

5/1/00-04098

FINAL
DYE TRACE STUDY REPORT
CAMP GEIGER AIR SPARGE TRENCH
MARINE CORPS BASE CAMP LEJEUNE
ONslow COUNTY, NORTH CAROLINA

Prepared for:

DEPARTMENT OF THE NAVY
Contract No. N62470-93-D-3032
Delivery Order No. 0083

Atlantic Division
Naval Facilities Engineering Command
6506 Hampton Boulevard
Building A (South East Wing) 3rd Floor

Prepared by:



**OHM Remediation
Services Corp.**

A member of THE IT GROUP

11560 Great Oaks Way, Suite 500
Alpharetta, GA 30002

May 2000

OHM Project No. 917536

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Norfolk, VA 23508

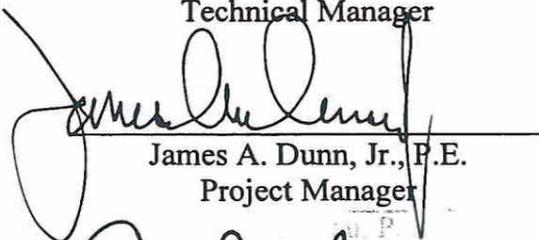
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May 2000

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1 INTRODUCTION

A plume of dissolved chlorinated solvents, primarily composed of trichloroethene (TCE), has been delineated at Camp Geiger, Site 35, OU10 (Appendix A, Figure 1). In January and February 1998, OHM Remediation Services Corp. (OHM) installed a pilot air sparge trench 40 feet deep by 100 feet long to test this method of remediating the plume. In this design, compressed air is injected into slotted pipe running the length of the bottom of the trench. This theoretically forms an air curtain, rising to the ground surface. As contaminated groundwater migrates through the curtain, the air bubbles should volatilize and remove the chlorinated hydrocarbons from the shallow aquifer.

The trench has been in operation since March 1998. At the time the trench was installed, several pairs of 2-inch inside diameter (ID) piezometers were installed in the vicinity of the trench to test the efficacy of the trench (Figure 2, Original Site Map). Baseline groundwater samples from these piezometers indicated that almost all of the chlorinated hydrocarbons were in the lower portion of the shallow aquifer, 30 to 40 feet below ground surface (bgs). Since start up, samples have been periodically collected from the piezometers. Analytical results indicate that the concentrations of chlorinated hydrocarbons in groundwater samples from deep piezometers within the trench and immediately downgradient have generally declined. This suggests that the trench is effective in remediating the shallow aquifer.

Concerns were raised that the operation of the trench might be creating an "air dam," forcing groundwater around the trench to either side rather than through the curtain of air bubbles. A review of the literature on air sparge trenches did not indicate any studies examining groundwater flow patterns in the vicinity of an active trench. In addition, operation of the trench has created water level anomalies in monitoring wells near the trench. At times, wells installed in the trench have exhibited artesian flow. As a result, traditional methods of inferring the direction of groundwater flow from the slope of the potentiometric surface could not be used.

To alleviate the aforementioned concerns, it was decided that a dye trace test should be performed. Fluorescein dye would be introduced into the lower portion of the shallow aquifer a short distance upgradient of the trench. Pairs of monitoring wells installed in the immediate vicinity would be regularly monitored for fluorescein. From its appearance in various wells, the influence of the air sparge trench on localized groundwater flow patterns would be inferred.

A draft Work Plan was prepared and submitted to LANTDIV and the State of North Carolina Department of Environment and Natural Resources (DENR).

2 WELL INSTALLATION

Following approval of a revised Work Plan in November 1999, OHM mobilized to the site on December 6, 1999. An injection well (IP-1) was installed 5 feet upgradient of deep monitoring piezometer OP-2D. This piezometer is located in the trench with its screened interval directly above the slotted air sparge pipe. Four deep temporary observation wells (OB-1D through OB-4D) were installed nearby (Figure 3, Dye Trace Study Map). OB-1D was located where it would detect flow reversal due to trench operation. OB-2D and OB-3D were sited where they would detect lateral flow around the end of the trench. OB-4D was located where it would detect continued migration downgradient of the air sparge trench. The screened intervals of the injection well and all deep wells that were sampled during the study are shown in Table 1.

All deep wells were installed with 5 feet of screen in the lower portion of the shallow aquifer. The maximum drilling depth for the deep wells was selected so as to coincide as closely as possible with the bottom of the air sparge trench. During drilling, the lithology was observed from drill cuttings and from select split-spoon samples collected from the lower portion of the shallow aquifer. From the surface to 30-32 feet bgs the formation was a tan, medium sand. Underlying the sand to the maximum depth drilled was a light gray friable limestone, which frequently contained numerous shell fragments. Photograph 1 (in Appendix C) shows a typical split-spoon sample of the limestone.

A shallow, temporary observation well was installed as close as possible to each deep observation well. These wells (OB-1S through OB-4S) were installed in the upper portion of the shallow aquifer, with 10 feet of screen bisecting the water table. Photograph 2 shows the layout of the wells as observed from the southeastern end of the air sparge trench.

Following installation, dedicated tubing was installed in each well scheduled for periodic sampling. This tubing was used to facilitate groundwater purging and collection. After the tubing was installed, the top of each casing was sealed to prevent introduction of contaminants.

3 DYE INJECTION

As described in the Work Plan, fluorescein dye (CI acid yellow 73) is a safe tracer that has been used in many dye trace studies. Based upon groundwater samples collected in November 1999 from four existing wells in and near the air sparge trench (OP-1D, OP-1S, MP-3D and MP-3S), it was determined that there were no background concentrations of fluorescein in the shallow aquifer at the site. (Appendix D contains a copy of the analytical results). For these reasons, fluorescein was selected as the dye to be used in the study.

Installation and development of the injection well and all eight new monitoring wells was completed by the evening of Thursday December 9. On the morning of Friday December 10, the fluorescein was introduced into the lower portion of the shallow aquifer through the injection well as follows. Teflon tubing with an inside diameter of 3/8 inch was lowered into IP-1 until it was 6 inches above the bottom. The tubing was connected to a peristaltic pump, which was then connected to a plastic jug containing 1 gallon of a 20 percent solution of fluorescein in distilled water (see Photograph 3). At this concentration, fluorescein is bright red rather than green (see Photograph 4). As the pump gradually introduced the dye into the well, the downhole mouth of the tubing was raised and lowered through the 5-foot screened interval to improve the distribution of the dye.

Once the entire gallon of dye had been injected, the tubing was flushed with one gallon of distilled water to ensure that all the dye had been delivered to the well. A tight-fitting plug was inserted into the well and gradually lowered while additional distilled water was added above it to provide further (though gentle) impetus for the dye to move into the filter pack and formation. The plug was lowered until the bottom of the trapped air column was 5 feet above the top of the screened interval. Calculations performed prior to injection indicated that this procedure would force the dye no further than 1 foot from the injection well. Once the plug had been advanced to the appropriate depth the top of the injection well was sealed with an expandable, locking J plug.

4 MONITORING AND SAMPLE COLLECTION

Given the close spacing of the observation wells, it was important to keep the disturbance of indigenous groundwater flow pathways to a minimum. For this reason, the wells were purged and sampled with a peristaltic pump.

A baseline (zero hour) groundwater sample was collected from each monitoring well the morning of December 10, 1998. Photograph 5 shows a typical sample vial. With the exception of a very low concentration of fluorescein in OB-4S (0.068 ppb), all samples were nondetectable for fluorescein (Table 2). The fluorescein detected in OB-4S during the baseline sampling was regarded as a background concentration unrelated to the study.

Samples were collected at various intervals following injection. The schedule was designed to ensure that unusually rapid diffusion due to turbulent flow near the trench could be analyzed. A groundwater sample was collected from each observation well at the following times following injection:

12 hours	4 days	8 days	20days
1 day	5 days	9 days	30 days
2 days	6 days	10 days	40 days
3 days	7 days	14 days*	50 days

*Day 15 was Christmas

All samples were shipped to the laboratory of Crawford and Associates, Inc. in Bowling Green, Kentucky, for analysis for fluorescein. A Shimadzu Spectrofluorophotometer Model RF 5301U was used to analyze both the excitation and emission maxima of fluorescent dyes. This method of analyzing samples from a broad band of the spectrum in the synchronous scanning mode improved the sensitivity and selectivity of the analysis compared to a single emission or excitation scan (Duley, 1986). Each round of analyses included a distilled water sample and a sample containing a known amount of fluorescein for quality control purposes.

5 ANALYTICAL RESULTS AND INTERPRETATION

Analytical results for all samples collected since dye injection are summarized in Table 2. Copies of original analytical reports are included in Appendix D.

With the exception of OB-4S and MP-5S, no fluorescein was detected in any groundwater samples from any shallow monitoring wells. The concentrations of fluorescein in OB-4S and MP-5S were very low (with one exception less than 100 parts per trillion [ppt]). They did not exhibit a steady increase over time, which is the typical behavior of migrating fluorescein in an isotropic medium (such as the unconsolidated sediments that form the matrix of the shallow

aquifer at Camp Geiger). Fluorescein was present in OB-4S during the zero hour sampling event, so it could not have come from the injected dye.

