank tested positive for tightness. In addition, the burn pit has been lined with concrete since 1975. Taking these factors into account, unintentional spills and splashes that have occurred during training exercises are likely to be the predominant source of the VOCs and SVOCs in the site groundwater.

The maximum VOC and SVOC concentrations detected during the Site 54 RI included:

- Benzene 40 µg/L
- Naphthalene 240 µg/L

The most conservative, corresponding regulatory guideline for each of these compounds includes:

- Benzene 1 µg/L - NCWQS
- Naphthalene 21 µg/L - NCWQS

The maximum RI detections of both benzene and naphthalene were above regulatory guidelines. Figure 54-1 identifies the locations of the groundwater monitoring wells that were sampled and the organic concentrations that were detected during the RI.

3.2 Post-RI Field Investigation and Results

Three additional groundwater monitoring wells were installed at Site 54 in June, 1997. These three monitoring wells, IR54-GW11, IR54-GW12, and IR54-GW13, were sampled on July 1, 1997 and analyzed for TCL volatiles.

Results of the post-RI groundwater samples collected from wells IR54-GW11 and IR54-GW13 indicated concentrations below all of the TCL volatile organic detection limits. These two wells are both located downgradient, but within a few hundred feet, of the initial volatile detections. One low level detection of benzene (4 µg/L) was noted within the newly installed monitoring well IR54-GW12. As shown on Figure 54-2, this monitoring well is located just northwest of the existing UST. Based on this well's location and the detected benzene concentration with respect to the estimated contaminant extent identified in the Draft Final FS, it is our interpretation that the results of the post-RI field investigation for Site 54 are consistent with the RI findings related to the VOC groundwater contamination. These results support the conclusion that the surficial groundwater VOC and SVOC plumes identified in the vicinity of the burn pit and the UST have not migrated far from their assumed source locations. The COC and the Summary of Analytical Results acquired from the analytical laboratory for the July sampling of monitoring wells IR54-GW11, IR54-GW12, and IR54-GW13 is included within Appendix A.

Additional, related activities at Site 54 include MCB, Camp Lejeune's current discussions and preparation of preliminary design requirements associated with the burn pit operational controls (conversion of the existing burn pit to a fully lined and closed accelerant [propane] distribution system). Completion of the operational control design requirements and initiation of the associated burn pit construction is anticipated in the spring of 1998.

3.3 Proposed Groundwater Remedial Action for Site 54

Based upon the results of the RI/FS and the post-RI groundwater investigation, the proposed remedial action that appears best suited for the VOCs and SVOCs detected in the groundwater at Site 54 remains NA. This remedial action alternative was presented within the Draft Final FS as RAA 3 - Natural Attenuation with Operational Controls. Following a review of the RI/FS and post-RI analytical data collected to date, natural attenuation appears to be occurring as an on-going, active means of remediation. The following evidence and supportive information related to incorporation of this groundwater remedial alternative at Site 54 includes:

- The benzene and naphthalene that were detected in the groundwater at Site 54 did not generate unacceptable human health risk values. The estimated incremental lifetime cancer risk (ILCR) for benzene and the child receptor (including ingestion, dermal contact, and inhalation) calculated to 4.95×10^{-6} . The value falls within the USEPA acceptable risk range of 1×10^{-4} to 1×10^{-6} . The hazard index for naphthalene and the child receptor calculated to 0.27. This value is below 1.0 which was considered the end point for determining noncarcinogenic remedial action levels within the RI/FS.
- Documentation of the remedial success related to the natural attenuation of fuel-related compounds has been published in numerous technical journals and is generally widely accepted. Therefore, these documented case and full-scale investigations help to support the assumption that the benzene and naphthalene detected in the groundwater at Site 54 may be naturally attenuating.
- Preliminary results of a fate and transport groundwater model, calibrated to interpret the results of natural attenuation, indicate a 95 percent (%) reduction of the maximum detected benzene concentration over a ten year period. Similarly, naphthalene is expected to naturally attenuate by 77 % over a 30 year time period.
- Operational controls are expected to effectively eliminate the potential for future groundwater contamination associated with future fire training exercises.

Figure 54-3 presents a layout of the monitoring program and proposed construction project for Site 54 under RAA 3 - Natural Attenuation with Operational Controls. The NA monitoring program envisioned for Site 54 includes collection of groundwater samples and analyses of TCL VOCs and SVOCs, dissolved organic carbon, nitrate, sulfate, methane/ethane/ethene, chloride, dissolved oxygen, iron II, alkalinity, OPR, pH, temperature, conductivity, and hydrogen. Over time, the results of these analyses will be evaluated to predict the type and amount of contaminant reduction that has occurred and that can be expected. Five years of quarterly sampling, followed by 25 years of semiannual sampling is recommended; however, it is anticipated that the monitoring program will be refined based upon the results of the first several years of data.

The remainder of RAA 3 as described in the Draft Final FS excluding the microcosm study, but including incorporation of the operational controls, is recommended as well. Annual contaminant fate and transport models will provide additional evidence that NA is occurring, while the aquifer use restrictions will prohibit the future use of the surficial aquifer within a one-mile radius of Site 54. Based upon the results and overall information collected to date, it appears that the microcosm study is not necessarily warranted, nor cost effective for Site 54. Therefore, this study will not be considered within RAA 3 for the Final FS.

4.0 SITE 86 - TANK AREA AS419-AS421

4.1 Summary of the Site 86 Remedial Investigation VOC Results

VOCs were detected during the RI in the site groundwater, with the maximum detections observed in samples collected from the intermediate wells located in the central and southeastern portions of the site. Based on the results of the samples collected from the deep wells that were installed at Site 86 (screen depths located approximately 90 feet bgs), the RI results indicate that the VOCs have not migrated below a depth of approximately 65 feet bgs. These results lead to the conclusion that the vertical movement of the VOCs appears to be restricted by the retarding layer that was encountered. This retarding layer is composed of silty sand with a vertical conductivity measured under laboratory conditions at 10^{-7} centimeters per second (cm/s).

The maximum VOC concentrations detected during the Site 86 RI included:

●	TCE	400 µg/L
●	1,2-DCE	140 µg/L
●	PCE	77 µg/L
●	Benzene	8 µg/L

The most conservative, corresponding regulatory guideline for each of these VOCs include:

●	TCE	2.8 µg/L - NCWQS
●	1,2-DCE	70 µg/L - MCL
●	PCE	0.7 µg/L - NCWQS
●	Benzene	1 µg/L - NCWQS

The maximum detections of each of the noted VOCs are in excess of their corresponding regulatory guideline. Figure 86-1 identifies the locations of the groundwater monitoring wells that were sampled and the organic concentrations that were detected during the RI.

4.2 Post-RI Field Investigation and Results

Three additional groundwater monitoring wells were installed at Site 86 in June, 1997. These three monitoring wells, IR86-GW28IW, IR86-GW29IW, and IR86-GW30IW, were sampled on July 1, 1997 and analyzed for TCL volatiles.

Results of the post-RI groundwater samples indicated that two of the monitoring wells had analytical results that were below all of the TCL volatile organic detection limits. Monitoring well IR86-GW28IW is located downgradient, in the direction of groundwater flow, while monitoring well IR86-GW30IW is located to the southwest, upgradient of the initial volatile detections. The analytical

results which confirmed the non-detection of volatiles in monitoring well IR86-GW30IW support the conclusion that the groundwater VOC plume identified in the vicinity of the previous above ground tanks is not the result of the migration of an off-site, upgradient source. In addition, the volatile non-detection results of the sample collected from IR86-GW28IW helps to define the downgradient limits of the estimated extent of the VOC plume.

The analytical results associated with the sample collected in July, 1997 from monitoring well IR86-GW29IW indicated the presence of TCE at a concentration of 530 E $\mu\text{g/L}$ and 1,2-DCE at a concentration of 56 $\mu\text{g/L}$. This TCE concentration was higher than the maximum TCE concentration detected during the RI from monitoring well IR86-GW10IW. The location and maximum TCE concentration detected in IR86-GW29IW, with respect to the close proximity and low level of TCE within RI monitoring well IR86-GW16IW, prompted a series of investigations and data searches.

Historical aerial photographs dating back to the early 1950s were reviewed to gain insight into the development of the area surrounding Site 86. Site plans and equipment layouts were reviewed in order to gain knowledge as to the use and/or possible connection to the existing VOC plume. During this search, two unrelated pieces of information were collected. During the 1950s, a para loft, a generating station, and a battery shop were all identified structures located directly east of the above ground storage tanks previously located at Site 86. Although these buildings were identified, no information surfaced that would lead to a direct connection with the VOC plume. During a field visit of the adjoining properties and buildings, several UST monitoring wells were discovered to the east of the site. These UST monitoring wells are part of a separate investigation and were not sampled for chlorinated compounds. Similar to the findings of the document search, the field visit did not produce evidence that the adjoining properties or buildings were the source of the VOC detections at monitoring well IR86-GW29IW.

Based on the VOC detections noted in monitoring well IR86-GW29IW, it was agreed that the installation of a fourth monitoring well (IR86-GW31IW) and the collection of additional groundwater samples from monitoring wells IR86-GW16IW, the UST well AS428 GW06, and IR86-GW29IW would better define the plume. Therefore, samples were initially collected on September 7, 1997, from monitoring wells IR86-GW16IW and AS428 GW06. TCL volatile concentrations detected in IR86-GW16IW were consistent with the RI results for this well. In September, 1997, TCE was detected within IR86-GW16IW at a concentration of 2 J $\mu\text{g/L}$ and 1,2-DCE was detected at a concentration of 3 J $\mu\text{g/L}$. Positive detections of TCE (2 J $\mu\text{g/L}$), 1,2-DCE (50 $\mu\text{g/L}$), and benzene (3 J $\mu\text{g/L}$) were detected in the UST well AS428-GW06. These results were used to best place the fourth monitoring well (IR86-GW31IW) downgradient of IR86-GW29IW. Following the installation of monitoring well IR86-GW31IW, groundwater samples were collected on September 17, 1997 from this well and from monitoring well IR86-GW29IW. TCL VOCs were detected in both of these wells as follows:

- IR86-GW29IW: TCE 740 E $\mu\text{g/L}$ (700 D $\mu\text{g/L}$)
 1,2-DCE 73 $\mu\text{g/L}$
 Vinyl Chloride (VC) 2 J $\mu\text{g/L}$

- IR86-GW31IW: TCE 9 J $\mu\text{g/L}$
 1,2-DCE 2 J $\mu\text{g/L}$

Methylene chloride was detected in both of these samples; however, this compound is suspected as a laboratory contaminant.

Although the post-RI TCE groundwater results were higher than the detections noted during the RI, the results were not significantly higher (i.e., 400 vs. 740 E µg/L). In addition, the overall proximity of the maximum TCE detection to the site and its close proximity to significantly lower VOC detections (GW16IW, GW28IW, and GW31IW), it is our interpretation that the results of the post-RI field investigation for Site 86 have sufficiently identified the limits of the VOC plume. The COC and the Summary of Analytical Results acquired from the analytical laboratory for the July and September sampling of monitoring wells IR86-GW16IW, IR86-GW28IW, IR86-GW29IW, IR86-GW30IW, IR86-GW31IW, and UST AS428 GW06 are included within Appendix A.

4.3 Proposed Groundwater Remedial Action for Site 86

Based upon the results of the RI/FS and the post-RI groundwater investigation, the proposed remedial action that appears best suited for the VOCs detected in the groundwater at Site 86 remains NA. This remedial action alternative was presented within the Draft Final FS as RAA 3 -Natural Attenuation. Natural attenuation of the chlorinated solvents appears to be occurring as an on-going, active means of remediation at Site 86. The following evidence and supportive information related to incorporation of this groundwater remedial alternative includes:

- Based on the detections of PCE, TCE, 1,2-DCE, and VC within the groundwater at Site 86, and their locations and contaminant concentration distribution, it appears that reductive dehalogenation is occurring naturally.
- The above ground storage tanks were removed in 1992. In addition, neither PCE nor TCE were detected in the soil samples collected from Site 86. This information suggests that the source has been removed, while the residual constituents appear to have migrated to the groundwater.
- Aside from the New River (which is located approximately one mile northeast of the site), the closest production well is located approximately 1,200 feet northwest (or side gradient) of Site 86. Therefore, potential impact to existing receptors due to the contaminant concentrations detected in the groundwater at Site 86 appears unlikely.
- Human health risk numbers were recently calculated for the adult and child, future residential scenario. The exposure pathways that were considered included groundwater ingestion and dermal contact. Both of these exposure pathways and receptors are unlikely for the existing, industrialized setting of Site 86; however, the risks were calculated based upon the maximum (post-RI) detections of TCE and vinyl chloride. These results are considered very conservative, as typically, the maximum concentration of a compound is generally not used for the risk calculation. Therefore, the following results should simply provide a reference. In addition, groundwater detections of vinyl chloride typically trigger human health risks. In the case of Site 86; however, the detection of vinyl chloride further defines the NA process. Total ILCR for TCE and vinyl chloride calculated to 1.4×10^{-4} (adult) and 6.5×10^{-5} (child); while total HI calculated to 3.3 (adult) and 7.8 (child). These risk numbers are expected to decrease when considering the accepted risk

calculation presentation which utilizes the upper confidence limit of each compound.

Figure 86-3 presents a layout of the proposed RAA 3 -Natural Attenuation monitoring program. The NA monitoring program envisioned for Site 86 includes monitoring of the groundwater within the lower portion of the surficial aquifer and the upper portion of the Castle Hayne aquifers as shown. The installation of one additional intermediate monitoring well (IR86-GW32IW) and one additional deep monitoring well (IR86-GW31DW) at the initiation of the NA monitoring will help to monitor and track any plume migration both horizontally and vertically. Initially, groundwater samples will be collected and analyzed for TCL VOCs, nitrate, sulfate, methane/ethane/ethene, chloride, dissolved oxygen, iron II, alkalinity, dissolved organic carbon, OPR, pH, temperature, conductivity, and hydrogen. Over time, the results of these analyses will be evaluated to predict the type and amount of contaminant reduction that has occurred and that can be expected. Five years of quarterly sampling, followed by 25 years of semiannual sampling is recommended; however, it is anticipated that the monitoring program will be refined based upon the results of the first several years of data.

The remainder of RAA 3 as described in the Draft Final FS, with the exception of the microcosm study, is recommended as well. Contaminant fate and transport models will provide additional evidence that NA is occurring, while the aquifer use restrictions will prohibit the future use of the surficial aquifer at Site 86. Based on the results and overall information collected to date, it appears that the microcosm study is not necessarily warranted, nor cost effective for Site 86. Therefore, this study will not be considered within RAA 3 for the Final FS.

