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DRAFT ENGINEERING EVALUATION AVIATION FUEL DISTRIBUTION SYSTEM INTEGRITY TESTING REPORT MCAS CHERRY POINT NC

12/13/1996

DAMES AND MOORE

DRAFT REPORT

ENGINEERING EVALUATION AVIATION FUEL DISTRIBUTION SYSTEM INTEGRITY TESTING MARINE CORPS AIR STATION CHERRY POINT, NORTH CAROLINA

PREPARED FOR:

Atlantic Division
Naval Facilities Engineering Command

Contract No. N62470-93-D-4034
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December 13, 1996

PREPARED BY:

DAMES & MOORE
A DAMES & MOORE GROUP COMPANY

DRAFT REPORT
ENGINEERING EVALUATION
AVIATION FUEL DISTRIBUTION
SYSTEM INTEGRITY TESTING
MARINE CORPS AIR STATION CHERRY POINT, NC

Prepared For

Department of the Navy - Atlantic Division
Naval Facilities Engineering Command

DAMES & MOORE

2807 N. Parham Road, Suite 114, Richmond, Virginia 23294

December 13, 1996

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consists of one 18-inch supply and one 6-inch return aluminum pipe for transferring fuel from Tank Farm A to the fuel stations located on the flightline. The pipelines throughout the distribution system are buried to an approximate average depth of 5 feet.

2.0 FIELD INVESTIGATION

Dames & Moore retained Tracer Research Corporation (Tracer) to perform integrity testing and a soil gas survey on 25,000 feet of aviation fuel distribution piping at MCAS Cherry Point, North Carolina. The selected method for the integrity testing was the Tracer Tight^{R} Leak Test which is described in the attached report prepared by Tracer (Attachment A). Dames & Moore personnel provided oversight of Tracer's activities during the tightness testing, evaluated the results provided by Tracer and developed conclusions and recommendations as provided in this report. The following section summarizes the field investigation activities.

As required by the Tracer Tight^{R} Leak Test, all piping to be tested was inoculated by Tracer personnel. The Tracer Tight^{R} Leak Test procedures are further described in the report provided in Attachment B.

A total of 1,173 permanent probes were initially installed along the pipelines in 1993. In 1995 approximately 140 new probes were installed during completion of the integrity testing program by Dames & Moore to replace probes that were found to be damaged or inaccessible (paved over/concreted in, etc.). In 1996 approximately 30 new probes were installed to replace missing probes.

The specific details of the methodology employed during testing and the locations of the new probes installed are provided in Attachment A.

2.1 RAIL CAR PIPELINE

Permanent probes were installed along the length of the underground piping from the 19 rail car offloading stations at the rail car facility to the aboveground distribution piping connection at Tank Farm B. The Rail Car Pipeline probes are numbered 0001 through 0097. All probes locations are shown in Figure 1. Piping from the 19 stations is connected to five pipelines; these pipelines connect to the three transfer pumps within the pump house. The transfer pumps allow for discharge into two pipelines which cross under Roosevelt Boulevard, and traverse into a valve pit at Tank Farm B. At the valve pit, the two pipelines discharge into one pipeline which is then routed underground to connect with the aboveground distribution piping for the tank farm.

Permanent probes were not installed along Roosevelt Boulevard. Fuel-supply piping under this road is sleeved through underground culverts such that any leak in this section would be detected by the permanent probes installed at either end of the culvert.

2.2 SOUTHERN PIPELINE

Permanent probes were installed along the pipeline extending from the aboveground Northern and Southern Pipeline connection within Tank Farm B to the underground Northern and Southern Pipeline connection within Tank Farm A. The Southern Pipeline probes are numbered 111 through 336. These probe locations are shown in Figures 2 through 4. The Southern Pipeline is routed underground after the Northern and Southern Pipeline aboveground connection and exits Tank Farm B, where it continues underground generally parallel to 6th Avenue up to the entrance to Tank Farm A. At the entrance to Tank Farm A, the Southern Pipeline runs perpendicular to 6th Avenue and then connects to the Northern Pipeline in an underground vault.