For these reasons, the fluorescein detected in these two wells was regarded as unrelated to that released for the dye trace study. It could have come from a previous surface release of a small amount of antifreeze. The absence of study-related fluorescein in groundwater from any of the shallow wells suggests that there is little or no upward groundwater flow, even in the active air sparge trench.

No fluorescein was detected in any groundwater samples from wells OB-1D (the upgradient observation well); OB-2D; or OB-3D (the lateral observation wells southeast of the injection well). Based on these results, it does not appear that operation of the air sparge trench causes groundwater flow to back up or to be diverted laterally around the southeast end of the trench.

Fluorescein began appearing in groundwater samples from well OP-2D seven days after injection. The initial concentration was 35 ppt. OP-2D, which is installed in the air sparge trench, is 5 feet from IP-1 in the presumed direction of groundwater migration under static conditions, which is approximately N45E. The concentration of fluorescein in groundwater samples from this well increased steadily up to day 14, at which time it was 6,933 ppt. Fluorescein concentrations persisted at this level through day 30, after which they declined to 1,083 ppt on day 50.

The next deep well in the presumed downgradient direction from OP-2D was OB-4D, which was 5 feet further away from the injection well. Fluorescein began appearing in groundwater samples from this well 14 days after injection. The concentrations of fluorescein in groundwater samples from this well increased steadily up to day 30, at which time it was 3,253 ppt. Subsequently, fluorescein concentrations in groundwater samples from this well declined to 622 ppt on day 50.

When fluorescein began appearing in OB-4D, piezometer MP-5D was added to the sampling schedule. This well is 10 feet further northeast from OB-4D. It is also 5 feet southeast of a line connecting IP-1, OP-2D and OB-4D. Low levels of fluorescein (22 ppt) began appearing in this well on day 40. By day 50, the levels had increased slightly to 74 ppt.

The day 50 samples were collected concurrently with the monthly collection of groundwater samples of existing piezometers for analysis of chlorinated hydrocarbon concentrations.

During sample collection, Mr. Mark Martin, OHM Field Chemist, noticed that there was a green tint to the groundwater being purged from MP-3D. This well is 5 feet downgradient from the air sparge trench and approximately 60 feet N30W of the injection well (see Figure 3). Mr. Martin collected a sample from this well and included it in the samples that were sent to Crawford and Associates for analysis. The sample contained 50,000 ppt fluorescein, which was an order of magnitude greater than any other detection in any other well. A repeat sample collected on day 63 contained 170,100 ppt fluorescein.

Due to the high levels of detection in MP-3D, a groundwater sample was collected from OP-1D on day 61. OP-1D is 5 feet southwest of MP-3D in the air sparge trench. This sample contained 83 ppt fluorescein. A repeat sample collected on day 63 contained 132 ppt fluorescein. Initially, it was difficult to resolve the disparity in two wells located in such close proximity. However, OP-1D is screened from 28 to 33 feet bgs, whereas the injection well is screened from 36 to 41 feet bgs and MP-3D is screened from 40 to 45 feet bgs. This appears to provide further confirmation that there is virtually no upward flow in the shallow aquifer, even as groundwater passes through the air sparge trench.

Based on the rate of fluorescein appearance in wells OP-2D and OB-4D, it was calculated that the rate of groundwater migration in this direction was approximately 0.7 foot per day (10 feet from IP-1 to OB-4 divided by 14 days). The green tint observed in MP-3D on day 50 was not observed during the previous sampling event in that well, which was on December 23, 1999 (day 13). Therefore, the rate of groundwater migration from IP-1 towards MP-3D was greater than 1.2 feet per day (60 feet from IP-1 to MP-3D divided by 50 days), but less than 4.6 feet per day (same distance divided by 13 days).

6 CONCLUSIONS AND RECOMMENDATIONS

Based upon hydrogeologic studies performed prior to installation of the air sparge trench, the direction of groundwater migration under static conditions was inferred to be approximately N45E. Three hypotheses had been suggested for the influence of the air sparge trench. These hypotheses, their effect upon groundwater migration, and their implications for the appearance of fluorescein in monitoring wells, were as follows:

- 1) The operation of the air sparge trench would have no effect upon groundwater migration. In this scenario, groundwater would continue to migrate to the northeast. Fluorescein would appear first in OP-2D, the OB-4D, then MP-5D.

- 2) The operation of the air sparge trench would result in churning of the water in the trench. In this case, groundwater would be mixed throughout the vertical and/or lateral extent of the trench. Fluorescein would appear nearly simultaneously in OP-2D and OP-2S. If lateral mixing also occurred, fluorescein would also eventually appear in OP-1D and/or OP-1S.
- 3) Long-term operation of the air sparge trench would create an "air dam," preventing groundwater from migrating along its normal course under static conditions. Instead, groundwater would migrate around the nearest end of the trench. In this case, fluorescein would appear in some combination of OB-2D, OB-2S, OB-3D and/or OB-3S. If groundwater were also backing up behind the "air dam," fluorescein would also appear in OB-1D and/or OB-1S.

From the results of this study, several conclusions can be drawn that prove that none of these hypothetical situations is occurring:

- 1) The operation of the air sparge trench at Camp Geiger has not created an "air dam" that forces groundwater to back up or migrate around the southeastern end of the trench.
- 2) Groundwater passing through the trench does not undergo vertical mixing.
- 3) No natural upward migration of groundwater is occurring.

The operation of the air sparge trench does not appear to influence the direction of groundwater migration. Therefore, for purposes of remediating the site, the air sparge trench could be extended laterally (southeast-northwest) to capture the entire plume of chlorinated hydrocarbons. However, at both ends of the trench an extension should be installed to the southwest for a distance of at least 100 feet. This increases the likelihood that any localized anomalous flows, such as those detected in this study, could be captured and treated.

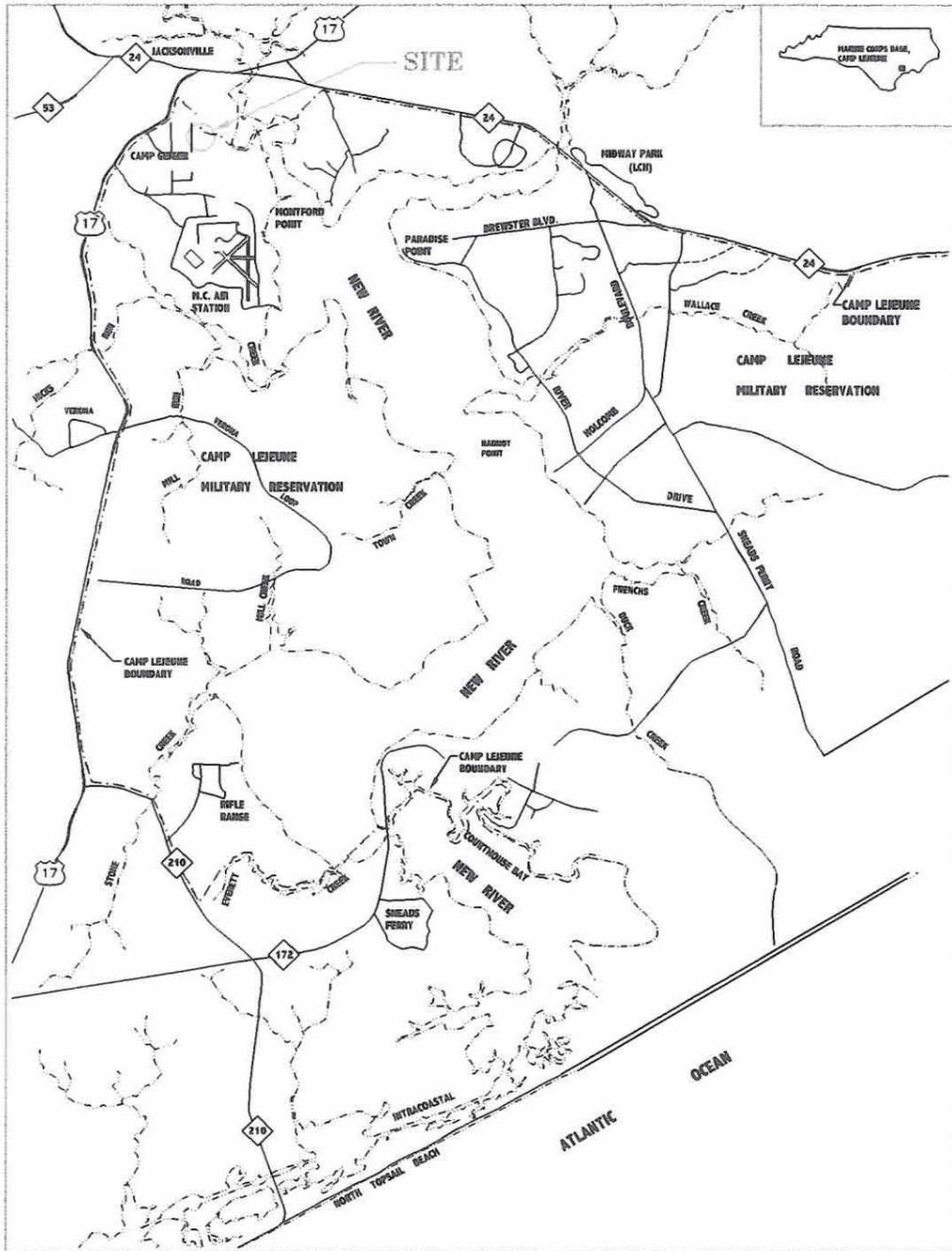
7 REFERENCE

Duley, J.W., 1986, "Water Tracing Using a Scanning Spectrofluorometer for the Detection of Fluorescent Dyes," Proceedings of the Environmental Problems in Karst Terrains and Their Solutions, pp. 389-405.