5.0 CONCLUSIONS

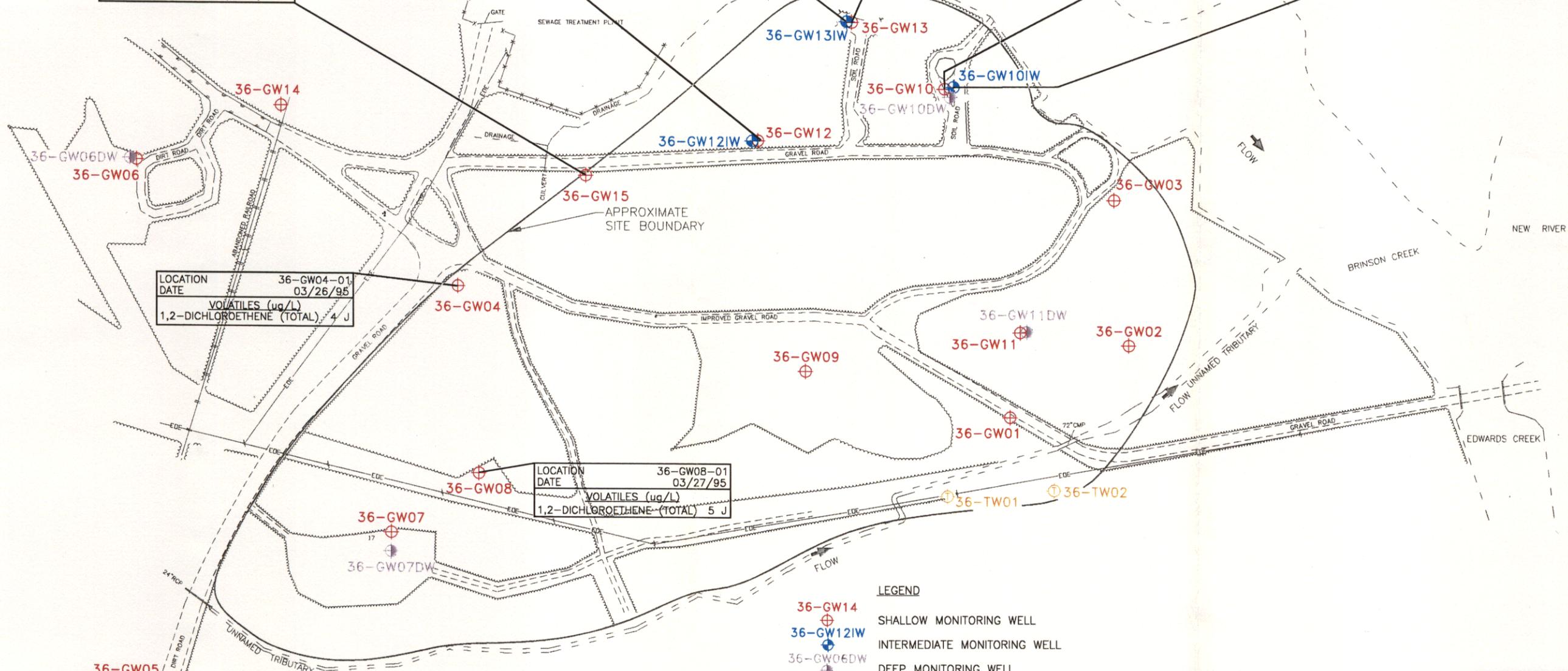
As presented in Sections 2.0, 3.0, and 4.0, NA remains the recommended remedial alternative for Sites 36, 54 (with the inclusion of Operational Controls), and 86. The revised monitoring locations associated with each of these sites have been presented on the accompanying figures (36-3, 54-3, and 86-3). These figures represent the proposed locations for the groundwater monitoring required to support and document NA as defined within the Draft Final FS documents and this letter report. As noted, installation of two additional monitoring wells at Site 86 is recommended during the initial round of NA groundwater monitoring. Since the post-RI findings are typically in line with the results of the RI/FS, revised groundwater fate and transport models have not been completed for any of these sites. Groundwater modeling is, however, anticipated and accounted for within the NA remedial alternatives for Sites 36, 54, and 86.

In conclusion, the following recommendations are proposed for Sites 36, 54, and 86:

- Site 36: RAA 3 -Natural Attenuation
- Site 54: RAA 3 -Natural Attenuation with Operational Controls
- Site 86: RAA 3 -Natural Attenuation

FIGURES

LOCATION 36-GW12-01 DATE 05/08/95 VOLATILES (ug/L) TRICHLOROETHENE 9 J 1,1,2,2-TETRACHLOROETHANE 6 J	LOCATION 36-GW13W-01 DATE 05/08/95 VOLATILES (ug/L) 1,2-DICHLOROETHENE (TOTAL) 14 J TRICHLOROETHENE 3 J	LOCATION 36-GW13-01 DATE 05/09/95 VOLATILES (ug/L) 1,2-DICHLOROETHENE (TOTAL) 8 J TRICHLOROETHENE 6 J	LOCATION 36-GW10-01 DATE 03/25/95 VOLATILES (ug/L) TRICHLOROETHENE 8 J PESTICIDES/PCB's (ug/L) 4,4'-DDD 0.056 J
LOCATION 36-GW12-02 DATE 07/11/95 VOLATILES (ug/L) TRICHLOROETHENE 4 J 1,1,2,2-TETRACHLOROETHANE 3 J	LOCATION 36-GW13W-02 DATE 07/11/95 VOLATILES (ug/L) 1,2-DICHLOROETHENE (TOTAL) 9 J TRICHLOROETHENE 3 J	LOCATION 36-GW13-02 DATE 07/11/95 VOLATILES (ug/L) 1,2-DICHLOROETHENE (TOTAL) 13 TRICHLOROETHENE 5 J 1,1,2,2-TETRACHLOROETHANE 4 J	LOCATION 36-GW10-02 DATE 07/11/95 VOLATILES (ug/L) METHYLENE CHLORIDE 1 J TRICHLOROETHENE 10 TETRACHLOROETHENE 1 J 1,1,2,2-TETRACHLOROETHANE 3 J PESTICIDES/PCB's (ug/L) 4,4'-DDD ND
LOCATION 36-GW15-01 DATE 12/27/96 VOLATILES (ug/L) 1,2-DICHLOROETHENE (TOTAL) 12			LOCATION 36-GW10W-01 DATE 05/09/95 VOLATILES (ug/L) 1,2-DICHLOROETHENE (TOTAL) 31 J TRICHLOROETHENE 70 1,1,2,2-TETRACHLOROETHANE 10
			LOCATION 36-GW10W-02 DATE 07/11/95 VOLATILES (ug/L) 1,2-DICHLOROETHENE (TOTAL) 37 TRICHLOROETHENE 97 TETRACHLOROETHENE 2 J 1,1,2,2-TETRACHLOROETHANE 8 J



LOCATION	36-GW04-01
DATE	03/26/95
VOLATILES (ug/L)	
1,2-DICHLOROETHENE (TOTAL)	4 J

LOCATION	36-GW08-01
DATE	03/27/95
VOLATILES (ug/L)	
1,2-DICHLOROETHENE (TOTAL)	5 J

- LEGEND**
- 36-GW14 (Red circle with cross) SHALLOW MONITORING WELL
 - 36-GW12IW (Blue circle with cross) INTERMEDIATE MONITORING WELL
 - 36-GW06DW (Black circle with cross) DEEP MONITORING WELL
 - 36-TW01 (Orange circle with cross) TEMPORARY MONITORING WELL
 - (Dotted pattern) CONCENTRATION EXCEEDS THE NCWQS AND/OR FEDERAL MCL
 - (Arrow) FLOW DIRECTION OF SURFACE WATER FLOW
 - (Line with 'X') OEO OVERHEAD ELECTRIC LINE & UTILITY POLE
 - (Line with 'X') FENCE
 - (Hatched pattern) ASPHALT ROAD
 - (Dashed pattern) GRAVEL ROAD
 - (Wavy line) EDGE OF CREEK, OR DRAINAGE DITCH
 - (Wavy line) TREE LINE

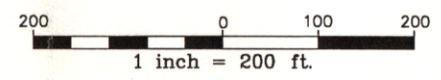
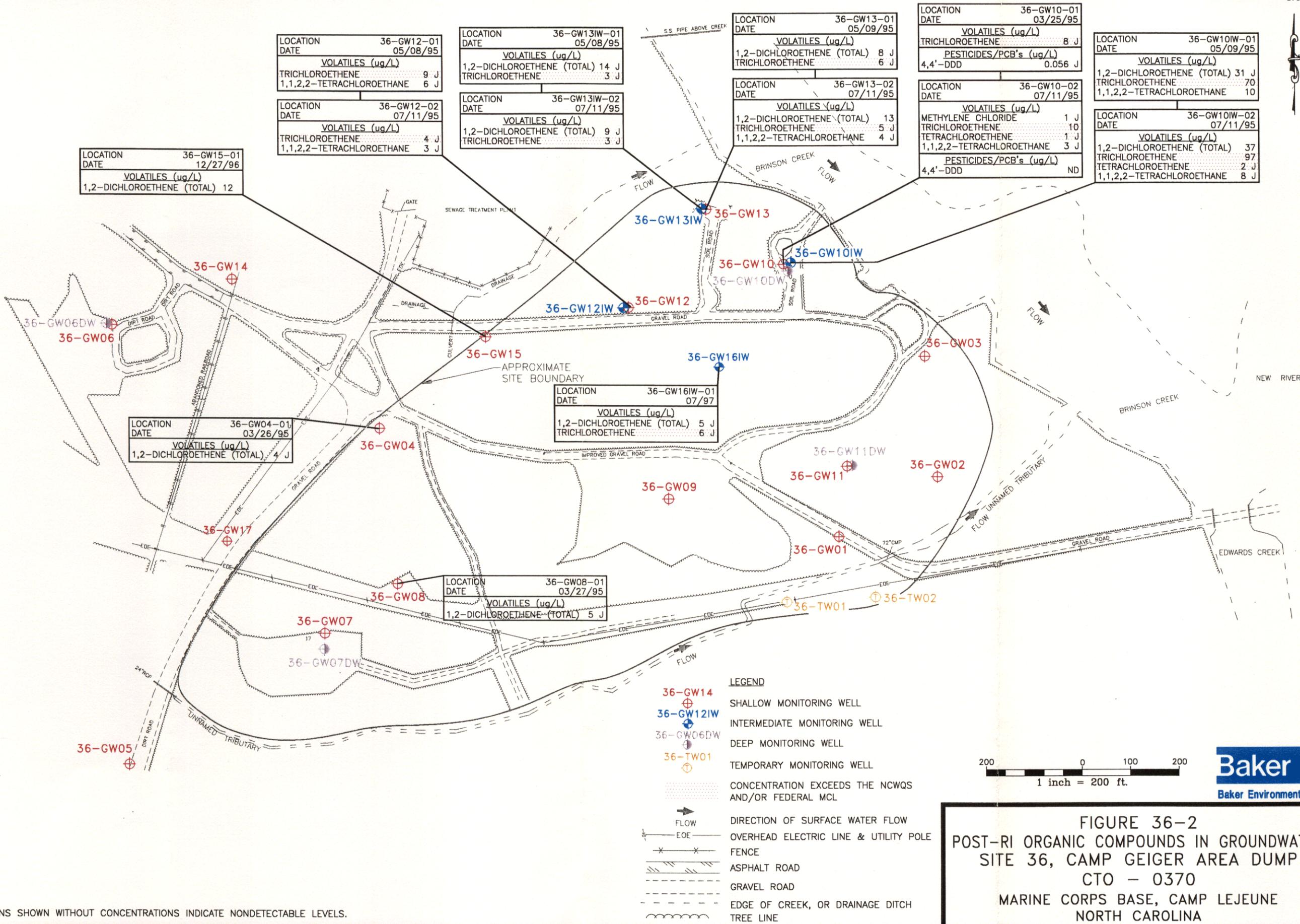


FIGURE 36-1
ORGANIC COMPOUNDS IN GROUNDWATER - RI
SITE 36, CAMP GEIGER AREA DUMP
CTO - 0370
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA

NOTE: LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATE NONDETECTABLE LEVELS.



NOTE: LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATE NONDETECTABLE LEVELS.

FIGURE 36-2
POST-RI ORGANIC COMPOUNDS IN GROUNDWATER
SITE 36, CAMP GEIGER AREA DUMP
CTO - 0370
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