2.3 NORTHERN PIPELINE

Permanent probes were installed along the length of the underground pipeline extending from the Northern and Southern Pipeline aboveground connection within Tank Farm B to the aboveground connection at the transfer pump pad at Tank Farm A. The Northern Pipeline probes are numbered 337 through 538, and 98 through 110. These probe locations are shown in Figures 2 through 4. Fuel is pumped from one or more tanks at Tank Farm B, through the aboveground distribution piping to the Northern and Southern Pipeline "T" aboveground connection. Fuel is transferred into the Northern Pipeline. This pipeline extends from Tank Farm B, runs along 7th Avenue for several thousand feet before turning in the form of doglegs (See Figure 2). Thereafter, the Northern Pipeline follows a generally parallel path to 6th Avenue until it emerges aboveground at the transfer pump pad within Tank Farm A.

2.4 FLIGHTLINE PIPELINE

Permanent probes were installed along the underground piping that extends from the transfer pump pad at Tank Farm A to two separate aboveground recirculation pads located at each end of the flightline. The flightline probes are numbered TFA-1 through TFA-5 and 539 through 1160. These probe locations are shown in Figures 4 through 10. The supply and return pipelines go underground at the transfer pump pad within Tank Farm A and run west out to the flightline.

In the grassy area which separates the inbound taxiway and the apron, the pipelines enter a vault and end at a "T" connection. One branch is routed north to the deep cargo refueling pits (Pits 9 through 15), where the piping emerges aboveground at a recirculation pad. The other branch is routed south up to fueling Pit 1; it then crosses south-eastward across the tower ramp, and continues eastward to the fighter aircraft refueling lanes 6 through 9, where the piping emerges aboveground at a second recirculation pad.

The piping which runs south-eastward across the tower ramp may be encased in concrete. Alternatively, the piping lies beneath an older concrete tower ramp. Several probes along this area were installed only to depths of 3 feet due to an unknown obstruction (presumably concrete) encountered at 3 feet below grade which did not allow probes to be installed using the hydraulic press or hydraulic hammer to be pushed deeper.

3.0 RESULTS

3.1 TEST METHODOLOGY

The Tracer Tight Methodology used to test the integrity of the Cherry Point Aviation Fuel Distribution System follows an Environmental Protection Agency's Standard Evaluation Procedure. This test method was third party certified to follow the EPA Standard Test Procedure for Evaluation of Leak Detection Methods; Pipeline Leak Detection Methods. The test method used to determine the TVHC concentrations of the soil gas samples was EPA SW 846 Method 8010/8020 modified for gas chromatography.

3.2 RAIL CAR PIPELINE

Probe locations along the Rail Car Pipeline are shown in Figures 1 and 2. Probe numbers 0001 through 0097 were located along this pipeline. Tracer "R" was not detected in any of the samples collected along the Rail Car Pipeline. Based on these results, Tracer certifies that the Rail Car Pipeline is tight in accordance with EPA criteria.

TVHC concentrations in soil gas samples collected along the Rail Car Pipeline ranged from below detection to 7.3 mg/L. The detected concentrations may be attributed to historical spills or spillage associated with fuel unloading operations. No samples exhibited TVHC concentrations above 10 mg/L.

3.3 SOUTHERN PIPELINE

Probe locations along the Southern Pipeline are shown in Figures 2 through 4. Probe numbers 111 through 336 were used. Tracer "R" was not detected in any of the samples collected along the Southern Pipeline. Based on these results, Tracer certifies that the Southern Pipeline is tight in accordance with EPA criteria.

TVHC concentrations in soil gas samples ranged from below detection to 9.1 mg/L. The majority of samples (0111-0291) exhibited no detectable concentrations of TVHC. No samples exhibited TVHC concentrations above 10.0 mg/L. Samples from probes 0306-0314 showed high TVHC concentrations adjacent to 6th Avenue. Probes 0330-0336 are located adjacent to Tank Farm A, where a historical underground fuel plume was previously documented (GP, 1993).

3.4 NORTHERN PIPELINE

Probe locations along the Northern Pipeline are shown in Figures 2 through 4. Probe number 0098 through 110 and 337 through 554 were located adjacent to the Northern Pipeline. Tracer "R" was not detected in any of the samples collected from these probes. Based on these results, Tracer certifies the Northern Pipeline to be tight in accordance with EPA criteria.