APPENDIX A

FIGURES

MARINE CORPS BASE, CAMP LEJEUNE NORTH CAROLINA



VICINITY MAP



**OHM Remediation
Services Corp.**
NORCROSS, GEORGIA
A SUBSIDIARY OF OHM CORPORATION

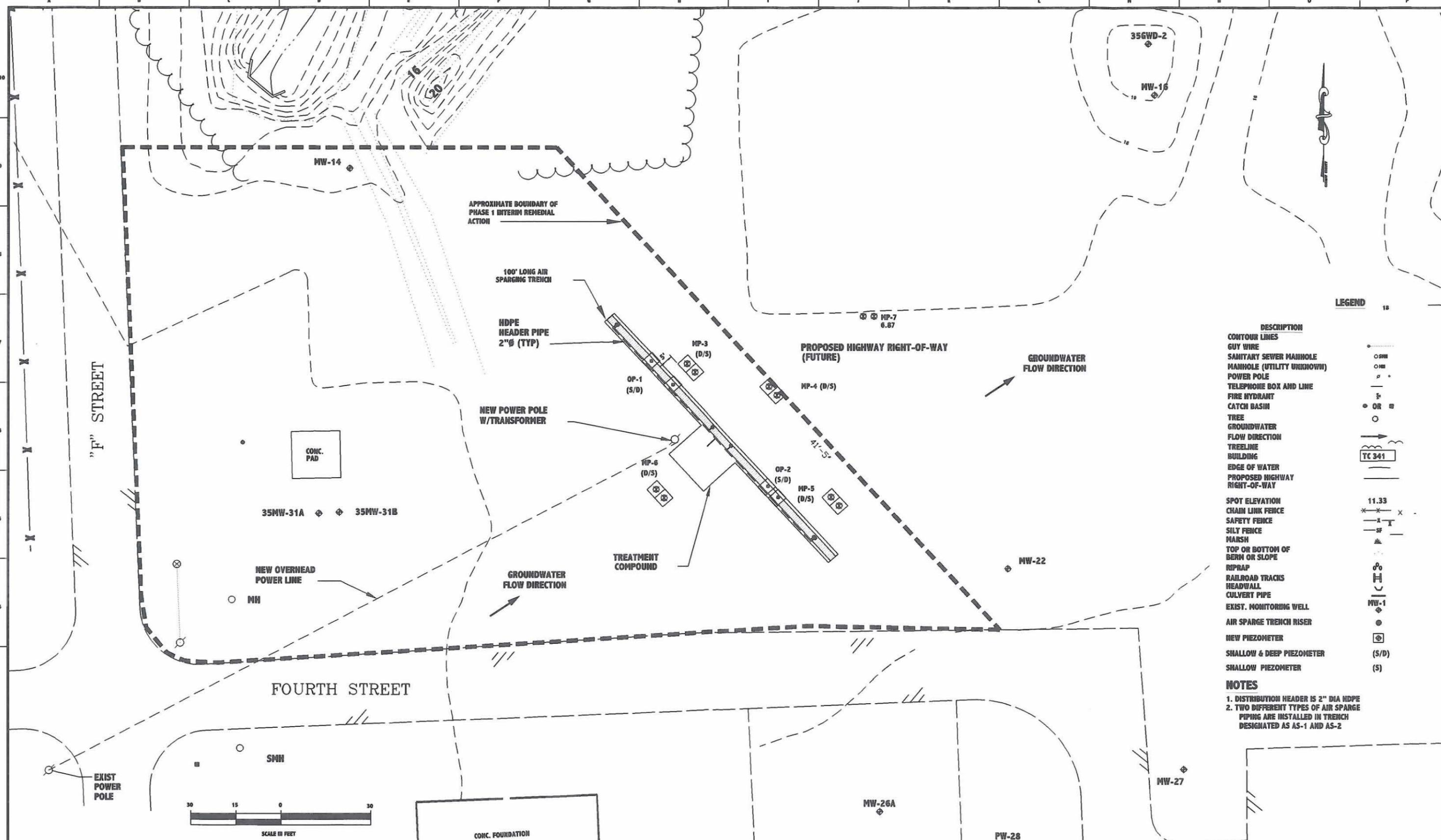
DRAWN BY	J. WILLIAMS	2/25/00
CHECKED BY	T. McCORRY	2/25/00
APPROVED BY	J. DUNN	2/25/00
REV. 0	SHEET # -	PROJECT NO. 917536

FIGURE 1

VICINITY MAP

**CAMP GEIGER
AIR SPARGE TRENCH
DYE TRACE TEST**

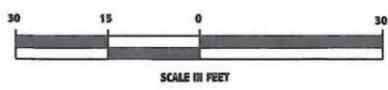
J:\LANTDIV\GEI\17536\dye_trace\917536-FIG-2.dwg Fri, 25/Feb/00 02:49pm jwilliams



LEGEND

DESCRIPTION	SYMBOL
CONTOUR LINES	(Dashed line)
GUY WIRE	(Circle with cross)
SANITARY SEWER MANHOLE	(Circle with 'S')
MANHOLE (UTILITY UNKNOWN)	(Circle with 'U')
POWER POLE	(Circle with 'P')
TELEPHONE BOX AND LINE	(Square with 'T')
FIRE HYDRANT	(Circle with 'F')
CATCH BASIN	(Circle with 'C')
TREE	(Circle with 'T')
GROUNDWATER FLOW DIRECTION	(Arrow)
TREELINE	(Wavy line)
BUILDING	(Rectangle)
EDGE OF WATER	(Dashed line with wavy edge)
PROPOSED HIGHWAY RIGHT-OF-WAY	(Dashed line)
SPOT ELEVATION	(Number)
CHAIN LINK FENCE	(X-X-X-X)
SAFETY FENCE	(T-T-T-T)
SILY FENCE	(S-S-S-S)
MARSH	(Wavy line)
TOP OR BOTTOM OF BERM OR SLOPE	(Line with hatching)
RIPRAP	(Stippled area)
RAILROAD TRACKS	(Line with cross-ticks)
HEADWALL	(Line with T-ticks)
CULVERT PIPE	(Line with U-ticks)
EXIST. MONITORING WELL	(Circle with 'MW-1')
AIR SPARGE TRENCH RISER	(Circle with 'A')
NEW PIEZOMETER	(Circle with 'P')
SHALLOW & DEEP PIEZOMETER	(Circle with 'S/D')
SHALLOW PIEZOMETER	(Circle with 'S')

NOTES
 1. DISTRIBUTION HEADER IS 2" DIA HDPE
 2. TWO DIFFERENT TYPES OF AIR SPARGE PIPING ARE INSTALLED IN TRENCH DESIGNATED AS AS-1 AND AS-2



OHM Remediation Services Corp.
 Norcross, Georgia
 A Subsidiary of OHM Corporation

PROJECT MANAGER: _____ DATE: _____
 SR. PROJECT ENGINEER: _____ DATE: _____
 SUPERVISOR: _____ DATE: _____

AT FULL SCALE (IF NOT 1"=SCALE INDICATED)

CADD FILE: _____
 DRAWN BY: J. WILLIAMS
 DESIGNED BY: T. MCNORY
 CHECKED BY: J. BURR

ZONE	REV.	DESCRIPTION	BY	DATE	APP.
	1	FINAL RAMP			
	2	AS BUILT			

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND

ATLANTIC DIVISION

NAVAL STATION NORFOLK, VIRGINIA
 CONTRACT N62470-93-D-3032 DELIVERY ORDER NO.0083
 OHM PROJECT No. 17536 MARINE CORPS BASE CAMP LEJEUNE, N.C.