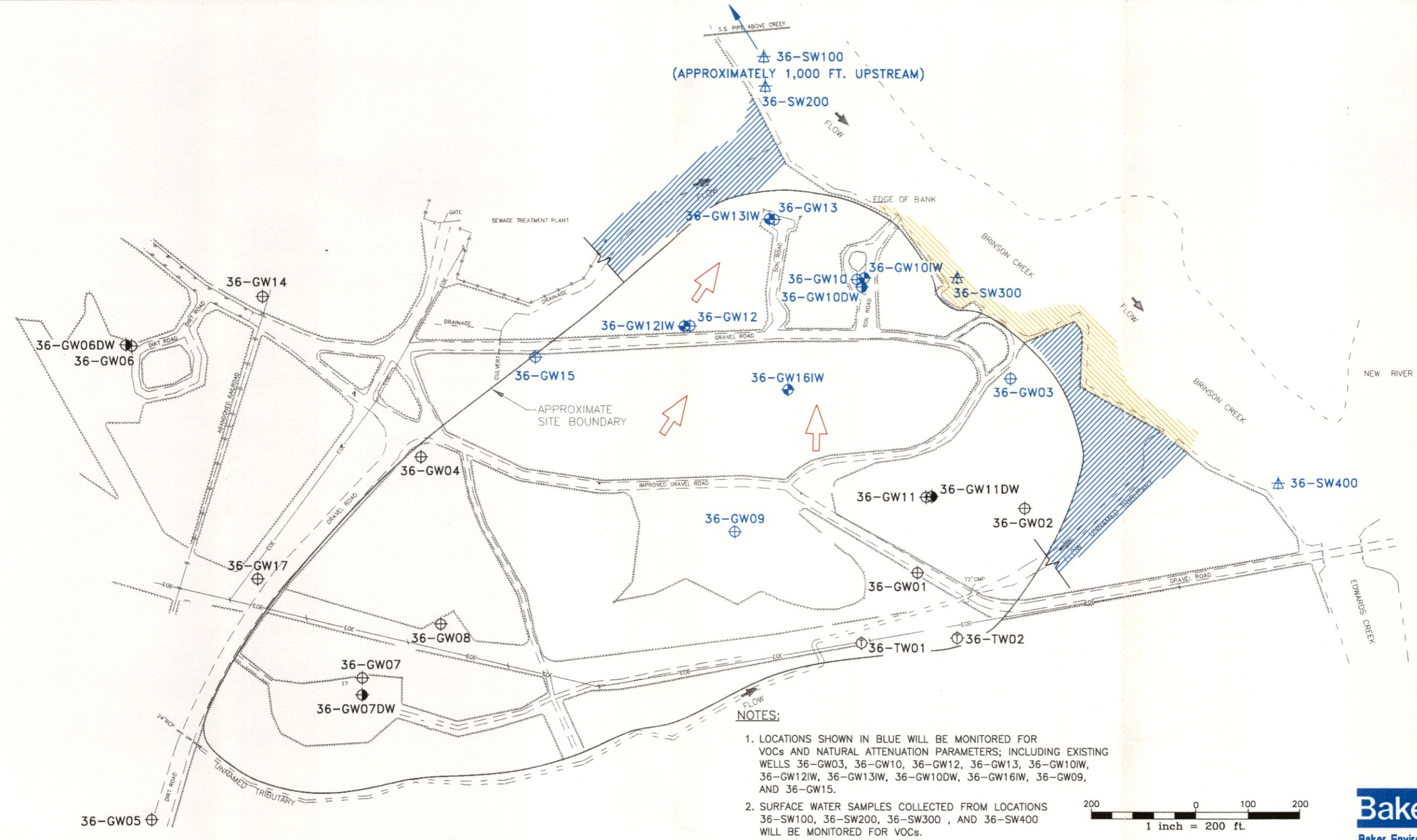
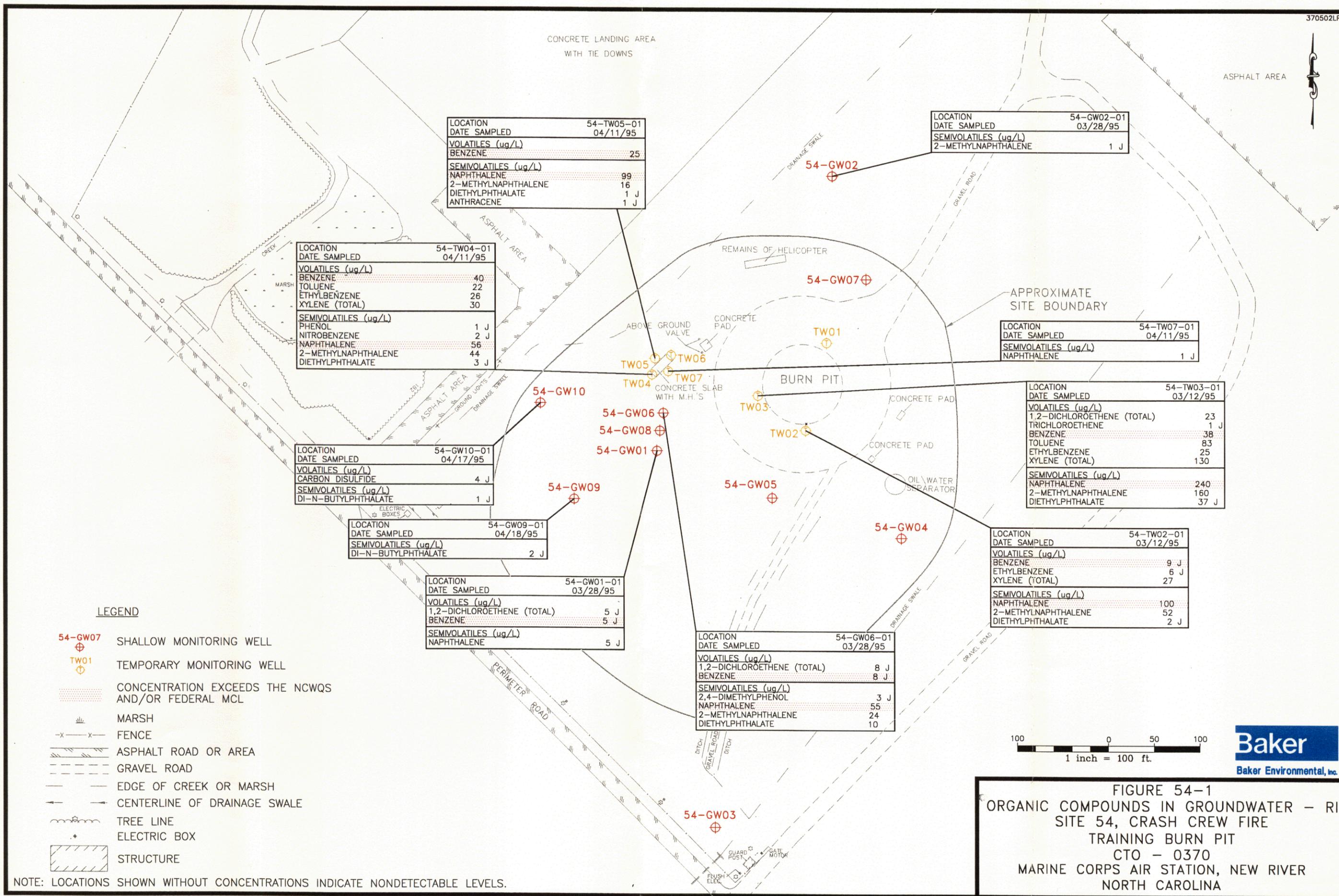


FIGURE 36-3
RAA 3: NATURAL ATTENUATION
MONITORING PROGRAM
SITE 36, CAMP GEIGER AREA DUMP
CTO - 0370
MARINE CORPS BASE, CAMP LEJEUNE
NORTH CAROLINA



LOCATION	54-TW05-01
DATE SAMPLED	04/11/95
VOLATILES (ug/L)	
BENZENE	25
SEMIVOLATILES (ug/L)	
NAPHTHALENE	99
2-METHYLNAPHTHALENE	16
DIETHYLPHTHALATE	1 J
ANTHRACENE	1 J

LOCATION	54-GW02-01
DATE SAMPLED	03/28/95
SEMIVOLATILES (ug/L)	
2-METHYLNAPHTHALENE	1 J

LOCATION	54-TW04-01
DATE SAMPLED	04/11/95
VOLATILES (ug/L)	
BENZENE	40
TOLUENE	22
ETHYLBENZENE	26
XYLENE (TOTAL)	30
SEMIVOLATILES (ug/L)	
PHENOL	1 J
NITROBENZENE	2 J
NAPHTHALENE	56
2-METHYLNAPHTHALENE	44
DIETHYLPHTHALATE	3 J

LOCATION	54-TW07-01
DATE SAMPLED	04/11/95
SEMIVOLATILES (ug/L)	
NAPHTHALENE	1 J

LOCATION	54-TW03-01
DATE SAMPLED	03/12/95
VOLATILES (ug/L)	
1,2-DICHLOROETHENE (TOTAL)	23
TRICHLOROETHENE	1 J
BENZENE	38
TOLUENE	83
ETHYLBENZENE	25
XYLENE (TOTAL)	130
SEMIVOLATILES (ug/L)	
NAPHTHALENE	240
2-METHYLNAPHTHALENE	160
DIETHYLPHTHALATE	37 J

LOCATION	54-GW10-01
DATE SAMPLED	04/17/95
VOLATILES (ug/L)	
CARBON DISULFIDE	4 J
SEMIVOLATILES (ug/L)	
DI-N-BUTYLPHTHALATE	1 J

LOCATION	54-TW02-01
DATE SAMPLED	03/12/95
VOLATILES (ug/L)	
BENZENE	9 J
ETHYLBENZENE	6 J
XYLENE (TOTAL)	27
SEMIVOLATILES (ug/L)	
NAPHTHALENE	100
2-METHYLNAPHTHALENE	52
DIETHYLPHTHALATE	2 J

LOCATION	54-GW09-01
DATE SAMPLED	04/18/95
SEMIVOLATILES (ug/L)	
DI-N-BUTYLPHTHALATE	2 J

LOCATION	54-GW01-01
DATE SAMPLED	03/28/95
VOLATILES (ug/L)	
1,2-DICHLOROETHENE (TOTAL)	5 J
BENZENE	5 J
SEMIVOLATILES (ug/L)	
NAPHTHALENE	5 J

LOCATION	54-GW06-01
DATE SAMPLED	03/28/95
VOLATILES (ug/L)	
1,2-DICHLOROETHENE (TOTAL)	8 J
BENZENE	8 J
SEMIVOLATILES (ug/L)	
2,4-DIMETHYLPHENOL	3 J
NAPHTHALENE	55
2-METHYLNAPHTHALENE	24
DIETHYLPHTHALATE	10