TVHC concentrations in soil gas samples collected from probes located along the Northern Pipeline ranged from below detection to 13.0 mg/L. Samples from 4 probes exhibited TVHC concentrations above 10.0 mg/L. The four samples with TVHC concentrations above 10.0 mg/L are located in the following areas:

- (Probe 0357) Parking Area at Building 4048;
- (Probes 0529, 0531, and 0533) truck top off stand in Tank Farm A.

These concentrations may be attributed to historical leaks and spills from other sources such as wash racks, vehicles, abandoned and underground fuel pipelines, and fuel truck loading operations. Samples containing high TVHC concentrations were predominantly obtained from probes located within and around Tank Farm A, where a historical underground fuel plume was previously documented (GP, 1993).

3.5 FLIGHTLINE PIPELINE

Probe locations along the Flightline Pipeline are shown on Figures 4 through 9. Probe numbers 0555 through 1160 and TFA-1 through TFA-5 were located adjacent to the Flightline Pipeline. Two samples containing Tracer "R" at concentrations above the detection limit were identified. Probes 0619 and 0621 are located at the "T" connection in the pipeline at Taxiway 3 (Figure 5). Samples from these two probes exhibited corresponding high TVHC concentrations. Probes 0832-0834 and 0620 were not sampled as Cherry Point personnel destroyed the probes during an excavation of the Flightline Pipeline performed during the Tracer Testing field effort. Based on these results, the Flightline Pipeline failed Tracer criteria for integrity testing.

On October 25, 1996, Cherry Point personnel began excavating a portion of the Flightline piping that was suspected of leaking. Groundwater monitoring wells in the area near the "T" connection were found to contain free product. Cherry Point personnel excavated down to the

product piping between the High Point Valve (HPV) and Low Point Drain (LPD) at probe locations 0620 and 0832. These probes as well as 0833 and 0834 were destroyed and were not sampled. During the excavation of the piping associated with sampling probes 0620 and 0832, a welded joint in the pipeline was observed to be leaking product into the surrounding environment. At the time of Dames & Moore's demobilization from the site the excavation remained open and the leaking pipe had not yet been repaired.

TVHC concentrations in soil gas samples collected from probes along the Flightline Pipeline ranged from below detection to 17.0 mg/L. Samples from 2 probes were reported to have TVHC concentrations above 10.0 mg/L. These concentrations may be attributed to historical leaks and spills from other sources such as tanks and abandoned underground fuel pipelines and spills associated with refueling activities.

TVHC concentrations above 10 mg/L were reported for samples collected from one probe in Heavy pit 10 (0719) and one probe near the High Point Drain in Fuel Pit 1.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

Dames & Moore and Tracer Research Corporation performed integrity testing of the Aviation Fuel Distribution System at MCAS Cherry Point, North Carolina. Based on the integrity test results, Dames & Moore presents the following conclusions:

- The Rail Car, Southern and Northern Pipelines pass the Tracer integrity testing and are certified by Tracer to be tight in accordance with EPA criteria. The Flightline Pipeline failed the precision leak test in one location. The criterion for failure is a detected Tracer compound concentration of 0.1 ug/L or higher.
- Only two of the 1,173 probes sampled failed the tracer test. Probes 0619 and 0621 (Figure 5) yielded samples with detectable concentration of Tracer "R". Twenty feet of piping was exposed by MCAS Cherry Point and inspected for leakage. The piping was found to have an approximately five inch long failure of a welded joint, and the surrounding soil was found to be heavily saturated with free product. Based on Tracer's methodology and third party certification, Tracer certifies the remainder of the pipeline to be tight or with a leak rate of less than 0.1 gallons per hour.
- Two additional probe locations (0833 and 0834) near the Flightline excavation were not tested and thus the integrity of the piping in these locations is not known.
- When TVHC was detected in soil gas samples collected from the probes, this indicates historical impacts to the soil from petroleum products. TVHC concentrations greater than 10 mg/L indicates free product in the soils.