FIGURE 2
 ORIGINAL SITE MAP
 CAMP GEIGER
 AIR SPARGE TRENCH
 DYE TRACE TEST

DRAWING NUMBER: _____
 SHEET NUMBER: _____ of _____
 DATE: 2/25/00

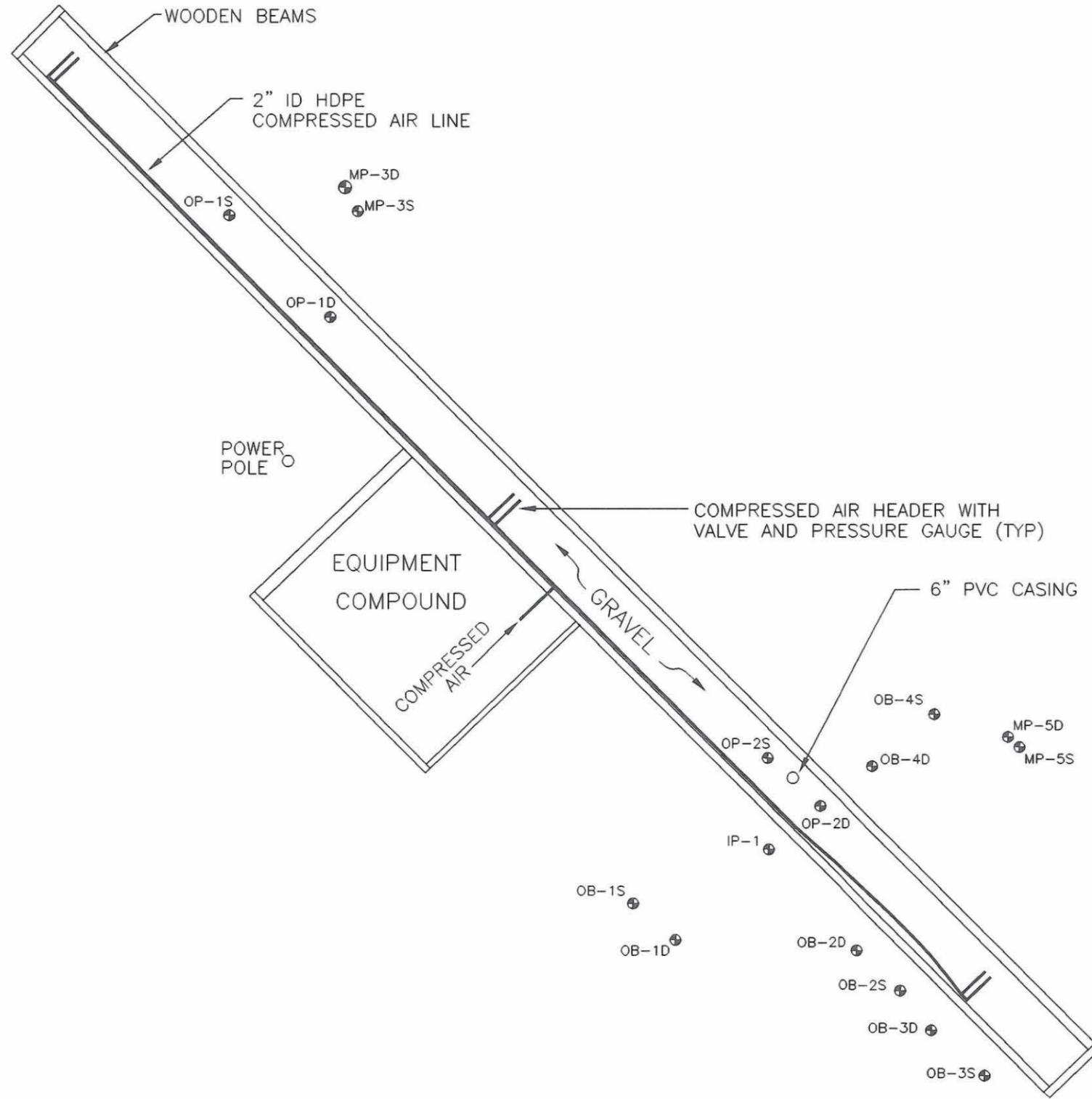


FIGURE 3

- OP-2D: OBSERVATION PIEZOMETER PERMANENTLY INSTALLED IN THE AIR SPARGE TRENCH
- MP-5D: OBSERVATION PIEZOMETER PERMANENTLY INSTALLED OUTSIDE THE AIR SPARGE TRENCH
- IP-1: TEMPORARY INJECTION WELL INSTALLED FOR DYE TRACE TEST
- OB-2D: TEMPORARY OBSERVATION WELL INSTALLED FOR DYE TRACE TEST



DEPARTMENT OF THE NAVY NAVAL STATION MCB CAMP LEJEUNE		NAVAL FACILITIES ENGINEERING COMMAND ATLANTIC DIVISION NORFOLK, VIRGINIA NORTH CAROLINA		OHM Remediation Services Corp. PROJECT NO. 917536		DESIGNED BY TAM J. WILLIAMS		CHECKED BY J. WILLIAMS		APPROVED BY DUNN		REV DATE BY CHK'D (APR)		DESCRIPTION/ISSUE REVISIONS	
CAMP LEJEUNE MCB CAMP GEIGER SITE 35 DYE TRACE TEST		DYE TRACE STUDY MAP													
SCALE: AS SHOWN		SIZE: B													
DELIVERY ORDER NO. 83		CONSTR. CONTRACT NO. N62470-93-D-3032													
NAVFAC DRAWING NO.		SHEET I.D.													

APPENDIX B

TABLES

TABLE 1
MCB CAMP LEJEUNE
CAMP GEIGER AIR SPARGE TRENCH
DYE TRACE STUDY
SCREENED INTERVALS OF DEEP WELLS

WELL ID	SCREENED INTERVAL
IP-1	36-41
OP-1D	28-33
OP-2D	29.5-34.5
OB-1D	35-40
OB-2D	35-40
OB-3D	34-39
OB-4D	34-39
MP-3D	40-45
MP-5D	40-45

TABLE 2
MCB CAMP LEJEUNE
CAMP GEIGER AIR SPARGE TRENCH
DYE TRACE STUDY
CONCENTRATIONS OF FLUORESCEIN DYE IN GROUNDWATER

TIME SINCE INJECTION	DATE	OP-2D	OP-2S	OB-1D	OB-1S	OB-2D	OB-2S	OB-3D	OB-3S	OB-4D	OB-4S	MP-5D	MP-5S	MP-3D	OP-1D	QC
0 HOUR	12/10/99	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.068	*	*	*		0.011
12 HOURS	12/10/99	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.034	*	*	*		0.011
1 DAY	12/11/99	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.058	*	*	*		0.011
2 DAYS	12/12/99	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.057	*	*	*		0.011
3 DAYS	12/13/99	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.046	*	*	*		0.011
4 DAYS	12/14/99	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.066	*	*	*		0.011
5 DAYS	12/15/99	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.052	*	*	*		0.011
6 DAYS	12/16/99	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.077	*	*	*		0.011
7 DAYS	12/17/99	0.035	nd	0.067	*	*	*		0.011							
8 DAYS	12/18/99	0.171	nd	**	0.091	*	*	*		0.011						
9 DAYS	12/19/99	1.683	nd	0.084	*	*	*		0.011							
10 DAYS	12/20/99	1.600	nd	0.096	*	*	*		0.011							
14 DAYS	12/24/99	6.933	nd	0.066	0.045	*	*	*		0.011						
20 DAYS	12/30/99	5.107	nd	1.388	nd	nd	*	*		0.011						
30 DAYS	01/09/00	6.341	nd	3.253	0.078	nd	0.051	*		0.010						
40 DAYS	01/19/00	1.762	nd	1.469	0.025	0.022	0.018	*		0.010						
50 DAYS	01/29/00	1.083	nd	0.622	0.104	0.074	0.027	50.0		0.010						
61 DAYS	02/09/00	*	*	*	*	*	*	*	*	*	*	*	*	*	0.083	0.010
63 DAYS	02/11/00	*	*	*	*	*	*	*	*	*	*	*	*	170.1	0.132	0.010

All concentrations are in parts per billion (ppb). Detections of fluorescein that are believed to be significant are indicated in **BOLD** type.
A groundwater sample was collected from the injection well (IP-1) on December 10, 199 prior to dye injection. It was non-detect for fluorescein.
nd = Nondetect. In the absence of any background concentrations of fluorescein, the detection limit is ten parts per trillion (0.010 ppb).
* = Not sampled.
** = Sample container was empty when it arrived at the laboratory.

APPENDIX C

PHOTOGRAPHS



Picture 1: A split spoon sampler showing the friable, light gray limestone that forms the matrix of the lower portion of the shallow aquifer



Picture 2: A view from the southeast showing the layout of the injection and monitoring wells. The surface of the air sparge trench is the three-foot wide strip of gravel, bounded by timbers, stretching away from the viewer to the northwest. The blue HDPE tubing running along the left side of the trench carries the compressed air from the air compressor (out of site in the background) to the vertical headers (seen with gauges in the foreground) that lead to the slotted pipe at the base of the trench. Two stick up casings can be observed in the trench. The nearer of the two is well OP-2D; the other is well OP-2S. The well directly in front of the white automobile is injection well IP-1. The two wells near the back of the car are OB-1S (closest to the car) and OB-1D. The four wells immediately left of the air sparge trench are, from furthest away to closest, OB-2D, OB-2S, OB-3D and OB-3S. OB-4D is the well on the right side of the trench that is closest to the trench. OB-4S is about five feet to the right of OB-4D.



Figure 4: The container of concentrated fluorescein dye solution. Immediately to the left of the container is injection well IP-1. Behind the container of dye is the gravel surface of the air sparge trench. The piezometer immediately behind the dye container in the air sparge trench is OP-1S; the piezometer to the right in the picture is OP-2D. The dedicated tubing installed in the piezometers for collecting samples can be seen. OB-4D is located just out of the picture to the right.



Picture 3: Concentrated fluorescein dye being introduced into injection well IP-1 with a peristaltic pump.



Picture 5: Typical sample vial used to collect groundwater samples and store them during shipment to the analytical laboratory.