LEGEND

- 54-GW07 ⊕ SHALLOW MONITORING WELL
- TW01 ⊕ TEMPORARY MONITORING WELL
- CONCENTRATION EXCEEDS THE NCWQS AND/OR FEDERAL MCL
- ▭ MARSH
- x-x- FENCE
- ▨ ASPHALT ROAD OR AREA
- ▨ GRAVEL ROAD
- EDGE OF CREEK OR MARSH
- CENTERLINE OF DRAINAGE SWALE
- ~~~ TREE LINE
- ⊕ ELECTRIC BOX
- ▭ STRUCTURE

NOTE: LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATE NONDETECTABLE LEVELS.

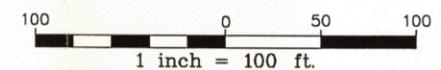
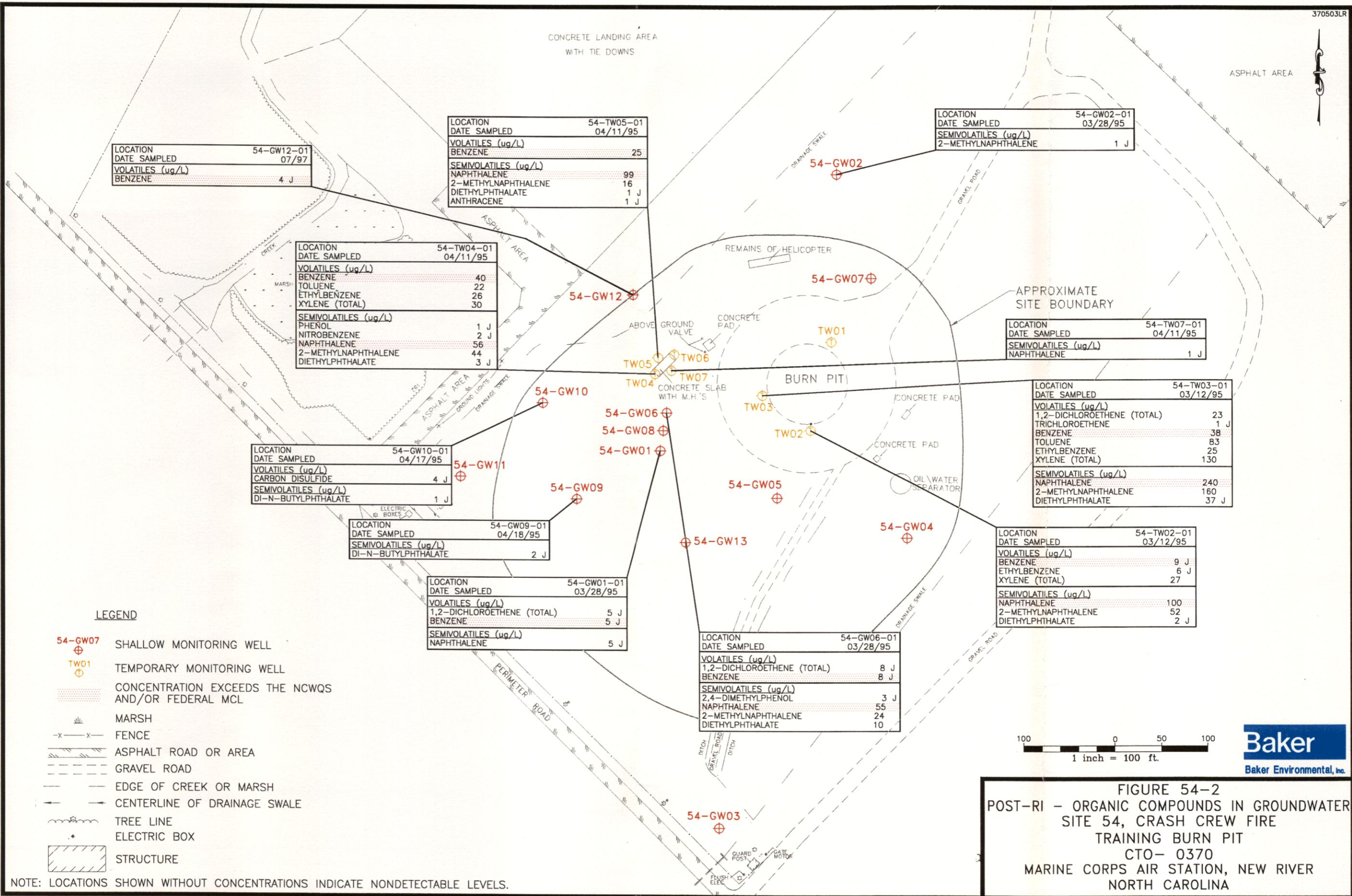


FIGURE 54-1
ORGANIC COMPOUNDS IN GROUNDWATER - RI
SITE 54, CRASH CREW FIRE
TRAINING BURN PIT
CTO - 0370
MARINE CORPS AIR STATION, NEW RIVER
NORTH CAROLINA



LOCATION	54-GW12-01
DATE SAMPLED	07/97
VOLATILES (ug/L)	
BENZENE	4 J

LOCATION	54-TW05-01
DATE SAMPLED	04/11/95
VOLATILES (ug/L)	
BENZENE	25
SEMIVOLATILES (ug/L)	
NAPHTHALENE	99
2-METHYLNAPHTHALENE	16
DIETHYLPHTHALATE	1 J
ANTHRACENE	1 J

LOCATION	54-GW02-01
DATE SAMPLED	03/28/95
SEMIVOLATILES (ug/L)	
2-METHYLNAPHTHALENE	1 J

LOCATION	54-TW04-01
DATE SAMPLED	04/11/95
VOLATILES (ug/L)	
BENZENE	40
TOLUENE	22
ETHYLBENZENE	26
XYLENE (TOTAL)	30
SEMIVOLATILES (ug/L)	
PHENOL	1 J
NITROBENZENE	2 J
NAPHTHALENE	56
2-METHYLNAPHTHALENE	44
DIETHYLPHTHALATE	3 J

LOCATION	54-TW07-01
DATE SAMPLED	04/11/95
SEMIVOLATILES (ug/L)	
NAPHTHALENE	1 J

LOCATION	54-GW10-01
DATE SAMPLED	04/17/95
VOLATILES (ug/L)	
CARBON DISULFIDE	4 J
SEMIVOLATILES (ug/L)	
DI-N-BUTYLPHTHALATE	1 J

LOCATION	54-TW03-01
DATE SAMPLED	03/12/95
VOLATILES (ug/L)	
1,2-DICHLOROETHENE (TOTAL)	23
TRICHLOROETHENE	1 J
BENZENE	38
TOLUENE	83
ETHYLBENZENE	25
XYLENE (TOTAL)	130
SEMIVOLATILES (ug/L)	
NAPHTHALENE	240
2-METHYLNAPHTHALENE	160
DIETHYLPHTHALATE	37 J

LOCATION	54-GW09-01
DATE SAMPLED	04/18/95
SEMIVOLATILES (ug/L)	
DI-N-BUTYLPHTHALATE	2 J

LOCATION	54-TW02-01
DATE SAMPLED	03/12/95
VOLATILES (ug/L)	
BENZENE	9 J
ETHYLBENZENE	6 J
XYLENE (TOTAL)	27
SEMIVOLATILES (ug/L)	
NAPHTHALENE	100
2-METHYLNAPHTHALENE	52
DIETHYLPHTHALATE	2 J

LOCATION	54-GW01-01
DATE SAMPLED	03/28/95
VOLATILES (ug/L)	
1,2-DICHLOROETHENE (TOTAL)	5 J
BENZENE	5 J
SEMIVOLATILES (ug/L)	
NAPHTHALENE	5 J

LOCATION	54-GW06-01
DATE SAMPLED	03/28/95
VOLATILES (ug/L)	
1,2-DICHLOROETHENE (TOTAL)	8 J
BENZENE	8 J
SEMIVOLATILES (ug/L)	
2,4-DIMETHYLPHENOL	3 J
NAPHTHALENE	55
2-METHYLNAPHTHALENE	24
DIETHYLPHTHALATE	10

LEGEND

- 54-GW07 ⊕ SHALLOW MONITORING WELL
- TW01 ⊕ TEMPORARY MONITORING WELL
- CONCENTRATION EXCEEDS THE NCWQS AND/OR FEDERAL MCL
- MARSH
- x-x- FENCE
- ASPHALT ROAD OR AREA
- GRAVEL ROAD
- EDGE OF CREEK OR MARSH
- CENTERLINE OF DRAINAGE SWALE
- TREE LINE
- ELECTRIC BOX
- STRUCTURE

NOTE: LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATE NONDETECTABLE LEVELS.

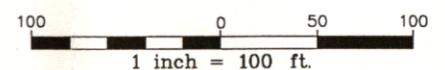
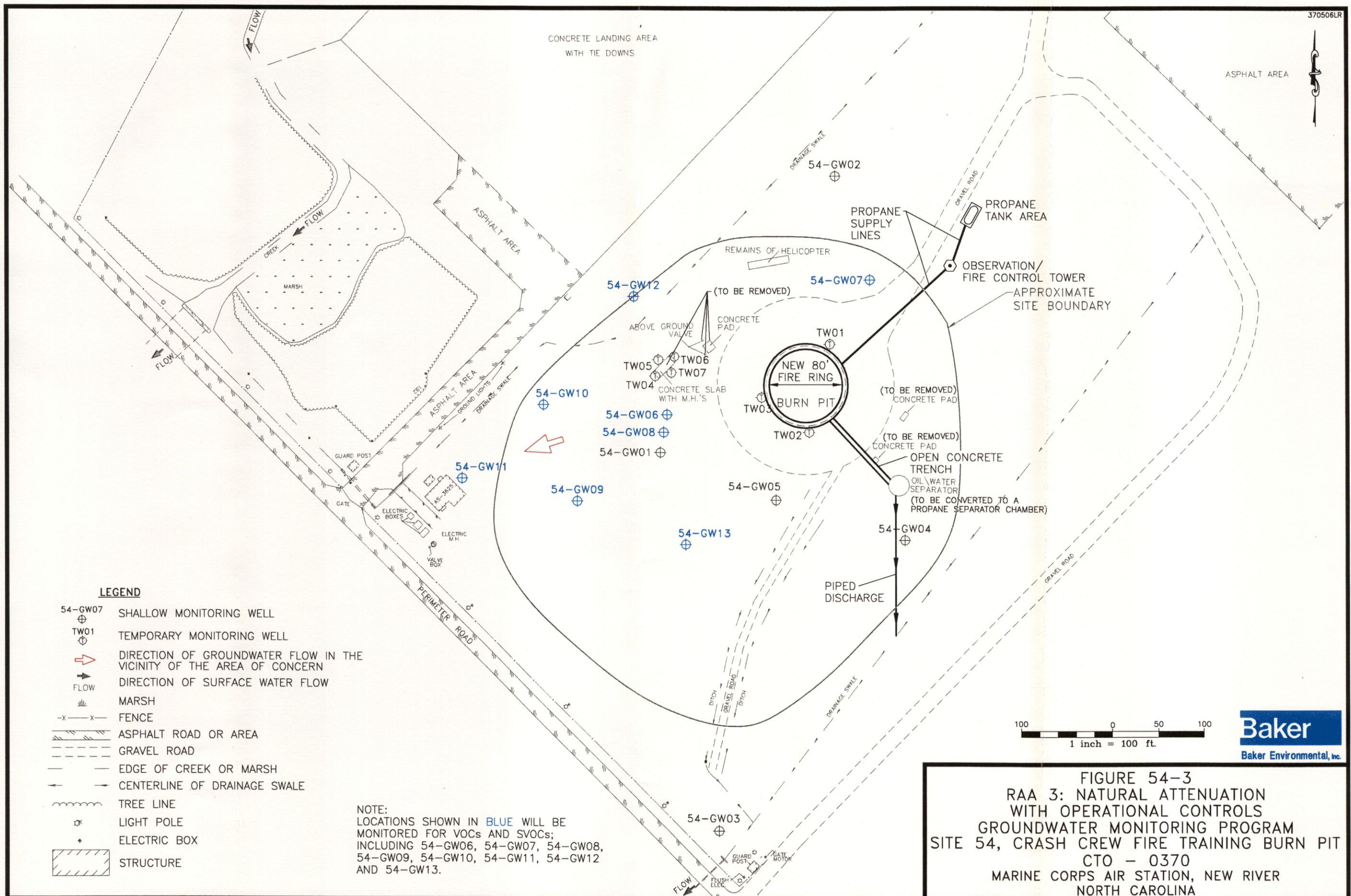


FIGURE 54-2
POST-RI - ORGANIC COMPOUNDS IN GROUNDWATER
SITE 54, CRASH CREW FIRE
TRAINING BURN PIT
CTO- 0370
MARINE CORPS AIR STATION, NEW RIVER
NORTH CAROLINA



LEGEND

- 54-GW07 SHALLOW MONITORING WELL
- TW01 TEMPORARY MONITORING WELL
- DIRECTION OF GROUNDWATER FLOW IN THE VICINITY OF THE AREA OF CONCERN
- DIRECTION OF SURFACE WATER FLOW
- MARSH
- FENCE
- ASPHALT ROAD OR AREA
- GRAVEL ROAD
- EDGE OF CREEK OR MARSH
- CENTERLINE OF DRAINAGE SWALE
- TREE LINE
- LIGHT POLE
- ELECTRIC BOX
- STRUCTURE

NOTE:
 LOCATIONS SHOWN IN BLUE WILL BE MONITORED FOR VOCs AND SVOCs; INCLUDING 54-GW06, 54-GW07, 54-GW08, 54-GW09, 54-GW10, 54-GW11, 54-GW12 AND 54-GW13.

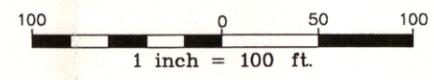
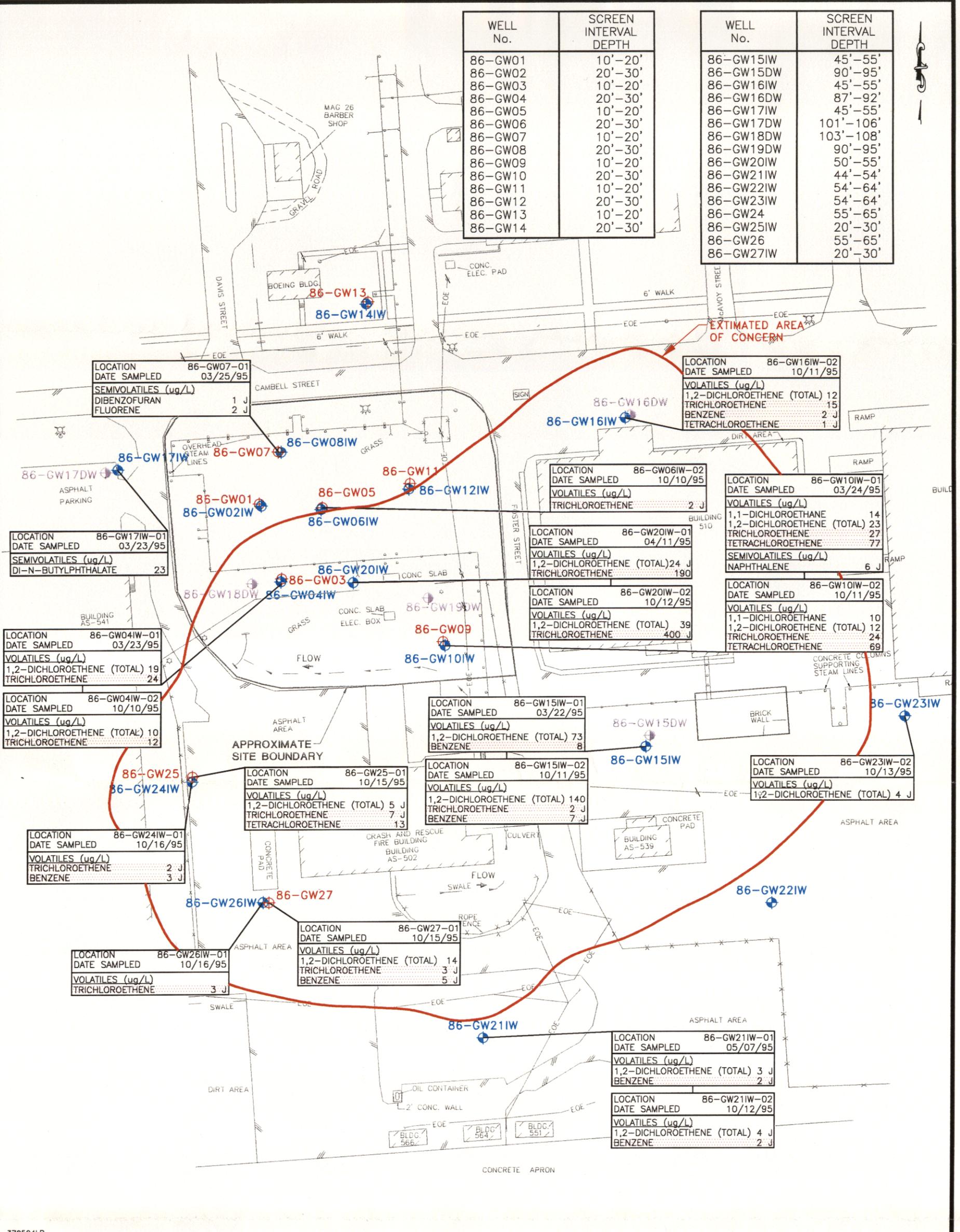


FIGURE 54-3
 RAA 3: NATURAL ATTENUATION WITH OPERATIONAL CONTROLS
 GROUNDWATER MONITORING PROGRAM
 SITE 54, CRASH CREW FIRE TRAINING BURN PIT
 CTO - 0370
 MARINE CORPS AIR STATION, NEW RIVER
 NORTH CAROLINA

WELL No.	SCREEN INTERVAL DEPTH
86-GW01	10'-20'
86-GW02	20'-30'
86-GW03	10'-20'
86-GW04	20'-30'
86-GW05	10'-20'
86-GW06	20'-30'
86-GW07	10'-20'
86-GW08	20'-30'
86-GW09	10'-20'
86-GW10	20'-30'
86-GW11	10'-20'
86-GW12	20'-30'
86-GW13	10'-20'
86-GW14	20'-30'

WELL No.	SCREEN INTERVAL DEPTH
86-GW15IW	45'-55'
86-GW15DW	90'-95'
86-GW16IW	45'-55'
86-GW16DW	87'-92'
86-GW17IW	45'-55'
86-GW17DW	101'-106'
86-GW18DW	103'-108'
86-GW19DW	90'-95'
86-GW20IW	50'-55'
86-GW21IW	44'-54'
86-GW22IW	54'-64'
86-GW23IW	54'-64'
86-GW24	55'-65'
86-GW25IW	20'-30'
86-GW26	55'-65'
86-GW27IW	20'-30'



370504LR

LEGEND

- 86-GW01 SHALLOW MONITORING WELL
- 86-GW04IW INTERMEDIATE MONITORING WELL
- ⊕ 86-GW18DW DEEP MONITORING WELL
- FLOW DIRECTION OF SURFACE WATER FLOW
- EOE OVERHEAD ELECTRIC LINE & UTILITY POLE
- ▬ ASPHALT ROAD
- GRVEL ROAD
- CENTERLINE OF DRAINAGE SWALE
- ☆ LIGHTPOLE
- ▭ STRUCTURE
- CONCENTRATION EXCEEDS THE NCWS AND/OR FEDERAL MCL
- FENCE
- GUY WIRE
- ⊕ FIRE HYDRANT

SOURCE: LANTDIV, OCT. 1991

NOTE: LOCATIONS SHOWN WITHOUT CONCENTRATIONS INDICATE NONDETECTABLE LEVELS.

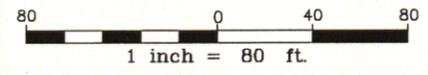
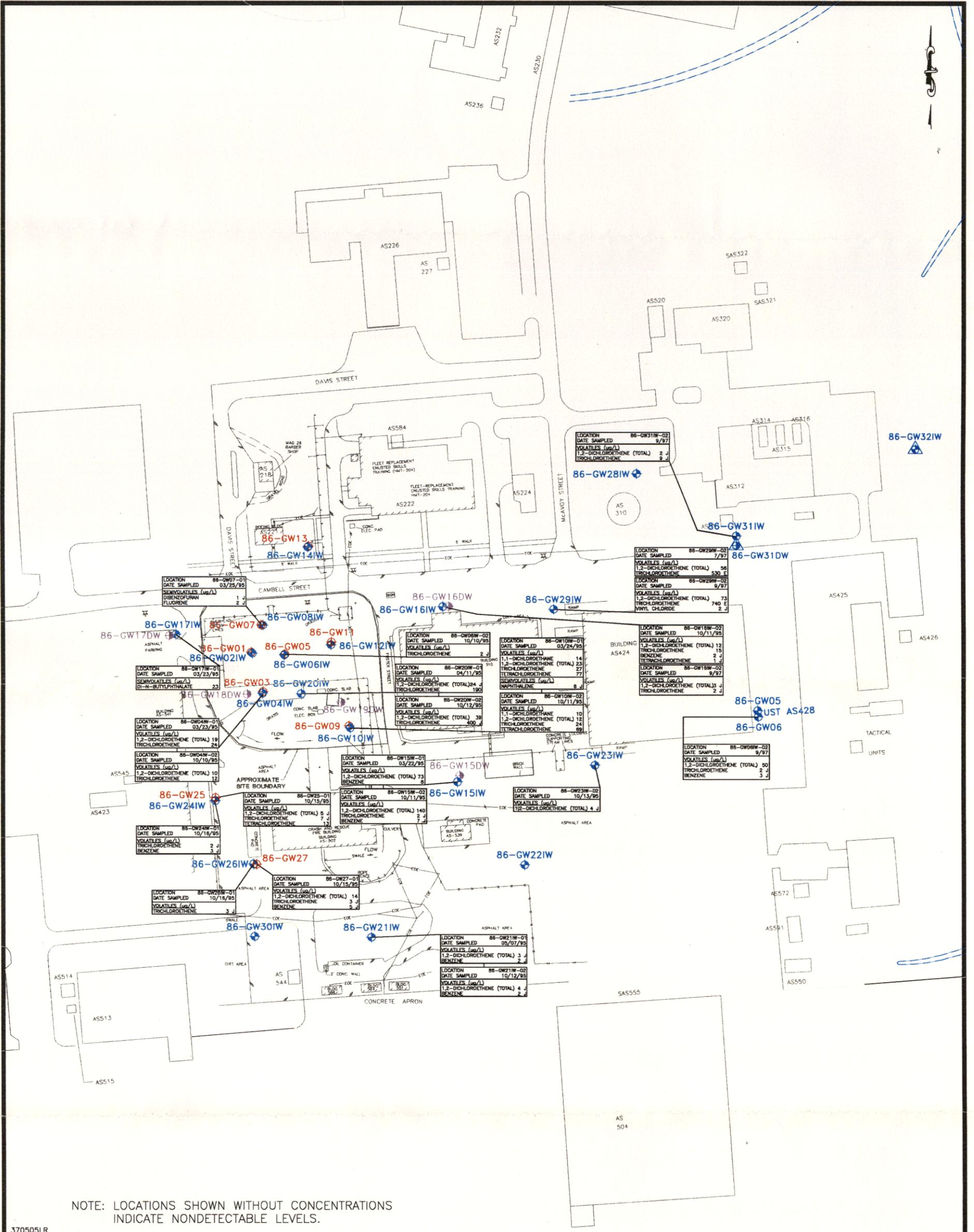


FIGURE 86-1
ORGANIC COMPOUNDS IN GROUNDWATER - RI
SITE 86, TANK AREA AS419-AS421
CTO - 0370
MARINE CORPS AIR STATION, NEW RIVER
CAMP LEJEUNE



370505LR

LEGEND

86-GW01	SHALLOW MONITORING WELL	86-GW32IW	PROPOSED MONITORING WELL
86-GW04IW	INTERMEDIATE MONITORING WELL	---	GRAVEL ROAD
86-GW18DW	DEEP MONITORING WELL	---	FENCE
→	DIRECTION OF SURFACE WATER FLOW	---	GUY WIRE
— EOE	OVERHEAD ELECTRIC LINE & UTILITY POLE	---	FIRE HYDRANT
---	ASPHALT ROAD		
---	CENTERLINE OF DRAINAGE SWALE		
☆	LIGHTPOLE		
▭	STRUCTURE		

SOURCE: LANTDIV, OCT. 1991

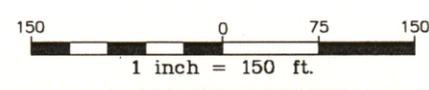
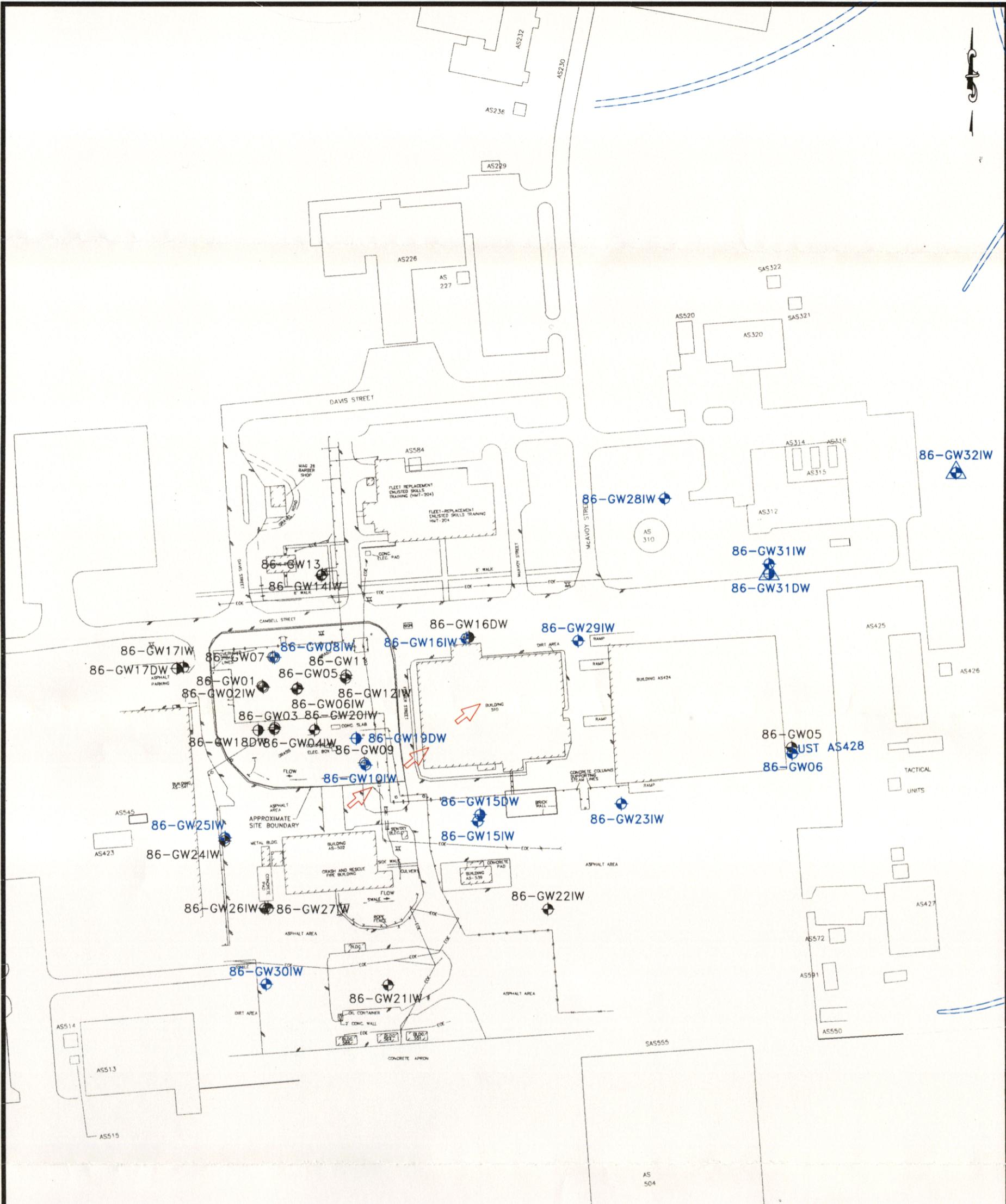


FIGURE 86-2
POST-RI ORGANIC COMPOUNDS IN GROUNDWATER
SITE 86, TANK AREA AS419-AS421 AT MCAS
CTO - 0370
MARINE CORPS AIR STATION, NEW RIVER
CAMP LEJEUNE



NOTE: LOCATIONS SHOWN IN BLUE WILL BE MONITORED FOR VOCs AND THE NATURAL ATTENUATION PARAMETERS, INCLUDING EXISTING WELLS: 86-GW08IW, 86-GW10IW, 86-GW15IW, 86-GW16IW, 86-GW20IW, 86-GW23IW, 86-GW25IW, 86-GW15DW, 86-GW19DW, 86-GW28IW, 86-GW29IW, AND 86-GW31IW; AND NEW WELLS 86-GW31DW AND 86-GW32IW.

370508LR

LEGEND			
86-GW01	SHALLOW MONITORING WELL	86-GW32IW	PROPOSED MONITORING WELL