4.2 RECOMMENDATIONS

Dames & Moore presents the following recommendations:

- Areas where high TVHC concentrations were reported for soil gas samples collected should be considered during construction activities or remedial activities.

- The failed welded seam in the Flightline Piping at probe locations 0620 and 0832 should be repaired before the hydrant system is put back into full operational service.
- Groundwater and soil in the area of the identified leak should be remediated.

ATTACHMENT A

TRACER RESEARCH REPORT

Tracer Tight Testing
of
24,525 Feet of Pipeline
at
Marine Corps Air Station
Cherry Point, North Carolina

Tracer Tight® Integrity Testing

Marine Corps Air Station
Cherry Point, North Carolina

November 1996

Prepared for:

Department of the Navy

and

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20065-000.P

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APPENDICES

1.0 INTRODUCTION

Dames and Moore and Tracer Research Corporation (Tracer Research) performed a *Tracer Tight*® leak test on 24,525 feet of pipeline. All testing was conducted between October 1, 1996 and November 7, 1996 at the Marine Corps Air Station, Cherry Point, North Carolina.

The inoculation of three Above Ground Storage Tanks (ASTs) and two Giant Underground Storage Tanks (GUSTs) with tracer compound took place on October 1 by Tracer Research personnel to a concentration not to exceed 5 parts per million (ppm). All inoculation was performed using Tracer R. The GUSTs and railroad cars feed JP-5 fuel through four sections of pipeline within the Aviation Fuel Distribution System (AFDS). The following four sections were *Tracer Tight* tested.

Railcar Leg

All underground piping from the railcar off-loading dock to the above ground point within Tank Farm B.

Northern Leg

All underground 10-inch steel piping between Tank Farms A and B.

Southern Leg

All underground 10-inch aluminum piping between Tank Farm A and B.

Flightline Leg

All underground piping from Tank Farm A to and within the fueling lanes and pits.

The Leak Detection Monitoring System (LDMS) was installed at a previous date by Tracer Research. Samples were collected from October 23, 1996 to November 7, 1996 and were analyzed on-site by Tracer Research personnel using a laboratory grade gas chromatograph.

2.0 CONCEPT OF OPERATION

The *Tracer Tight* leak detection method relies upon the addition of a highly volatile liquid or gaseous chemical, a tracer, into the system to be tested. If a leak should occur in the underground fueling system, the tracer will escape from the fuel by vaporization and disperse throughout the soil by molecular diffusion. Testing was performed by sampling permanent probes installed in the soil around the piping. Each sampling probe has an effective detection radius of approximately ten to twelve feet. This means that a given probe can detect an unauthorized release anywhere within the prescribed ten to twelve foot radius surrounding the probe. For this method to be effective, the tracer must be introduced into the fuel system at least one week prior to sampling to allow for adequate diffusion into the soil gas surrounding the system. This process of leak detection by adding a liquid or gas tracer into a liquid product followed by detection of any released tracer underground into the vapor phase is protected under Tracer Research Corporation patents.

3.0 CRITERIA FOR DETERMINATION OF LEAKAGE

Determination of leakage is based on the criteria established in the *Tracer Tight* third party evaluation, which meets the criteria set forth in NFPA 329 for a precision leak test. According to EPA standard test procedures for evaluating leak detection methods, this method is capable of detecting leaks of 0.05 gallons per hour with a Probability of Detection (PD) of 0.97 and a Probability of False Alarm (PFA) of 0.029.

PASS: No Tracer Detected

FAIL: Tracer Detected

4.0 SUMMARY OF FINDINGS

The analytical results of this *Tracer Tight* leak test are condensed in Appendix B. The data are presented by sampling location and analyte concentration. When a compound was not detected, the detection limit is presented as 0.0000 milligrams per liter (mg/L). The collected samples were analyzed for Tracer R and total volatile hydrocarbons (TVHC).

A failing concentration of Tracer R was detected along the flightline leg. Tracer R was detected in probe sample 0619 which is located near Fueling Pit 4 where the pipeline tees off to the Heavy Pits and Hot Pits. High concentrations of hydrocarbons were also present at this location. A leak in the pipeline was discovered near the Low Point Drain by base personnel before a *Tracer Tight* test was conducted at this location.