APPENDIX D

COPIES OF ORIGINAL ANALYTICAL REPORTS

Crawford and Associates, Inc

* Groundwater Hydrologists, Geologists, Environmental Scientists
 * Laboratory Services

1136 US HWY 31-W Bypass
 Bowling Green, KY 42101
 (270) 745-9224
 E-mail: canda@dyetracing.com

LABORATORY REPORT SHEET

FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

IT/OHM CORPORATION

TINOPAL CBS-X	FLUORESCIEIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening Agent 351	Color Index: Acid Yellow 73	Color Index: Acid Red 87	Color Index: Acid Red 92	Color Index: Acid Red 388	Color Index: Acid Red 52
Dye Receptor: Activated Charcoal					
Analysis by: Spectrofluorophotometer					

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCIEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
1			QA-WATER					ND		ND				ND		ND	
2			QA-FLUORESCIEIN					+	0.011	ND				ND		ND	
3			QA-EOSINE					ND		+	0.008			ND		ND	
4			QA-RHODAMINE WT					ND		ND				+	0.011	ND	
5			QA-SULPHORHODAMINE B					ND		ND				ND		+	0.011
WL-001-0	01	11/22/99	OP-1-S					ND		ND				ND		ND	
WL-002-0	01	11/22/99	OP-1-D					ND		ND				ND		ND	
WL-003-0	01	11/22/99	MP-3-S					ND		ND				ND		ND	
WL-004-0	01	11/22/99	MP-3-D					ND		ND				ND		ND	
6			QA-WATER					ND		ND				ND		ND	
7			QA-FLUORESCIEIN					+	0.011	ND				ND		ND	
8			QA-EOSINE					ND		+	0.008			ND		ND	
9			QA-RHODAMINE WT					ND		ND				+	0.011	ND	
10			QA-SULPHORHODAMINE B					ND		ND				ND		+	0.011

Analyzed by: Will Clauson on 11/23/99

Comments: _____

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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 (270) 745-9224
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LABORATORY REPORT SHEET

FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

IT/OHM CORPORATION

TINOPAL CBS-X	FLUORESCIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening Agent 351	Color Index: Acid Yellow 73	Color Index: Acid Red 87	Color Index: Acid Red 92	Color Index: Acid Red 388	Color Index: Acid Red 52
Activated Charcoal	Dye Receptor: Activated Charcoal	Dye Receptor: Activated Charcoal	Dye Receptor: Activated Charcoal	Dye Receptor: Activated Charcoal	Dye Receptor: Activated Charcoal
Analysis by: Spectrofluorophotometer					

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	CHARCOAL AND WATER SAMPLES												
						TINOPAL CBS-X		FLUORESCIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B		
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	
1			QA-WATER															
2			QA-FLUORESCIN					+	0.011									
WL-001-0	02	12/10/1999 @ 08:34	IP-1					ND										
WL-002-0	02	12/10/1999 @ 08:48	OP-2D					ND										
WL-003-0	02	12/10/1999 @ 09:15	OB-4D					ND										
WL-004-0	02	12/10/1999 @ 10:30	OB-1D					ND										
WL-005-0	02	12/10/1999 @ 11:15	OB-2D					ND										
WL-006-0	02	12/10/1999 @ 12:17	OB-3D					ND										
WL-007-0	02	12/10/1999 @ 12:30	OP-2S					ND										
WL-008-0	02	12/10/1999 @ 12:36	OB-4S					B	0.058									
WL-009-0	02	12/10/1999 @ 12:42	OB-1S					ND										
WL-010-0	02	12/10/1999 @ 12:50	OB-2S					ND										
WL-011-0	02	12/10/1999 @ 12:54	OB-3S					ND										
WL-002-1	03	12/10/1999 @ 22:15	OP-2D					ND										

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	CHARCOAL AND WATER SAMPLES														
						TINOPAL CBS-X		FLUORESC EIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B				
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb			
WL-003-1	03	12/10/1999 @ 21:42	OB-4D					ND												
WL-004-1	03	12/10/1999 @ 21:44	OB-1D					ND												
WL-005-1	03	12/10/1999 @ 22:25	OB-2D					ND												
WL-006-1	03	12/10/1999 @ 22:20	OB-3D					ND												
WL-007-1	03	12/10/1999 @ 22:47	OP-2S					ND												
WL-008-1	03	12/10/1999 @ 22:30	OB-4S					B	0.034											
WL-009-1	03	12/10/1999 @ 23:04	OB-1S					ND												
WL-010-1	03	12/10/1999 @ 22:45	OB-2S					ND												
3			QA-WATER					ND												
4			QA-FLUORESC EIN					+	0.011											
WL-011-1	03	12/10/1999 @ 23:00	OB-3S					ND												
WL-002-2	04	12/11/1999 @ 09:59	OP-2D					ND												
WL-003-2	04	12/11/1999 @ 09:44	OB-4D					ND												
WL-004-2	04	12/11/1999 @ 09:51	OB-1D					ND												
WL-005-2	04	12/11/1999 @ 10:12	OB-2D					ND												
WL-006-2	04	12/11/1999 @ 10:26	OB-3D					ND												
WL-007-2	04	12/11/1999 @ 10:42	OP-2S					ND												
WL-008-2	04	12/11/1999 @ 10:53	OB-4S					B	0.058											
WL-009-2	04	12/11/1999 @ 10:37	OB-1S					ND												
WL-010-2	04	12/11/1999 @ 10:44	OB-2S					ND												
WL-011-2	04	12/11/1999 @ 11:03	OB-3S					ND												
6			QA-WATER					ND												
7			QA-FLUORESC EIN					+	0.011											

Analyzed by: Will Clauson on 12/13/99

ND Below Quantitation Limit
B Background
NS No Sample

+ Positive
++ Very Positive
+++ Extremely Positive

Created 3/2/00
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Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	CHARCOAL AND WATER SAMPLES											
						TINOPAL CBS-X		FLUORESCCEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb

Comments:

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

IT/OHM CORPORATION

TINOPAL CBS-X	FLUORESC EIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening Agent 351	Color Index: Acid Yellow 73	Color Index: Acid Red 87	Color Index: Acid Red 92	Color Index: Acid Red 388	Color Index: Acid Red 52
Dye Receptor: Activated Charcoal					
Analysis by: Spectrofluorophotometer					

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESC EIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
1			QA-WATER					ND									
2			QA-FLUORESC EIN					+	0.011								
WL-002-0	05	12/12/99	OP-2D					ND									
WL-003-0	05	12/12/99	OB-4D					ND									
WL-004-0	05	12/12/99	OB-1D					ND									
WL-005-0	05	12/12/99	OB-2D					ND									
WL-006-0	05	12/12/99	OB-3D					ND									
WL-007-0	05	12/12/99	OP-2S					ND									
WL-008-0	05	12/12/99	OB-4S					B	0.057								
WL-009-0	05	12/12/99	OB-1S					ND									
WL-010-0	05	12/12/99	OB-2S					ND									
WL-011-0	05	12/12/99	OB-3S					ND									
WL-002-1	06	12/13/99	OP-2D					ND									
WL-003-1	06	12/13/99	OB-4D					ND									
WL-004-1	06	12/13/99	OB-1D					ND									
WL-005-1	06	12/13/99	OB-2D					ND									
WL-006-1	06	12/13/99	OB-3D					ND									
WL-007-1	06	12/13/99	OP-2S					ND									
WL-008-1	06	12/13/99	OB-4S					B	0.046								
WL-009-1	06	12/13/99	OB-1S					ND									
WL-010-1	06	12/13/99	OB-2S					ND									
WL-011-1	06	12/13/99	OB-3S					ND									
3			QA-WATER					ND									
4			QA-FLUORESC EIN					+	0.011								

Analyzed by: Will Clauson on 12/14/99

Comments: _____

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

IT/OHM CORPORATION

TINOPAL CBS-X	FLUORESCIEIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening	Color Index:				
Agent 351	Acid Yellow 73	Acid Red 87	Acid Red 92	Acid Red 388	Acid Red 52
Dye Receptor:					
Activated Charcoal					
Analysis by:					
Spectrofluorophotometer	Spectrofluorophotometer	Spectrofluorophotometer	Spectrofluorophotometer	Spectrofluorophotometer	Spectrofluorophotometer

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCIEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
						1			QA-WATER				ND				
2			QA-FLUORESCIEIN				+	0.011									
WL-002-0	07	12/14/99	OP-2D				ND										
WL-003-0	07	12/14/99	OB-4D				ND										
WL-004-0	07	12/14/99	OB-1D				ND										
WL-005-0	07	12/14/99	OB-2D				ND										
WL-006-0	07	12/14/99	OB-3D				ND										
WL-007-0	07	12/14/99	OP-2S				ND										
WL-008-0	07	12/14/99	OB-4S				B	0.066									
WL-009-0	07	12/14/99	OB-1S				ND										
WL-010-0	07	12/14/99	OB-2S				ND										
WL-011-0	07	12/14/99	OB-3S				ND										
3			QA-WATER				ND										
4			QA-FLUORESCIEIN				+	0.011									

Analyzed by: Will Clauson on 12/15/99

Comments: _____

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

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TINOPAL CBS-X	FLUORESCCEIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening Agent 351	Color Index: Acid Yellow 73	Color Index: Acid Red 87	Color Index: Acid Red 92	Color Index: Acid Red 388	Color Index: Acid Red 52
Dye Receptor: Activated Charcoal					
Analysis by: Spectrofluorophotometer					