86-GW04IW	INTERMEDIATE MONITORING WELL	→	DIRECTION OF GROUNDWATER FLOW IN THE VICINITY OF THE AREA OF CONCERN
86-GW18DW	DEEP MONITORING WELL	— — — —	GRAVEL ROAD
→	DIRECTION OF SURFACE WATER FLOW	— — — —	FENCE
— — — —	OVERHEAD ELECTRIC LINE & UTILITY POLE	— — — —	GUY WIRE
— — — —	ASPHALT ROAD	— — — —	FIRE HYDRANT
— — — —	CENTERLINE OF DRAINAGE SWALE		
☆	LIGHTPOLE		
▭	STRUCTURE		

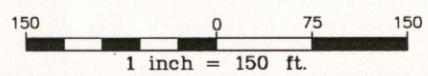
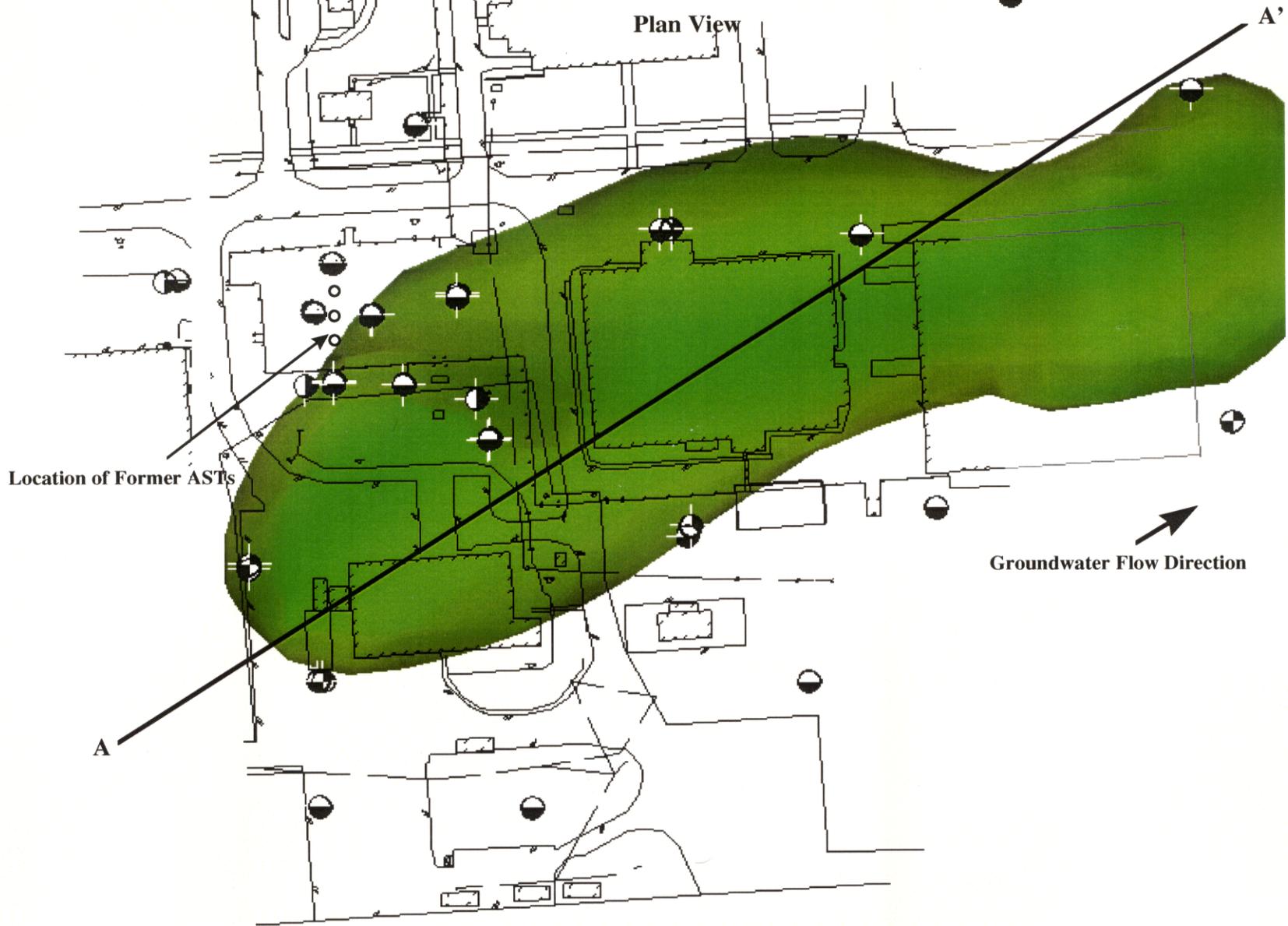


FIGURE 86-3
 RAA 3: NATURAL ATTENUATION GROUNDWATER MONITORING PROGRAM
 SITE 86, TANK AREA AS419-AS421 AT MCAS CTO - 0370
 MARINE CORPS AIR STATION, NEW RIVER CAMP LEJEUNE

SOURCE: LANTDIV, OCT. 1991

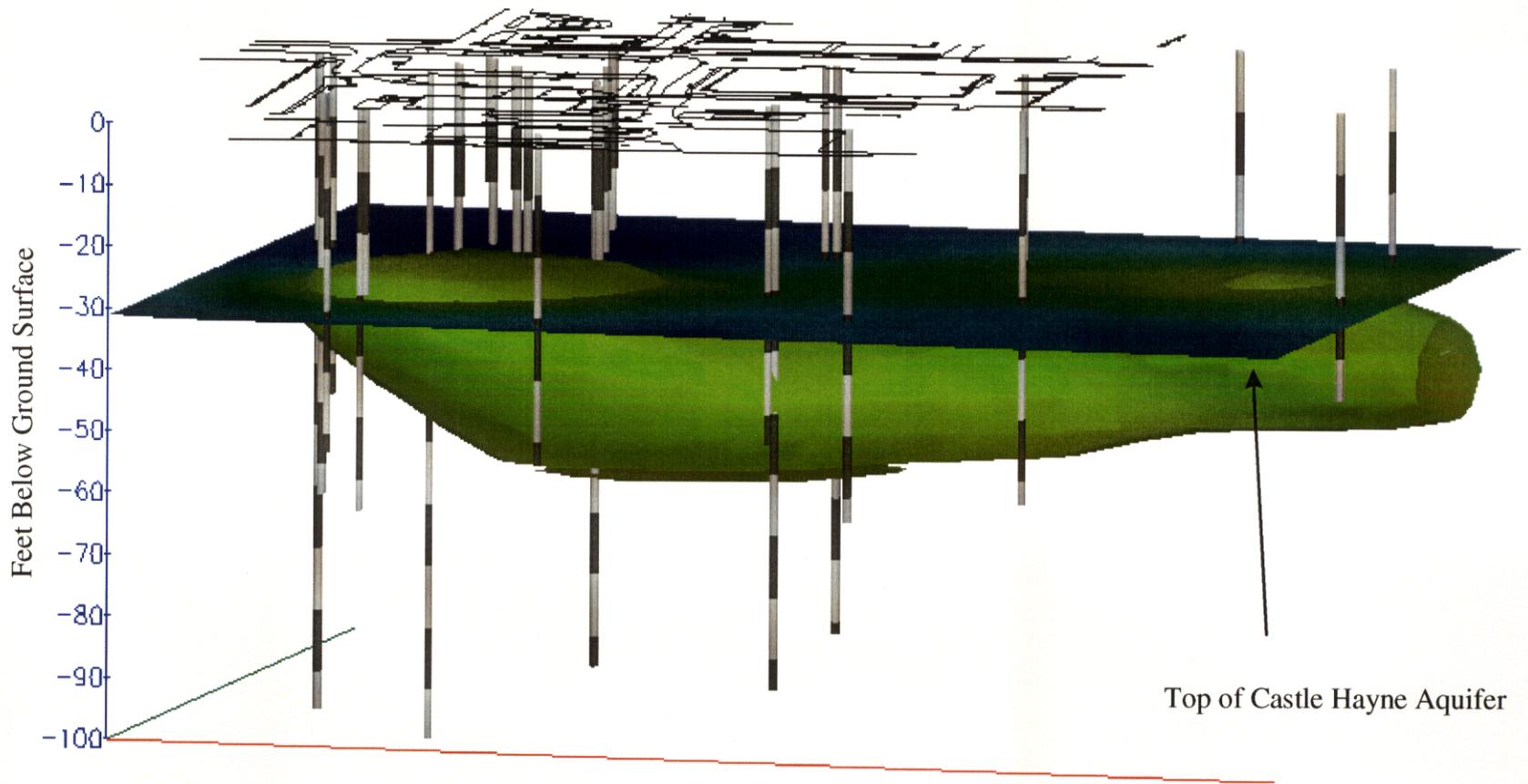
SITE 86
TCE > 2.8 ppb
Plan View



Location of Former ASTs

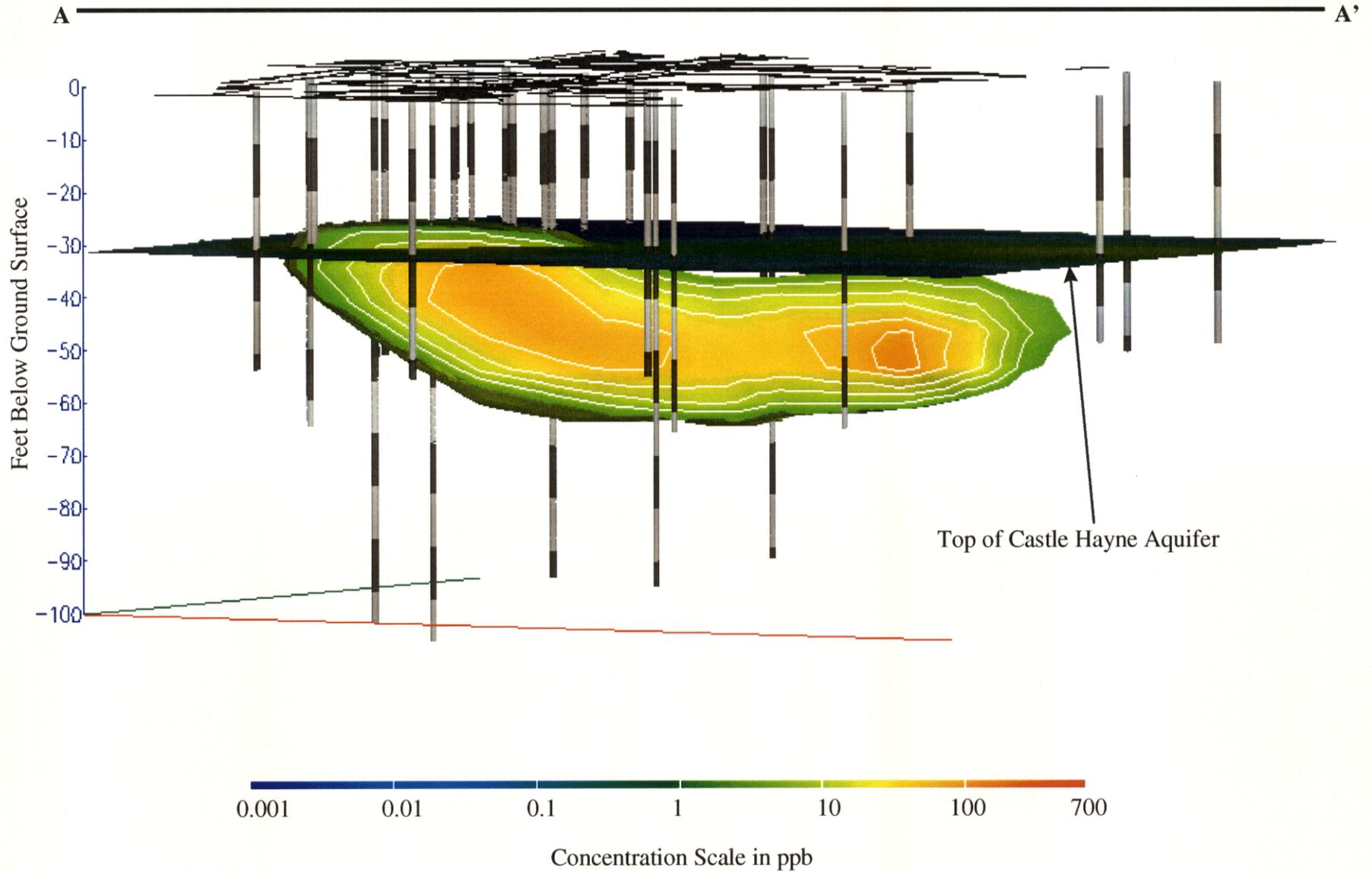
Groundwater Flow Direction

SITE 86
TCE > 2.8 ppb
Side View



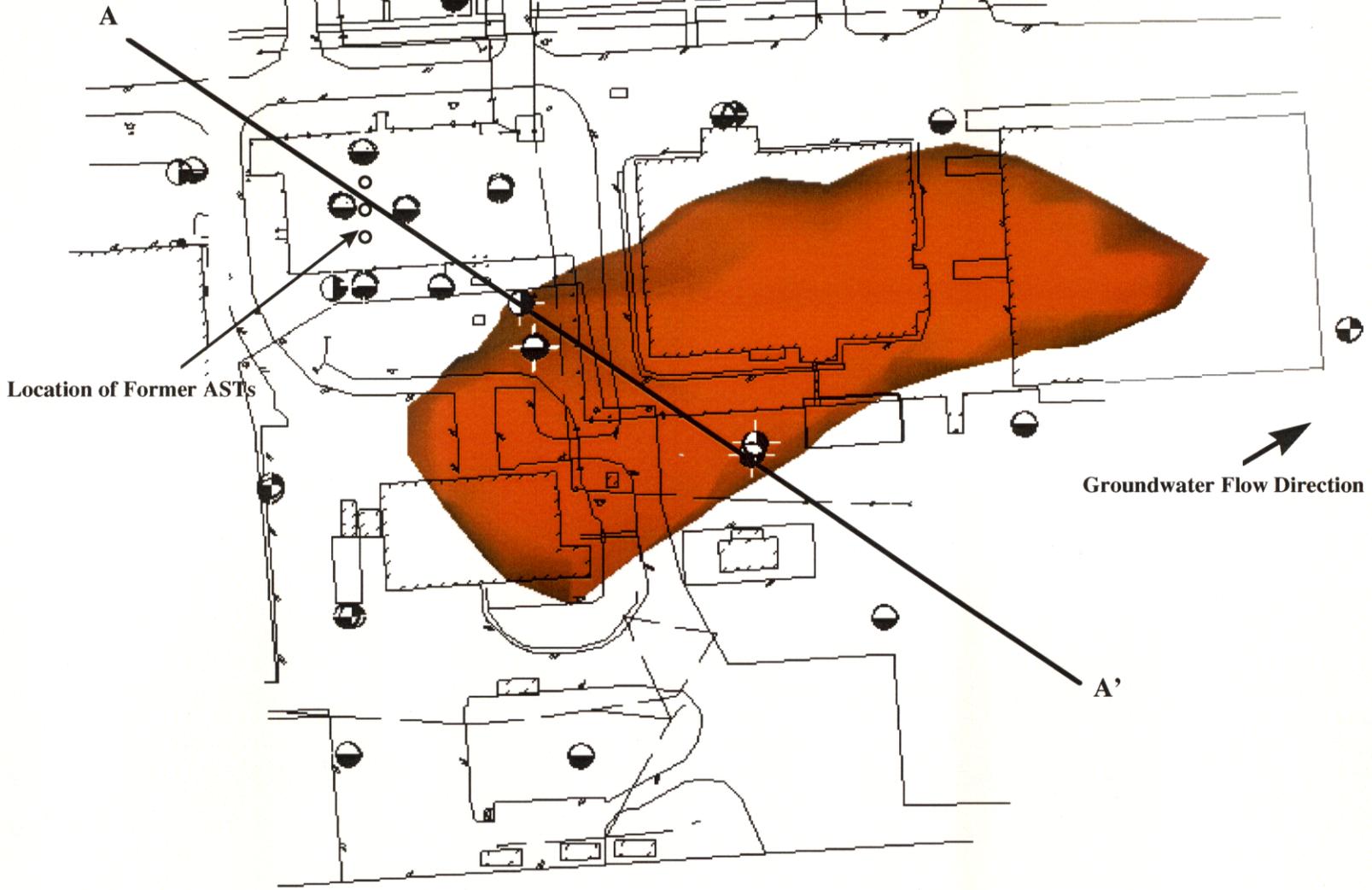
Top of Castle Hayne Aquifer

SITE 86
TCE > 2.8 ppb
Cross-Section A-A'



SITE 86
1,2-DCE > 70 ppb

Plan View



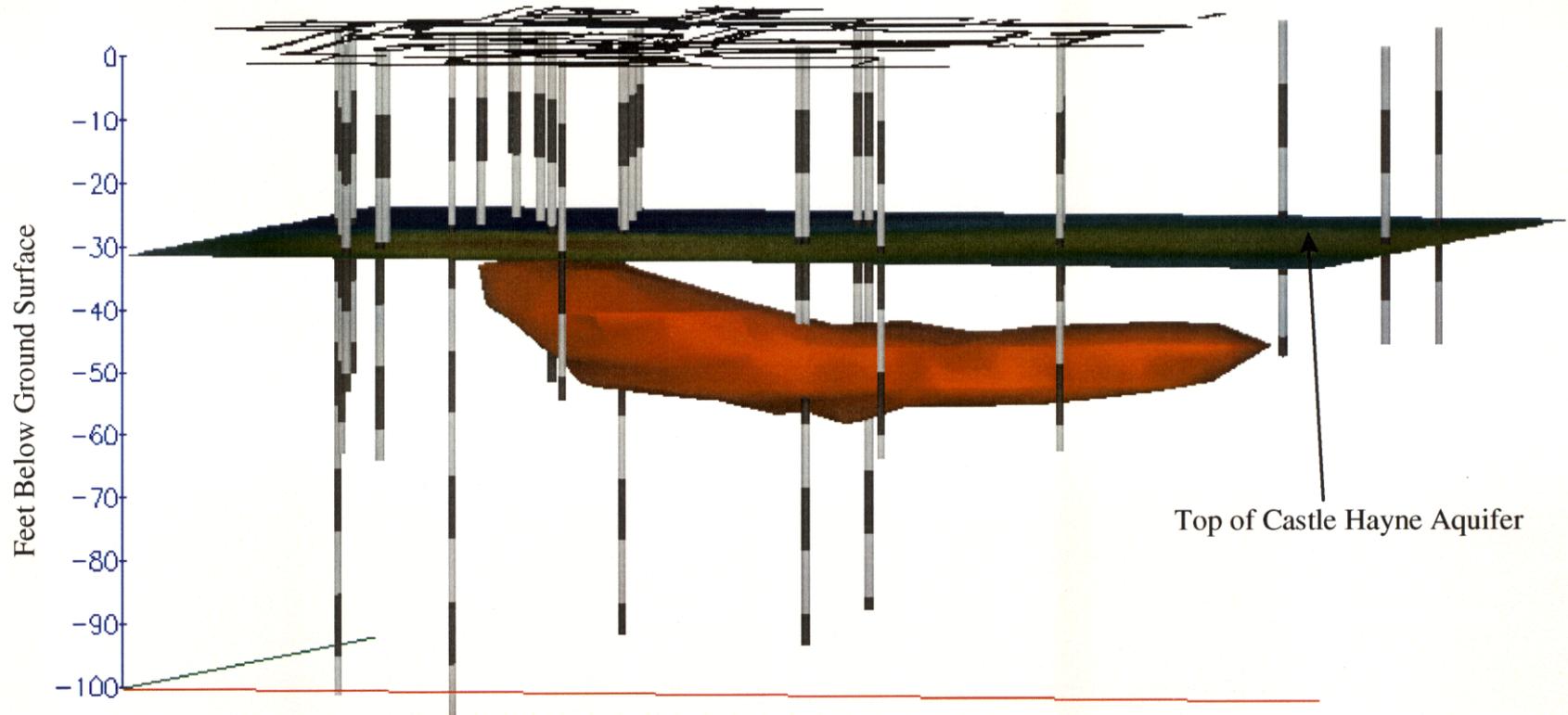
Location of Former ASTs

Groundwater Flow Direction

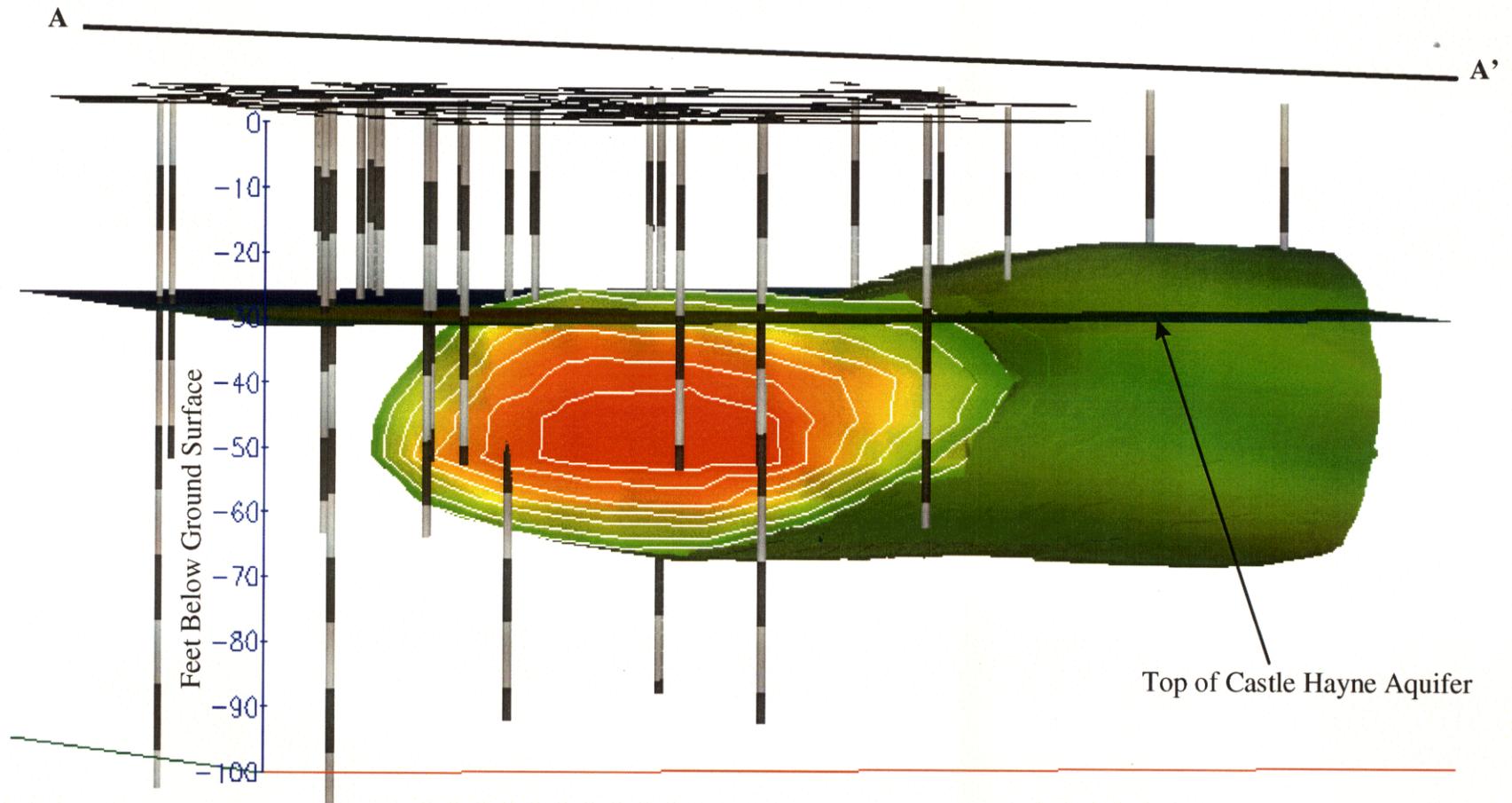
A

A'

SITE 86
1,2-DCE > 70 ppb
Side View



SITE 86
1,2-DCE > 70 ppb
Cross-Section A-A'



APPENDIX A
CHAIN-OF-CUSTODY AND SUMMARY OF ANALYTICAL
RESULTS (JULY AND SEPTEMBER, 1997)



RECRA LabNet Use Only
97076593

Custody Transfer Record/Lab Work Request

Client Baker-Leifune #370
 Project # _____
 Date Rec'd. 7/3/97 Date Dye 7/10/97
 RECRA PM Bosco Ramirez
 Client Contact/Phone Karen Wood

Refrigerator#	5																			
#/Type Container	2/G																			
Volume	40ml																			
Preservative	HCl																			
ANALYSIS REQUESTED	V&A 604H	REDD RCRAT																		
RECRA Use Only Lab ID	Client ID/Description	Matrix	Date Collected																	
001	IR86-GW28IW-01	W	7/1/97	Y	X															
002	IR36-GW17-01	I	7/2/97																	
003	IR36-GW17-01D	I	I																	
004	IR86-GW29IW-01	I	7/1/97																	
005	IR54-GW13-01	I	I																	
006	IR54-GW12-01	I	I																	
007	IR54-GW11-01	I	I																	
008	IR86-GW30IW-01	I	I																	
009	IR36-GW16IW-01	I	7/2/97																	

Matrix: W - Water DS - Drum Solids X - Other Special Instructions:
 S - Soil O - Oil DL - Drum Liquids
 SE - Sediment A - Air F - Fish
 SO - Solid WI - Wipe L - EP/TCLP Leachate
 QC = NFESC
 Delv = NFESC

Internal COC

Item/Reason	Relinquished by	Received by	Date	Time	Item/Reason	Relinquished by	Received by	Date	Time
1-9	P. Bahnd	P. Bahnd Cooker #5	7/3/97	1400 1700					

RECRA LabNet Use Only

Samples Were:
 1 Shipped or Hand-Delivered
 NOTES: FX

2 Ambient or Chilled
 NOTES: (Y) N

3 Received Broken/Leaking (Improperly Sealed)
 NOTES: (Y) N

4 Properly Preserved
 NOTES: (Y) N

5 Received Within Holding Times
 NOTES: (Y) N

COC Tape Was:
 1 Present on Outer Package (Y) N
 2 Unbroken on Outer Package (Y) N
 3 Present on Sample (Y) N
 4 Unbroken on Sample (Y) N
 NOTES:

COC Record Was:
 1 Present Upon Receipt of Samples (Y) N

Discrepancies Between Sample Labels and COC Record? (Y) N
 NOTES: See SDR

Recra LabNet - Chicago (Gulf Coast)

VOLATILES BY GC/MS, HSL LIST

Report Date: 07/10/97 10:57

7110(27)

RFW Batch Number: 9707G593

Client: Baker-Lejeune #370

Work Order: 0000-00-0

Page: 1a

Sample Information	Cust ID:	IR86-GW28IW-			IR36-GW17-01		IR36-GW17-01		IR86-GW29IW-	
		01 -OK	01	01	002 -OK	D 003	01	004		
	RFW#:	001	001 MS	001 MSD						
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:		1	1	1	1	1	1	1	1
	Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Surrogate	1,2-Dichloroethane-d4	99 %	108 %	104 %	102 %	108 %	97 %			
Recovery	Toluene-d8	98 %	102 %	96 %	99 %	103 %	95 %			
	4-Bromofluorobenzene	103 %	107 %	99 %	102 %	107 %	97 %			
Chloromethane		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Bromomethane		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Vinyl chloride		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Chloroethane		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Methylene Chloride		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Acetone		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Carbon Disulfide		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
1,1-Dichloroethene		10 U	114 %	118 %	10 U	10 U	10 U	10 U		
1,1-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
1,2-Dichloroethene (total)		10 U	10 U	10 U	10 U	10 U	10 U	56		
Chloroform		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
1,2-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
2-Butanone		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
1,1,1-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Carbon Tetrachloride		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Bromodichloromethane		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
1,2-Dichloropropane		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
cis-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Trichloroethene		10 U	96 %	95 %	10 U	10 U	10 U	530		
Dibromochloromethane		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
1,1,2-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Benzene		10 U	100 %	101 %	10 U	10 U	10 U	10 U		
trans-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Bromoform		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Tetrachloroethene		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U	10 U	10 U	10 U	10 U		
Toluene		10 U	94 %	94 %	10 U	10 U	10 U	10 U		

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9707G593

Client: Baker-Lejeune #370

Work Order: 0000-00-0

Page: 1b

Cust ID: IR86-GW28IW- IR86-GW28IW- IR86-GW28IW- IR36-GW17-01 IR36-GW17-01 IR86-GW29IW-
 01 01 01 D 01
 RFW#: 001 001 MS 001 MSD 002 003 004

Chlorobenzene	10 U	98 %	98 %	10 U	10 U	10 U
Ethylbenzene	10 U					
Styrene	10 U					
Xylene (total)	10 U					

*= Outside of EPA CLP QC Limits.

412 269 2002;# 4 / 7
 7-10-97 ; 12:17 RECRE LABNET-CHICAGO ;