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCCEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
						1			QA-WATER				ND				
2			QA-FLUORESCCEIN				+	0.011									
WL-002-0	08	12/15/99	OP-2D				ND										
WL-003-0	08	12/15/99	OB-4D				ND										
WL-004-0	08	12/15/99	OB-1D				ND										
WL-005-0	08	12/15/99	OB-2D				ND										
WL-006-0	08	12/15/99	OB-3D				ND										
WL-007-0	08	12/15/99	OP-2S				ND										
WL-008-0	08	12/15/99	OB-4S				B	0.052									
WL-009-0	08	12/15/99	OB-1S				ND										
WL-010-0	08	12/15/99	OB-2S				ND										
WL-011-0	08	12/15/99	OB-3S				ND										
3			QA-WATER				ND										
4			QA-FLUORESCCEIN				+	0.011									

Analyzed by: Andrei Kerpan on 12/17/99

Comments: _____

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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LABORATORY REPORT SHEET

FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

IT/OHM CORPORATION

TINOPAL CBS-X	FLUORESC EIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening Agent 351	Color Index: Acid Yellow 73	Color Index: Acid Red 87	Color Index: Acid Red 92	Color Index: Acid Red 388	Color Index: Acid Red 52
Dye Receptor: Activated Charcoal					
Analysis by: Spectrofluorophotometer					

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESC EIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
						1			QA-WATER					ND			
2			QA-FLUORESC EIN					+	0.011								
WL-002-0	09	12/16/99	OP-2D					ND									
WL-003-0	09	12/16/99	OB-4D					ND									
WL-004-0	09	12/16/99	OB-1D					ND									
WL-005-0	09	12/16/99	OB-2D					ND									
WL-006-0	09	12/16/99	OB-3D					ND									
WL-007-0	09	12/16/99	OP-2S					ND									
WL-008-0	09	12/16/99	OB-4S					B	0.077								
WL-009-0	09	12/16/99	OB-1S					ND									
WL-010-0	09	12/16/99	OB-2S					ND									
WL-011-0	09	12/16/99	OB-3S					ND									
3			QA-WATER					ND									
4			QA-FLUORESC EIN					+	0.011								

Analyzed by: Andrei Kerpan on 12/17/99

Comments: _____

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

IT/OHM CORPORATION

TINOPAL CBS-X	FLUORESCIEIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening Agent 351	Color Index: Acid Yellow 73	Color Index: Acid Red 87	Color Index: Acid Red 92	Color Index: Acid Red 388	Color Index: Acid Red 52
Dye Receptor: Activated Charcoal					
Analysis by: Spectrofluorophotometer					

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCIEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
1			QA-WATER					ND									
2			QA-FLUORESCIEIN					+	0.011								
WL-002-0	10	12/17/99	OP-2D						0.035								
WL-003-0	10	12/17/99	OB-4D					ND									
WL-004-0	10	12/17/99	OB-1D					ND									
WL-005-0	10	12/17/99	OB-2D					ND									
WL-006-0	10	12/17/99	OB-3D					ND									
WL-007-0	10	12/17/99	OP-2S					ND									
WL-008-0	10	12/17/99	OB-4S					B	0.067								
WL-009-0	10	12/17/99	OB-1S					ND									
WL-010-0	10	12/17/99	OB-2S					ND									
WL-011-0	10	12/17/99	OB-3S					ND									
WL-002-0	11	12/18/99	OP-2D						0.171								
WL-003-0	11	12/18/99	OB-4D		NS												
WL-004-0	11	12/18/99	OB-1D					ND									
WL-005-0	11	12/18/99	OB-2D					ND									
WL-006-0	11	12/18/99	OB-3D					ND									
WL-007-0	11	12/18/99	OP-2S					ND									
WL-008-0	11	12/18/99	OB-4S					B	0.091								
WL-009-0	11	12/18/99	OB-1S					ND									
WL-010-0	11	12/18/99	OB-2S					ND									
WL-011-0	11	12/18/99	OB-3S					ND									
3			QA-WATER					ND									
4			QA-FLUORESCIEIN					+	0.011								

Analyzed by: Will Clauson on 12/20/99

Comments: NS-sample vial was received with no water in it.

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

Crawford and Associates, Inc

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LABORATORY REPORT SHEET

FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

IT/OHM CORPORATION

TINOPAL CBS-X	FLUORESCIEIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening Agent 351	Color Index: Acid Yellow 73	Color Index: Acid Red 87	Color Index: Acid Red 92	Color Index: Acid Red 388	Color Index: Acid Red 52
Dye Receptor: Activated Charcoal					
Analysis by: Spectrofluorophotometer					

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCIEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
						1			QA-WATER				ND				
2			QA-FLUORESCIEIN				+	0.011									
WL-002-0	12	12/19/99	OP-2D					1.683									
WL-003-0	12	12/19/99	OB-4D					ND									
WL-004-0	12	12/19/99	OB-1D					ND									
WL-005-0	12	12/19/99	OB-2D					ND									
WL-006-0	12	12/19/99	OB-3D					ND									
WL-007-0	12	12/19/99	OP-2S					ND									
WL-008-0	12	12/19/99	OB-4S					B	0.094								
WL-009-0	12	12/19/99	OB-1S					ND									
WL-010-0	12	12/19/99	OB-2S					ND									
WL-011-0	12	12/19/99	OB-3S					ND									
WL-002-0	13	12/20/99	OP-2D					1.600									
WL-003-0	13	12/20/99	OB-4D					ND									
WL-004-0	13	12/20/99	OB-1D					ND									
WL-005-0	13	12/20/99	OB-2D					ND									
WL-006-0	13	12/20/99	OB-3D					ND									
WL-007-0	13	12/20/99	OP-2S					ND									
WL-008-0	13	12/20/99	OB-4S					B	0.096								
WL-009-0	13	12/20/99	OB-1S					ND									
WL-010-0	13	12/20/99	OB-2S					ND									
WL-011-0	13	12/20/99	OB-3S					ND									
3			QA-WATER					ND									
4			QA-FLUORESCIEIN					+	0.011								

Analyzed by: Will Clauson on 12/21/99

Comments: _____

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

Crawford and Associates, Inc

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FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

IT/OHM CORPORATION

TINOPAL CBS-X	FLUORESCIEIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening Agent 351	Color Index: Acid Yellow 73	Color Index: Acid Red 87	Color Index: Acid Red 92	Color Index: Acid Red 388	Color Index: Acid Red 52
Dye Receptor: Activated Charcoal					
Analysis by: Spectrofluorophotometer					

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCIEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
						1			QA-WATER				ND				
2			QA-FLUORESCIEIN				+	0.011									
WL-002-0	14	12/24/99	OP-2D					6.933									
WL-003-0	14	12/24/99	OB-4D				B	0.066									
WL-004-0	14	12/24/99	OB-1D				ND										
WL-005-0	14	12/24/99	OB-2D				ND										
WL-006-0	14	12/24/99	OB-3D				ND										
WL-007-0	14	12/24/99	OP-2S				ND										
WL-008-0	14	12/24/99	OB-4S				B	0.045									
WL-009-0	14	12/24/99	OB-1S				ND										
WL-010-0	14	12/24/99	OB-2S				ND										
WL-011-0	14	12/24/99	OB-3S				ND										
3			QA-WATER				ND										
4			QA-FLUORESCIEIN				+	0.011									

Analyzed by: Will Clauson on 12/28/99

Comments: _____

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	CHARCOAL AND WATER SAMPLES											
						TINOPAL CBS-X		FLUORESCCEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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 (270) 745-9224
 E-mail: canda@dyetracing.com

LABORATORY REPORT SHEET

FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

IT/OHM CORPORATION

TINOPAL CBS-X	FLUORESCIEIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening Agent 351	Color Index: Acid Yellow 73	Color Index: Acid Red 87	Color Index: Acid Red 92	Color Index: Acid Red 388	Color Index: Acid Red 52
Dye Receptor: Activated Charcoal					
Analysis by: Spectrofluorophotometer					

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCIEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
1			QA-WATER					ND									
2			QA-FLUORESCIEIN					+	0.011								
WL-002-0	15	12/30/99	OP-2D						5.107								
WL-003-0	15	12/30/99	OB-4D						1.388								
WL-004-0	15	12/30/99	OB-1D					ND									
WL-005-0	15	12/30/99	OB-2D					ND									
WL-006-0	15	12/30/99	OB-3D					ND									
WL-007-0	15	12/30/99	OP-2S					ND									
WL-008-0	15	12/30/99	OB-4S					ND									
WL-009-0	15	12/30/99	OB-1S					ND									
WL-010-0	15	12/30/99	OB-2S					ND									
WL-011-0	15	12/30/99	OB-3S					ND									
WL-012-0	15	12/30/99	MP-5D					ND									
3			QA-WATER					ND									
4			QA-FLUORESCIEIN					+	0.011								

Analyzed by: Johnny Merideth on 1/3/00

Comments: _____

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

IT/OHM CORPORATION

TINOPAL CBS-X	FLUORESC EIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening	Color Index:				
Agent 351	Acid Yellow 73	Acid Red 87	Acid Red 92	Acid Red 388	Acid Red 52
Dye Receptor:					
Activated Charcoal					
Analysis by:					
Spectrofluorophotometer	Spectrofluorophotometer	Spectrofluorophotometer	Spectrofluorophotometer	Spectrofluorophotometer	Spectrofluorophotometer

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESC EIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
						1			QA-WATER					ND			
2			QA-FLUORESC EIN					+	0.010								
WH-002-0	16	1/9/00	OP-2D						6.341								
WL-003-0	16	1/9/00	OB-4D						3.253								
WL-004-0	16	1/9/00	OB-1D					ND									
WL-005-0	16	1/9/00	OB-2D					ND									
WL-006-0	16	1/9/00	OB-3D					ND									
WL-007-0	16	1/9/00	OP-2S					ND									
WL-008-0	16	1/9/00	OB-4S					B	0.078								
WL-009-0	16	1/9/00	OB-1S					ND									
WL-010-0	16	1/9/00	OB-2S					ND									
WL-011-0	16	1/9/00	OB-3S					ND									
WL-012-0	16	1/9/00	MP-5D					ND									
WL-013-0	16	1/9/00	MP-5S					B	0.051								
3			QA-WATER					ND									
4			QA-FLUORESC EIN					+	0.010								

Analyzed by: Johnny Merideth on 1/11/00

Comments: _____

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	CHARCOAL AND WATER SAMPLES											
						TINOPAL CBS-X		FLUORESCEN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

IT/OHM CORPORATION

TINOPAL CBS-X	FLUORESC EIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening Agent 351	Color Index: Acid Yellow 73	Color Index: Acid Red 87	Color Index: Acid Red 92	Color Index: Acid Red 388	Color Index: Acid Red 52
Dye Receptor: Activated Charcoal					
Analysis by: Spectrofluorophotometer					

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESC EIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
						1			QA-WATER				ND				
2			QA-FLUORESC EIN				+	0.010									
WH-002-0	17	1/19/00	OP-2D					1.762									
WL-003-0	17	1/19/00	OB-4D					1.469									
WL-004-0	17	1/19/00	OB-1D					ND									
WL-005-0	17	1/19/00	OB-2D					ND									
WL-006-0	17	1/19/00	OB-3D					ND									
WL-007-0	17	1/19/00	OP-2S					ND									
WL-008-0	17	1/19/00	OB-4S					B	0.025								
WL-009-0	17	1/19/00	OB-1S					ND									
WL-010-0	17	1/19/00	OB-2S					ND									
WL-011-0	17	1/19/00	OB-3S					ND									
WL-012-0	17	1/19/00	MP-5D					B	0.022								
WL-013-0	17	1/19/00	MP-5S					B	0.018								
3			QA-WATER					ND									
4			QA-FLUORESC EIN					+	0.010								

Analyzed by: Johnny Merideth on 1/20/00

Comments: _____

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

CHARCOAL AND WATER SAMPLES																	
Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCHEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

IT/OHM CORPORATION

TINOPAL CBS-X	FLUORESCEIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening Agent 351	Color Index: Acid Yellow 73	Color Index: Acid Red 87	Color Index: Acid Red 92	Color Index: Acid Red 388	Color Index: Acid Red 52
Dye Receptor: Activated Charcoal					
Analysis by: Spectrofluorophotometer					

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
1			QA-WATER					ND									
2			QA-FLUORESCEIN					+	0.010								
WH-002-0	18	1/29/00	OP-2D						1.083								
WH-003-0	18	1/29/00	OB-4D						0.622								
WL-004-0	18	1/29/00	OB-1D					ND									
WL-005-0	18	1/29/00	OB-2D					ND									
WL-006-0	18	1/29/00	OB-3D					ND									
WL-007-0	18	1/29/00	OP-2S					ND									
WL-008-0	18	1/29/00	OB-4S						0.104								
WL-009-0	18	1/29/00	OB-1S					ND									
WL-010-0	18	1/29/00	OB-2S					ND									
WL-011-0	18	1/29/00	OB-3S					ND									
WL-012-0	18	1/29/00	MP-5D					B	0.074								
WL-013-0	18	1/29/00	MP-5S					B	0.027								
WH-014-0	18	1/29/00	MP-3D						50.000								
3			QA-WATER					ND									
4			QA-FLUORESCEIN					+	0.010								

Analyzed by: Will Clauson on 2/1/00

Comments: _____

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

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TINOPAL CBS-X	FLUORESCIEIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening	Color Index:				
Agent 351	Acid Yellow 73	Acid Red 87	Acid Red 92	Acid Red 388	Acid Red 52
Dye Receptor:					
Activated Charcoal					
Analysis by:					
Spectrofluorophotometer	Spectrofluorophotometer	Spectrofluorophotometer	Spectrofluorophotometer	Spectrofluorophotometer	Spectrofluorophotometer

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCIEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
1			QA-WATER					ND									
2			QA-FLUORESCIEIN					+	0.010								
WL-015-0	19	2/9/00	OP-1D					B	0.083								
3			QA-WATER					ND									
4			QA-FLUORESCIEIN					+	0.010								

Analyzed by: Johnny Merideth on 2/10/00

Comments: _____

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

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TINOPAL CBS-X	FLUORESC EIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening Agent 351	Color Index: Acid Yellow 73	Color Index: Acid Red 87	Color Index: Acid Red 92	Color Index: Acid Red 388	Color Index: Acid Red 52
Dye Receptor: Activated Charcoal					
Analysis by: Spectrofluorophotometer					

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESC EIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
						1			QA-WATER				ND				
2			QA-FLUORESC EIN				+	0.010									
WL-014-0	20	2/11/00	MP-3D					170.100									
WL-015-0	20	2/11/00	OP-1D					0.132									
3			QA-WATER				ND										
4			QA-FLUORESC EIN				+	0.010									

Analyzed by: Johnny Merideth on 2/14/00

Comments: _____

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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FLUORIMETRIC ANALYSIS RESULTS

CAMP LEJEUNE

Analysis requested by:

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TINOPAL CBS-X	FLUORESCEIN	EOSINE	D&C Red #28	RHODAMINE WT	SULPHORHODAMINE B
Fabric Brightening Agent 351	Color Index: Acid Yellow 73	Color Index: Acid Red 87	Color Index: Acid Red 92	Color Index: Acid Red 388	Color Index: Acid Red 52
Dye Receptor: Activated Charcoal					
Analysis by: Spectrofluorophotometer					

CHARCOAL AND WATER SAMPLES

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
001-0	02	12/10/1999 @ 08:34	IP-1					ND									
014-0	18	1/29/00	MP-3D						50.000								
014-0	20	2/11/00	MP-3D						170.100								
004-0	01	11/22/99	MP-3-D					ND		ND				ND			ND
003-0	01	11/22/99	MP-3-S					ND		ND				ND			ND
012-0	15	12/30/99	MP-5D					ND									
012-0	16	1/9/00	MP-5D					ND									
012-0	17	1/19/00	MP-5D					B	0.022								
012-0	18	1/29/00	MP-5D					B	0.074								
013-0	16	1/9/00	MP-5S					B	0.051								
013-0	17	1/19/00	MP-5S					B	0.018								
013-0	18	1/29/00	MP-5S					B	0.027								
004-0	02	12/10/1999 @ 10:30	OB-1D					ND									
004-1	03	12/10/1999 @ 21:44	OB-1D					ND									
004-2	04	12/11/1999 @ 09:51	OB-1D					ND									

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	CHARCOAL AND WATER SAMPLES											
						TINOPAL CBS-X		FLUORESCCEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
004-0	05	12/12/99	OB-1D					ND									
004-1	06	12/13/99	OB-1D					ND									
004-0	07	12/14/99	OB-1D					ND									
004-0	08	12/15/99	OB-1D					ND									
004-0	09	12/16/99	OB-1D					ND									
004-0	10	12/17/99	OB-1D					ND									
004-0	11	12/18/99	OB-1D					ND									
004-0	12	12/19/99	OB-1D					ND									
004-0	13	12/20/99	OB-1D					ND									
004-0	14	12/24/99	OB-1D					ND									
004-0	15	12/30/99	OB-1D					ND									
004-0	16	1/9/00	OB-1D					ND									
004-0	17	1/19/00	OB-1D					ND									
004-0	18	1/29/00	OB-1D					ND									
009-0	02	12/10/1999 @ 12:42	OB-1S					ND									
009-1	03	12/10/1999 @ 23:04	OB-1S					ND									
009-2	04	12/11/1999 @ 10:37	OB-1S					ND									
009-0	05	12/12/99	OB-1S					ND									
009-1	06	12/13/99	OB-1S					ND									
009-0	07	12/14/99	OB-1S					ND									
009-0	08	12/15/99	OB-1S					ND									