 SENI BY RECRE LABNET-CHICAGO

Recra LabNet - Chicago (Gulf Coast)
 VOLATILES BY GC/MS, HSL LIST

Report Date: 07/10/97 10:57
 Page: 2a

RFW Batch Number: 9707G593

Client: Baker-Lejeune #370

Work Order: 0000-00-0

Sample Information	Cust ID: IR86-GW29IW-01		IR54-GW13-01		IR54-GW12-01		IR54-GW11-01		IR86-GW30IW-01		IR36-GW16IW-01	
	RFW#:	004 DL	OK 005	006	OK 007	008	009	Matrix:	WATER	WATER	WATER	WATER
D.F.:	5	1	1	1	1	1	1	Units:	ug/L	ug/L	ug/L	ug/L
1,2-Dichloroethane-d4	102	%	104	%	107	%	108	%	103	%	105	%
Surrogate Toluene-d8	95	%	99	%	99	%	103	%	98	%	97	%
Recovery 4-Bromofluorobenzene	99	%	103	%	104	%	106	%	102	%	100	%
Chloromethane	50	U	10	U	10	U	10	U	10	U	10	U
Bromomethane	50	U	10	U	10	U	10	U	10	U	10	U
Vinyl chloride	50	U	10	U	10	U	10	U	10	U	10	U
Chloroethane	50	U	10	U	10	U	10	U	10	U	10	U
Methylene Chloride	50	U	10	U	10	U	10	U	10	U	10	U
Acetone	50	U	10	U	10	U	10	U	10	U	10	U
Carbon Disulfide	50	U	10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethene	50	U	10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethane	50	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethene (total)	50	U	10	U	10	U	10	U	10	U	5	J
Chloroform	50	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethane	50	U	10	U	10	U	10	U	10	U	10	U
2-Butanone	50	U	10	U	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane	50	U	10	U	10	U	10	U	10	U	10	U
Carbon Tetrachloride	50	U	10	U	10	U	10	U	10	U	10	U
Bromodichloromethane	50	U	10	U	10	U	10	U	10	U	10	U
1,2-Dichloropropane	50	U	10	U	10	U	10	U	10	U	10	U
cis-1,3-Dichloropropene	50	U	10	U	10	U	10	U	10	U	10	U
Trichloroethene	600	D	10	U	10	U	10	U	10	U	6	J
Dibromochloromethane	50	U	10	U	10	U	10	U	10	U	10	U
1,1,2-Trichloroethane	50	U	10	U	10	U	10	U	10	U	10	U
Benzene	50	U	10	U	4	J	10	U	10	U	10	U
trans-1,3-Dichloropropene	50	U	10	U	10	U	10	U	10	U	10	U
Bromoform	50	U	10	U	10	U	10	U	10	U	10	U
4-Methyl-2-pentanone	50	U	10	U	10	U	10	U	10	U	10	U
2-Hexanone	50	U	10	U	10	U	10	U	10	U	10	U
Tetrachloroethene	50	U	10	U	10	U	10	U	10	U	10	U
1,1,2,2-Tetrachloroethane	50	U	10	U	10	U	10	U	10	U	10	U
Toluene	50	U	10	U	10	U	10	U	10	U	10	U

*= Outside of EPA CLP QC limits.

RFW Batch Number: 9707G593

Client: Baker-Lejeune #370

Work Order: 0000-00-0

Page: 2b

Cust ID: IR86-GW29IW-01 IR54-GW13-01 IR54-GW12-01 IR54-GW11-01 IR86-GW30IW-01 IR36-GW16IW-01

RFW#:	004 DL	005	006	007	008	009
Chlorobenzene	50 U	10 U	10 U	10 U	10 U	10 U
Ethylbenzene	50 U	10 U	10 U	10 U	10 U	10 U
Styrene	50 U	10 U	10 U	10 U	10 U	10 U
Xylene (total)	50 U	10 U	10 U	10 U	10 U	10 U

* = Outside of EPA CLP QC limits.

412 209 2002, # 07 /
 RECA LABNET-CHICAGO
 12-11 RECA LABNET-CHICAGO
 7-10-97
 RECA LABNET-CHICAGO

Reca LabNet - Chicago (Gulf Coast)

VOLATILES BY GC/MS, HSL LIST

Report Date: 07/10/97 10:57

RFW Batch Number: 9707G593

Client: Baker-Lejeune #370

Work Order: 0000-00-0

Page: 3a

Cust ID: VBLKMD VBLKMD BS

Sample Information	RFW#: 97GVE268-MB1	97GVE268-MB1
	Matrix: WATER	WATER
	D.F.: 1	1
	Units: ug/L	ug/L

Surrogate	1,2-Dichloroethane-d4	102 %	100 %
Recovery	Toluene-d8	101 %	98 %
	4-Bromofluorobenzene	105 %	101 %
Chloromethane	10 U	10 U	
Bromomethane	10 U	10 U	
Vinyl chloride	10 U	10 U	
Chloroethane	10 U	10 U	
Methylene Chloride	10 U	10 U	
Acetone	10 U	10 U	
Carbon Disulfide	10 U	10 U	
1,1-Dichloroethene	10 U	111 %	
1,1-Dichloroethane	10 U	10 U	
1,2-Dichloroethene (total)	10 U	10 U	
Chloroform	10 U	10 U	
1,2-Dichloroethane	10 U	10 U	
2-Butanone	10 U	10 U	
1,1,1-Trichloroethane	10 U	10 U	
Carbon Tetrachloride	10 U	10 U	
Bromodichloromethane	10 U	10 U	
1,2-Dichloropropane	10 U	10 U	
cis-1,3-Dichloropropene	10 U	10 U	
Trichloroethene	10 U	91 %	
Dibromochloromethane	10 U	10 U	
1,1,2-Trichloroethane	10 U	10 U	
Benzene	10 U	100 %	
trans-1,3-Dichloropropene	10 U	10 U	
Bromoform	10 U	10 U	
4-Methyl-2-pentanone	10 U	10 U	
2-Hexanone	10 U	10 U	
Tetrachloroethene	10 U	10 U	
1,1,2,2-Tetrachloroethane	10 U	10 U	
Toluene	10 U	94 %	

*= Outside of EPA CLP QC Limits.

RFW Batch Number: 9707G593

Client: Baker-Lejeune #370

Work Order: 0000-00-0

Page: 3b

Cust ID: VBLKMD

VBLKMD BS

RFW#: 97GVE268-MB1 97GVE268-MB1

Chlorobenzene	10	U	96	%
Ethylbenzene	10	U	10	U
Styrene	10	U	10	U
Xylene (total)	10	U	10	U

* = Outside of EPA CLP QC limits.



RECRA LabNet Use Only ¹⁹²⁷
97091275 236 Custody Transfer Record/Lab Work Request
 CAMP LEJEUNE

Client BAKER ENVIRONMENTAL	Refrigerator # 1												
Est. Final Proj. Sampling Date 9/11/97	M/Type Container Liquid 2/50 ML												
Project # 62470-370 TO FOLLOW	Solid												
Project Contact/Phone # R. BOWELL	Volume Liquid 40 ML												
RECRA Project Manager +121269-2663 GD	Solid												
OC CLP Del CLP TAT 2 DAY	Preservatives HCL												
Date Rec'd 9-9-97 Date Due 9-11-97	ANALYSES REQUESTED →												
Account # 641PM	<table border="1"> <tr> <td>VOA</td> <td>BNA</td> <td>Pes/PCB</td> <td>Herb</td> <td colspan="2">INORG</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>Metal</td> <td>CN</td> </tr> </table>	VOA	BNA	Pes/PCB	Herb	INORG						Metal	CN
VOA	BNA	Pes/PCB	Herb	INORG									
				Metal	CN								

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate W - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only									
			MS	MSD				1	2	3	4	5	6				
	001	IRBG-6W16TW-97C			W	9/7/97	1730	✓									48 HR TURNAROUND
	002	UST428-6W06-97C			W	9/7/97	1912	✓									48 HR TURNAROUND
	003	IRBG-TA-97C			W	9/7/97	1735	✓									STANDARD TURNAROUND
	004	HOLDING BLANK			L	9/5/97	1130	✓									

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS				DATE/REVISIONS:				RECRA LabNet Use Only			
Special Instructions: * Holding Blank added to coc in lab.				1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____				Samples were: 1) Shipped <input checked="" type="checkbox"/> or Hand Delivered Package Y or N 2) Ambient or Chilled Airbill # 615104126 Package Y or N 3) Received in Good Condition Y or N 4) Labels Indicate Properly Preserved Y or N 5) Received Within Holding Times Y or N COC Tape was: 1) Present on Outer Package <input checked="" type="checkbox"/> 2) Unbroken on Outer Package Y or N 3) Present on Sample Y or N 4) Unbroken on Sample Y or N COC Record Present Upon Sample Rec't Y or N			
Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time	Discrepancies Between Samples Labels and COC Record? Y or N			
EJK	Fed Ex	9/6/97						NOTES: *			
Fed Ex		9/9/97	(1000)								

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS

Report Date: 09/11/97 13:34

RFW Batch Number: 9709L236

Client: BAKER-CAMP LEJHUME

Work Order: 99999999999

Page: 1a

Cust ID: IR86-GW161W-97C UST428-GW06-97C IR86-TB-97C IR86-TB-97C IR86-TB-97C HOLDING BLAN K

Sample Information	RFW#:	001	002	003	003 MS	003 MSD	004
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L
Surrogate	Toluene-d8	103 %	104 %	104 %	107 %	103 %	104 %
Recovery	Bromofluorobenzene	104 %	104 %	103 %	106 %	102 %	105 %
	1,2-Dichloroethane-d4	96 %	100 %	101 %	110 %	97 %	98 %
		fl	fl	fl	fl	fl	fl
Chloromethane		10 U	10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride		10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride		2 JB	2 JB	3 JB	3 JB	10 JB	5 JB
Acetone		10 U	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide		10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	10 U	99 %	94 %	10 U
1,1-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		3 J	50	10 U	10 U	10 U	10 U
Chloroform		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
2-Butanone		10 U	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride		10 U	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene		2 J	2 J	10 U	87 %	85 %	10 U
Dibromochloromethane		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Benzene		10 U	3 J	10 U	98 %	94 %	10 U
Trans-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U	10 U
Bromoform		10 U	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene		10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U	10 U	10 U	10 U
Toluene		10 U	10 U	10 U	99 %	96 %	10 U

*= Outside of EPA CLP QC limits.

T-859 P.02/05 Job-717

5107016141

SEP-11-97 14:06 From: RECRA ENVIRONMENTAL

Cust ID: IR86-GW16IW- UST428-GW06- IR86-TB-97C IR86-TB-97C IR86-TB-97C HOLDING BLAN
 97C 97C K
 RFW#: 001 002 003 003 MS 003 MSD 004

	001	002	003	003 MS	003 MSD	004
Chlorobenzene	10 U	10 U	10 U	98 %	95 %	10 U
Ethylbenzene	10 U	10 U	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U	10 U
Xylene (total)	10 U	10 U	10 U	10 U	10 U	10 U

*= Outside of EPA CLP QC limits.

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS

Report Date: 09/11/97 13:34

RFW Batch Number: 9709L236

Client: BAKER-CAMP LEJHUNE

Work Order: 9999999999

Page: 2a

Cust ID: VBLKUG VBLKUG BS VBLKTU VBLKTU BS

Sample Information	RFW#: 97LVK194-MB1	97LVK194-MB1	97LVK193-MB1	97LVK193-MB1
	Matrix: WATER	WATER	WATER	WATER
	D.F.: 1.00	1.00	1.00	1.00
	Units: UG/L	UG/L	UG/L	UG/L

Surrogate	Toluene-d8	102 %	106 %	99 %	101 %
Recovery	BromoFluorobenzene	100 %	103 %	93 %	97 %
	1,2-Dichloroethane-d4	97 %	96 %	97 %	95 %
Chloromethane	10 U	10 U	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	2 J	3 JB	2 J	2 JB	2 JB
Acetone	10 U	10 U	10 U	10 U	10 U
Carbon Disulfide	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	10 U	95 %	10 U	93 %	93 %
1,1-Dichloroethane	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)	10 U	10 U	10 U	10 U	10 U
Chloroform	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	10 U	10 U	10 U	10 U	10 U
2-Butanone	10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane	10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride	10 U	10 U	10 U	10 U	10 U
Bromodichloromethane	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U
Trichloroethene	10 U	98 %	10 U	90 %	90 %
Dibromochloromethane	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	10 U	10 U	10 U	10 U	10 U
Benzene	10 U	103 %	10 U	97 %	97 %
Trans-1,3-Dichloropropene	10 U	10 U	10 U	10 U	10 U
Bromoform	10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U	10 U	10 U
Tetrachloroethene	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	10 U	10 U	10 U	10 U	10 U
Toluene	10 U	103 %	10 U	98 %	98 %

*= Outside of EPA CLP QC limits.

T-859 P.04/05 Job-717

6107016141

SEP-11-97 14:07 From: RECRA ENVIRONMENTAL

Cust ID: VBLKUG

VBLKUG BS

VBLKTU

VBLKTU BS

RFW#: 97LVK194-MB1

97LVK194-MB1

97LVK193-MB1

97LVK193-MB1

Chlorobenzene	10	U	101	%	10	U	97	%
Ethylbenzene	10	U	10	U	10	U	10	U
Styrene	10	U	10	U	10	U	10	U
Xylene (total)	10	U	10	U	10	U	10	U

*= Outside of EPA CLP QC limits.

T-859 P.05/05 Job-717

6107016141

SEP-11-97 14:07 From: RECRA ENVIRONMENTAL



RECRA LabNet Use Only
9709L 397

Custody Transfer Record/Lab Work Request

CAMP LAJEUNE

Client BAKER ENVIRONMENTAL	Refrigerator #	1														
Est. Final Proj. Sampling Date 9/17/97	#/Type Container	Liquid 26L														
Project # 62470-370-500 BROW		Solid														
Project Contact/Phone # R. DONNELLI / CHAZZ	Volume	Liquid 40														
RECRA Project Manager G.D.		Solid														
OC CLP Del CLP TAT 7 DAY	Preservatives	NEU														
Date Rec'd 9-18-97 Date Due 9-25-97	ANALYSES REQUESTED →	<table border="1"> <tr> <th colspan="5">ORGANIC</th> <th colspan="2">INORG</th> </tr> <tr> <td>VOA</td> <td>BNA</td> <td>Pest/PCB</td> <td>Herb</td> <td></td> <td>Metal</td> <td>N</td> </tr> </table>	ORGANIC					INORG		VOA	BNA	Pest/PCB	Herb		Metal	N
ORGANIC					INORG											
VOA	BNA	Pest/PCB	Herb		Metal	N										
Account # GM/PM																

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/TCLP Leachate WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Matrix	Date Collected	Time Collected	RECRA LabNet Use Only										
			MS	MSD														
	001	IR86-GW29TW-97C			W	9/17/97	1505	✓										
	2	IR86-GW31ZW-97C			W	"	1317	✓										
	3	IR86-T801-97C			W	"	1320	✓										
	4	IR86-GW29ZW-97C			W	"	1505	✓										
	005	HOLDING BLANK			W	9/17/97	-	✓										

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
COC # 370-002
Fed Ex Air Bill # 6757134915
5:30C

DATE/REVISIONS:
→ 1. WO # -00010-010-097-6035-00
→ 2. HOLDING BLANK APPROVED
3. ABCIT
4.
5.
6.