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

Created 3/2/00
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CHARCOAL AND WATER SAMPLES																	
Code Number	Event	Date Collected	Feature Name	Peakft	Comment	TINOPAL CBS-X		FLUORESCEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
009-0	09	12/16/99	OB-1S					ND									
009-0	10	12/17/99	OB-1S					ND									
009-0	11	12/18/99	OB-1S					ND									
009-0	12	12/19/99	OB-1S					ND									
009-0	13	12/20/99	OB-1S					ND									
009-0	14	12/24/99	OB-1S					ND									
009-0	15	12/30/99	OB-1S					ND									
009-0	16	1/9/00	OB-1S					ND									
009-0	17	1/19/00	OB-1S					ND									
009-0	18	1/29/00	OB-1S					ND									
005-0	02	12/10/1999 @ 11:15	OB-2D					ND									
005-1	03	12/10/1999 @ 22:25	OB-2D					ND									
005-2	04	12/11/1999 @ 10:12	OB-2D					ND									
005-0	05	12/12/99	OB-2D					ND									
005-1	06	12/13/99	OB-2D					ND									
005-0	07	12/14/99	OB-2D					ND									
005-0	08	12/15/99	OB-2D					ND									
005-0	09	12/16/99	OB-2D					ND									
005-0	10	12/17/99	OB-2D					ND									
005-0	11	12/18/99	OB-2D					ND									
005-0	12	12/19/99	OB-2D					ND									
005-0	13	12/20/99	OB-2D					ND									
005-0	14	12/24/99	OB-2D					ND									
005-0	15	12/30/99	OB-2D					ND									
005-0	16	1/9/00	OB-2D					ND									
005-0	17	1/19/00	OB-2D					ND									
005-0	18	1/29/00	OB-2D					ND									
010-0	02	12/10/1999 @ 12:50	OB-2S					ND									
010-1	03	12/10/1999 @ 22:45	OB-2S					ND									
010-2	04	12/11/1999 @ 10:44	OB-2S					ND									

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

Created 3/2/00
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CHARCOAL AND WATER SAMPLES																	
Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCCEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
010-0	05	12/12/99	OB-2S					ND									
010-1	06	12/13/99	OB-2S					ND									
010-0	07	12/14/99	OB-2S					ND									
010-0	08	12/15/99	OB-2S					ND									
010-0	09	12/16/99	OB-2S					ND									
010-0	10	12/17/99	OB-2S					ND									
010-0	11	12/18/99	OB-2S					ND									
010-0	12	12/19/99	OB-2S					ND									
010-0	13	12/20/99	OB-2S					ND									
010-0	14	12/24/99	OB-2S					ND									
010-0	15	12/30/99	OB-2S					ND									
010-0	16	1/9/00	OB-2S					ND									
010-0	17	1/19/00	OB-2S					ND									
010-0	18	1/29/00	OB-2S					ND									
006-0	02	12/10/1999 @ 12:17	OB-3D					ND									
006-1	03	12/10/1999 @ 22:20	OB-3D					ND									
006-2	04	12/11/1999 @ 10:26	OB-3D					ND									
006-0	05	12/12/99	OB-3D					ND									
006-1	06	12/13/99	OB-3D					ND									
006-0	07	12/14/99	OB-3D					ND									
006-0	08	12/15/99	OB-3D					ND									

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

CHARCOAL AND WATER SAMPLES																	
Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESC EIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
006-0	09	12/16/99	OB-3D					ND									
006-0	10	12/17/99	OB-3D					ND									
006-0	11	12/18/99	OB-3D					ND									
006-0	12	12/19/99	OB-3D					ND									
006-0	13	12/20/99	OB-3D					ND									
006-0	14	12/24/99	OB-3D					ND									
006-0	15	12/30/99	OB-3D					ND									
006-0	16	1/9/00	OB-3D					ND									
006-0	17	1/19/00	OB-3D					ND									
006-0	18	1/29/00	OB-3D					ND									
011-0	02	12/10/1999 @ 12:54	OB-3S					ND									
011-1	03	12/10/1999 @ 23:00	OB-3S					ND									
011-2	04	12/11/1999 @ 11:03	OB-3S					ND									
011-0	05	12/12/99	OB-3S					ND									
011-1	06	12/13/99	OB-3S					ND									
011-0	07	12/14/99	OB-3S					ND									
011-0	08	12/15/99	OB-3S					ND									
011-0	09	12/16/99	OB-3S					ND									
011-0	10	12/17/99	OB-3S					ND									
011-0	11	12/18/99	OB-3S					ND									
011-0	12	12/19/99	OB-3S					ND									
011-0	13	12/20/99	OB-3S					ND									
011-0	14	12/24/99	OB-3S					ND									
011-0	15	12/30/99	OB-3S					ND									

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

CHARCOAL AND WATER SAMPLES																	
Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCIEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
011-0	16	1/9/00	OB-3S					ND									
011-0	17	1/19/00	OB-3S					ND									
011-0	18	1/29/00	OB-3S					ND									
003-0	02	12/10/1999 @ 09:15	OB-4D					ND									
003-1	03	12/10/1999 @ 21:42	OB-4D					ND									
003-2	04	12/11/1999 @ 09:44	OB-4D					ND									
003-0	05	12/12/99	OB-4D					ND									
003-1	06	12/13/99	OB-4D					ND									
003-0	07	12/14/99	OB-4D					ND									
003-0	08	12/15/99	OB-4D					ND									
003-0	09	12/16/99	OB-4D					ND									
003-0	10	12/17/99	OB-4D					ND									
003-0	11	12/18/99	OB-4D		NS												
003-0	12	12/19/99	OB-4D					ND									
003-0	13	12/20/99	OB-4D					ND									
003-0	14	12/24/99	OB-4D					B	0.066								
003-0	15	12/30/99	OB-4D					+	1.388								
003-0	16	1/9/00	OB-4D					+	3.253								
003-0	17	1/19/00	OB-4D					+	1.469								
003-0	18	1/29/00	OB-4D					+	0.622								
008-0	02	12/10/1999 @ 12:36	OB-4S					B	0.058								
008-1	03	12/10/1999 @ 22:30	OB-4S					B	0.034								
008-2	04	12/11/1999 @ 10:53	OB-4S					B	0.058								
008-0	05	12/12/99	OB-4S					B	0.057								
008-1	06	12/13/99	OB-4S					B	0.046								
008-0	07	12/14/99	OB-4S					B	0.066								
008-0	08	12/15/99	OB-4S					B	0.052								
008-0	09	12/16/99	OB-4S					B	0.077								
008-0	10	12/17/99	OB-4S					B	0.067								
008-0	11	12/18/99	OB-4S					B	0.091								
008-0	12	12/19/99	OB-4S					B	0.094								

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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CHARCOAL AND WATER SAMPLES																	
Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESC EIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
008-0	13	12/20/99	OB-4S					B	0.096								

ND Below Quantitation Limit
 B Background
 NS No Sample

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Created 3/2/00
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CHARCOAL AND WATER SAMPLES																	
Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
008-0	14	12/24/99	OB-4S					B	0.045								
008-0	15	12/30/99	OB-4S					ND									
008-0	16	1/9/00	OB-4S					B	0.078								
008-0	17	1/19/00	OB-4S					B	0.025								
008-0	18	1/29/00	OB-4S					B	0.104								
015-0	19	2/9/00	OP-1D					B	0.083								
015-0	20	2/11/00	OP-1D						0.132								
002-0	01	11/22/99	OP-1-D					ND		ND				ND			ND
001-0	01	11/22/99	OP-1-S					ND		ND				ND			ND
002-0	02	12/10/1999 @ 08:48	OP-2D					ND									
002-1	03	12/10/1999 @ 22:15	OP-2D					ND									
002-2	04	12/11/1999 @ 09:59	OP-2D					ND									
002-0	05	12/12/99	OP-2D					ND									
002-1	06	12/13/99	OP-2D					ND									
002-0	07	12/14/99	OP-2D					ND									
002-0	08	12/15/99	OP-2D					ND									
002-0	09	12/16/99	OP-2D					ND									
002-0	10	12/17/99	OP-2D					B	0.035								
002-0	11	12/18/99	OP-2D					+	0.171								
002-0	12	12/19/99	OP-2D					+	1.683								
002-0	13	12/20/99	OP-2D					+	1.600								
002-0	14	12/24/99	OP-2D					+	6.933								
002-0	15	12/30/99	OP-2D					+	5.107								
002-0	16	1/9/00	OP-2D					+	6.341								
002-0	17	1/19/00	OP-2D					+	1.762								
002-0	18	1/29/00	OP-2D					+	1.083								
007-0	02	12/10/1999 @ 12:30	OP-2S					ND									
007-1	03	12/10/1999 @ 22:47	OP-2S					ND									
007-2	04	12/11/1999 @ 10:42	OP-2S					ND									
007-0	05	12/12/99	OP-2S					ND									
007-1	06	12/13/99	OP-2S					ND									

ND Below Quantitation Limit
 B Background
 NS No Sample

+ Positive
 ++ Very Positive
 +++ Extremely Positive

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CHARCOAL AND WATER SAMPLES																	
Code Number	Event	Date Collected	Feature Name	Peakfit	Comment	TINOPAL CBS-X		FLUORESCEIN		EOSINE		D&C RED #28		RHODAMINE WT		SULPHORHODAMINE B	
						Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb	Results	Conc in ppb
007-0	07	12/14/99	OP-2S					ND									
007-0	08	12/15/99	OP-2S					ND									
007-0	09	12/16/99	OP-2S					ND									
007-0	10	12/17/99	OP-2S					ND									
007-0	11	12/18/99	OP-2S					ND									
007-0	12	12/19/99	OP-2S					ND									
007-0	13	12/20/99	OP-2S					ND									
007-0	14	12/24/99	OP-2S					ND									
007-0	15	12/30/99	OP-2S					ND									
007-0	16	1/9/00	OP-2S					ND									
007-0	17	1/19/00	OP-2S					ND									
007-0	18	1/29/00	OP-2S					ND									

Analyzed by: _____ on _____

Comments: _____

ND Below Quantitation Limit
 B Background
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