RECRA LabNet Use Only

Samples were: 1) Shipped <input checked="" type="checkbox"/> or Hand Delivered	COC Tape was: 1) Present on Outer Package <input checked="" type="checkbox"/> or N
Airbill # 6757134915	2) Ambient or Filled Package <input checked="" type="checkbox"/> or N
2) Ambient or Filled	3) Present on Sample Condition <input checked="" type="checkbox"/> or N
3) Received in Good Condition	4) Unbroken on Sample Y or N
4) Labels Indicate Properly Preserved	5) Received Within Holding Times <input checked="" type="checkbox"/> or N
5) Received Within Holding Times	COC Record Present Upon Sample Rec'l <input checked="" type="checkbox"/> or N

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
ETK	Fed Ex	9/17/97	1800				
Fed Ex		9/18/97	930A				

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Recra LabNet - Lionville Laboratory

Volatiles by GC/MS

Report Date: 09/25/97 17:30

RFW Batch Number: 9709L397

Client: BAKER-CAMP LEJEUNE

Work Order: 00010010097

Page: 1a

Sample Information	Cust ID: IR86-GW29IW-		IR86-GW29IW-		IR86-GW31IW-		IR86-TB01-97		IR86-GW29IWD		IR86-GW29IWD	
	97C		97C		97C		C		-97C		-97C	
	RFWH:	001	001 DL	002	003	004	004 DL					
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER					
D.F.:	1.00	5.00	1.00	1.00	1.00	5.00						
Units:	UG/L	UG/L	UG/L	UG/L	UG/L	UG/L						
Surrogate	Toluene-d8	93 %	99 %	89 %	106 %	91 %	100 %					
Recovery	Bromofluorobenzene	91 %	98 %	86 %	102 %	88 %	100 %					
	1,2-Dichloroethane-d4	99 %	105 %	97 %	108 %	95 %	108 %					
		fl	fl	fl	fl	fl	fl					
	Chloromethane	10 U	50 U	10 U	10 U	10 U	50 U					
	Bromomethane	10 U	50 U	10 U	10 U	10 U	50 U					
	Vinyl Chloride	2 J	50 U	10 U	10 U	2 J	50 U					
	Chloroethane	10 U	50 U	10 U	10 U	10 U	50 U					
	Methylene Chloride	1 BJ	22 BJD	2 BJ	2 BJ	1 BJ	27 BJD					
	Acetone	10 U	50 U	10 U	10 U	10 U	50 U					
	Carbon Disulfide	10 U	50 U	10 U	10 U	10 U	50 U					
	1,1-Dichloroethene	10 U	50 U	10 U	10 U	10 U	50 U					
	1,1-Dichloroethane	10 U	50 U	10 U	10 U	10 U	50 U					
	1,2-Dichloroethene (total)	73	67 D	2 J	10 U	69	70 D					
	Chloroform	10 U	50 U	10 U	10 U	10 U	50 U					
	1,2-Dichloroethane	10 U	50 U	10 U	10 U	10 U	50 U					
	2-Butanone	10 U	50 U	10 U	10 U	10 U	50 U					
	1,1,1-Trichloroethane	10 U	50 U	10 U	10 U	10 U	50 U					
	Carbon Tetrachloride	10 U	50 U	10 U	10 U	10 U	50 U					
	Bromodichloromethane	10 U	50 U	10 U	10 U	10 U	50 U					
	1,2-Dichloropropane	10 U	50 U	10 U	10 U	10 U	50 U					
	cis-1,3-Dichloropropene	10 U	50 U	10 U	10 U	10 U	50 U					
	Trichloroethene	740 E	700 D	9 J	10 U	670 E	690 D					
	Dibromochloromethane	10 U	50 U	10 U	10 U	10 U	50 U					
	1,1,2-Trichloroethane	10 U	50 U	10 U	10 U	10 U	50 U					
	Benzene	10 U	50 U	10 U	10 U	10 U	50 U					
	Trans-1,3-Dichloropropene	10 U	50 U	10 U	10 U	10 U	50 U					
	Bromoform	10 U	50 U	10 U	10 U	10 U	50 U					
	4-Methyl-2-pentanone	10 U	50 U	10 U	10 U	10 U	50 U					
	2-Hexanone	10 U	50 U	10 U	10 U	10 U	50 U					
	Tetrachloroethene	10 U	50 U	10 U	10 U	10 U	50 U					
	1,1,2,2-Tetrachloroethane	10 U	50 U	10 U	10 U	10 U	50 U					
	Toluene	10 U	50 U	10 U	10 U	10 U	50 U					

*= Outside of EPA CLP QC limits.

SEP-25-97 18:25 FROM:RECRA ENVIRONMENTAL

6107016141

T-303 P.02/05 Job-558

	Cust ID: IR86-GW29IW-		IR86-GW29IW-		IR86-GW31IW-		IR86-TB01-97		IR86-GW29IWD		IR86-GW29IWD	
	97C		97C		97C		C		-97C		-97C	
RFW#:	001		001 DL		002		003		004		004 DL	
Chlorobenzene	10	U	50	U	10	U	10	U	10	U	50	U
Ethylbenzene	10	U	50	U	10	U	10	U	10	U	50	U
Styrene	10	U	50	U	10	U	10	U	10	U	50	U
Xylene (total)	10	U	50	U	10	U	10	U	10	U	50	U

*= Outside of EPA CLP QC limits.

Recre LabNet - Lionville Laboratory

Volatiles by GC/MS

Report Date: 09/25/97 17:30

RFW Batch Number: 9709L397

Client: BAKER-CAMP LEJEUNE

Work Order: 00010010097

Page: 2a

Sample Information	Cust ID: HOLDING BLAN	VBLKXE	VBLKXE BS	VBLKXF	VBLKXG	
	K					
RFW#:	005	97LVC180-MB1	97LVC180-MB1	97LVC181-MB1	97LVC184-MB1	
Matrix:	WATER	WATER	WATER	WATER	WATER	
D.F.:	1.00	1.00	1.00	1.00	1.00	
Units:	UG/L	UG/L	UG/L	UG/L	UG/L	
Surrogate	Toluene-d8	92 %	99 %	93 %	93 %	98 %
Recovery	Bromofluorobenzene	89 %	99 %	95 %	96 %	96 %
	1,2-Dichloroethane-d4	94 %	110 %	103 %	101 %	99 %
-----f1-----f1-----f1-----f1-----f1-----f1-----						
Chloromethane		10 U	10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U	10 U
Vinyl Chloride		10 U	10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U	10 U
Methylene Chloride		13 B	2 J	3 BJ	4 J	1 J
Acetone		10 U	10 U	10 U	10 U	10 U
Carbon Disulfide		10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene		10 U	10 U	100 %	10 U	10 U
1,1-Dichloroethane		10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethene (total)		10 U	10 U	10 U	10 U	10 U
Chloroform		10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane		10 U	10 U	10 U	10 U	10 U
2-Butanone		10 U	10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		10 U	10 U	10 U	10 U	10 U
Carbon Tetrachloride		10 U	10 U	10 U	10 U	10 U
Bromodichloromethane		10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane		10 U	10 U	10 U	10 U	10 U
cis-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U
Trichloroethene		10 U	10 U	97 %	10 U	10 U
Dibromochloromethane		10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane		10 U	10 U	10 U	10 U	10 U
Benzene		10 U	10 U	95 %	10 U	10 U
Trans-1,3-Dichloropropene		10 U	10 U	10 U	10 U	10 U
Bromoform		10 U	10 U	10 U	10 U	10 U
4-Methyl-2-pentanone		10 U	10 U	1 J	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U	10 U
Tetrachloroethene		10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane		10 U	10 U	10 U	10 U	10 U
Toluene		10 U	10 U	91 %	10 U	10 U

*= Outside of EPA CLP QC limits.

SEP-25-97 18:25 FROM: RECREA ENVIRONMENTAL

6107016141

T-303 P 04/05 Job-558

	Cust ID: HOLDING BLAN	VBLKXE	VBLKXE BS	VBLKXF	VBLKKG
	K				
RFW#:	005	97LVC180-MB1	97LVC180-MB1	97LVC181-MB1	97LVC184-MB1
Chlorobenzene	10 U	10 U	92 †	10 U	10 U
Ethylbenzene	10 U	10 U	10 U	10 U	10 U
Styrene	10 U	10 U	10 U	10 U	10 U
Xylene (total)	10 U	10 U	10 U	10 U	10 U

*= Outside of EPA CLP QC limits.