A large open pit was immediately created by base personnel in the attempt to find the leak, thereby uncovering the pipeline and destroying leak detection probes. Therefore, a *Tracer Tight* test was not conducted on the portions of the pipeline between probes 0619 and 0621 and 0619 to 0836. It is possible that the failing level of Tracer R is a result of the single leak being investigated at the Low Point Drain. However, due to the excavation of soil at the Low Point Drain it was impossible to determine if this failing level was the result of the leak at the Low Point Drain.

Consequently, the piping located in the flightline section receives a failing *Tracer Tight* test result. The railcar, southern and northern sections receive passing *Tracer Tight* test results.

APPENDIX A: Certification

TRACER TIGHT LEAK DETECTION CERTIFICATION

Marine Corps Air Station
Cherry Point, North Carolina
Piping

Date: November 1996

Job No: 20065-000.P

SECTION	SIZE(gal)	PRODUCT	TRACER	STATUS
Railcar	2,300	JP-5	R	Pass
Southern	2,712	JP-5	R	Pass
Northern	2,900	JP-5	R	Pass
Flightline	16,613	JP-5	R	Fail

Tracer Research Corporation certifies that the piping listed in the above table have been tested by means of *Tracer Tight*, which meets the criteria set forth in NFPA 329 for a precision leak test. According to EPA standard test procedures for evaluating leak detection methods, this method is capable of detecting leaks of 0.05 gallons per hour with a Probability of Detection (PD) of 0.97 and Probability of False Alarm (PFA) of 0.029.

Submitted by: Tracer Research Corporation

The following criteria is used for the classification of leakage.

PASS CRITERIA:

TRACER **NOT DETECTED**

FAIL CRITERIA:

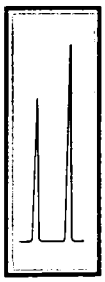
TRACER **DETECTED**

APPENDIX B: Data

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

Tracer Research Corporation



SAMPLE	TRACER R mg/L	TVHC mg/L
RAILCAR LEG		
LD-1-2.5'	0.0000	0.0000
LD-2-2.5'	0.0000	0.4200
LD-3-2.5'	0.0000	0.0690
LD-4-2.5'	0.0000	0.0000
LD-5-2.5'	0.0000	1.0000
LD-6-2.5'	0.0000	0.0000
LD-7-2.5'	0.0000	0.0000
LD-8-2.5'	0.0000	0.1200
LD-9-2.5'	0.0000	1.9000
LD-10-2.5'	0.0000	0.0000
LD-11-2.5'	0.0000	1.9000
LD-12-2.5'	0.0000	0.0000
LD-13-2.5'	0.0000	0.0000
LD-14-2.5'	0.0000	1.6000
LD-15-2.5'	0.0000	0.0720
LD-16-2.5'	0.0000	0.0000
LD-17-2.5'	0.0000	0.0000
LD-18-2.5'	0.0000	0.0000
LD-19-2.5'	0.0000	0.0000
LD-20-2.5'	0.0000	0.0000
LD-21-2.5'	0.0000	0.0000
LD-22-2.5'	0.0000	0.0000
LD-23-2.5'	0.0000	0.0000
LD-24-2.5'	0.0000	0.0000
LD-25-2.5'	0.0000	0.0000
LD-26-2.5'	0.0000	0.0000
LD-27-2.5'	0.0000	1.5000
LD-28-2.5'	0.0000	0.0000
LD-29-2.5'	0.0000	0.0000
LD-30-2.5'	0.0000	0.0000
LD-31-2.5'	0.0000	1.1000
LD-32-2.5'	0.0000	0.0000
LD-33-2.5'	0.0000	0.0000
LD-34-2.5'	0.0000	0.0930
LD-35-2.5'	0.0000	7.3000
LD-36-2.5'	0.0000	0.0000
LD-37-2.5'	0.0000	0.0000
LD-38-2.5'	0.0000	1.4000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
RAILCAR LEG		
LD-39-2.5'	0.0000	0.0000
LD-40-2.5'	0.0000	0.0000
LD-41-2.5'	0.0000	0.0000
LD-42-2.5'	0.0000	3.5000
LD-43-2.5'	0.0000	0.0000
LD-44-2.5'	0.0000	4.1000
LD-45-2.5'	0.0000	0.0000
LD-46-2.5'	0.0000	0.0000
LD-47-2.5'	0.0000	0.0000
LD-48-2.5'	0.0000	0.0000
LD-49-2.5'	0.0000	0.0000
LD-50-2.5'	0.0000	0.0000
LD-51-2.5'	0.0000	0.0000
LD-52-2.5'	0.0000	0.0000
LD-53-2.5'	0.0000	0.0000
LD-54-2.5'	0.0000	0.0000
LD-55-2.5'	0.0000	0.0000
LD-56-2.5'	0.0000	0.0000
LD-57-2.5'	0.0000	0.0000
LD-58-2.5'	0.0000	0.0000
LD-59-2.5'	0.0000	0.0000
LD-60-2.5'	0.0000	0.0000
LD-61-2.5'	0.0000	0.0000
LD-62-2.5'	0.0000	0.0000
LD-63-2.5'	0.0000	0.0000
LD-64-2.5'	0.0000	0.0000
LD-65-2.5'	0.0000	0.0000
LD-66-2.5'	0.0000	0.0000
LD-67-2.5'	0.0000	0.0000
LD-70-2.5'	0.0000	0.0000
LD-71-2.5'	0.0000	0.0000
LD-72-2.5'	0.0000	0.0000
LD-73-2.5'	0.0000	0.0000
LD-74-2.5'	0.0000	0.0000
LD-75-2.5'	0.0000	1.6000
LD-76-2.5'	0.0000	0.0000
LD-77-2.5'	0.0000	0.8400
LD-78-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
RAILCAR LEG		
LD-79-2.5'	0.0000	0.0000
LD-80-2.5'	0.0000	0.0000
LD-81-2.5'	0.0000	0.0000
LD-82-2.5'	0.0000	0.6600
LD-83-2.5'	0.0000	0.0000
LD-84-2.5'	0.0000	0.0000
LD-85-2.5'	0.0000	0.0000
LD-86-2.5'	0.0000	0.0000
LD-87-2.5'	0.0000	0.0000
LD-88-2.5'	0.0000	0.0000
LD-89-2.5'	0.0000	0.0000
LD-90-2.5'	0.0000	3.8000
LD-91-2.5'	0.0000	0.0000
LD-92-2.5'	0.0000	0.0000
LD-93-2.5'	0.0000	0.0000
LD-94-2.5'	0.0000	0.0000
LD-95-2.5'	0.0000	0.0000
LD-96-2.5'	0.0000	0.0000
LD-97-2.5'	0.0000	0.0000

SAMPLE	TRACER R mg/L	TVHC mg/L
SOUTHERN LEG		
LD-111-2.5'	0.0000	0.0000
LD-112-2.5'	0.0000	0.0000
LD-113-2.5'	0.0000	0.0000
LD-114-2.5'	0.0000	0.0000
LD-115-2.5'	0.0000	0.0000
LD-116-2.5'	0.0000	0.0000
LD-117-2.5'	0.0000	0.0000
LD-118-2.5'	0.0000	0.0000
LD-119-2.5'	0.0000	0.0000
LD-120-2.5'	0.0000	0.0000
LD-121-2.5'	0.0000	0.0000
LD-122-2.5'	0.0000	0.0000
LD-123-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
SOUTHERN LEG		
LD-124-2.5'	0.0000	0.0000
LD-125-2.5'	0.0000	0.0000
LD-126-2.5'	0.0000	0.0000
LD-127-2.5'	0.0000	0.0000
LD-128-2.5'	0.0000	0.0000
LD-129-2.5'	0.0000	0.0000
LD-130-2.5'	0.0000	0.0000
LD-131-2.5'	0.0000	0.0000
LD-132-2.5'	0.0000	0.0000
LD-133-2.5'	0.0000	0.0000
LD-134-2.5'	0.0000	0.0000
LD-135-2.5'	0.0000	0.0000
LD-136-2.5'	0.0000	0.0000
LD-137-2.5'	0.0000	0.0000
LD-138-2.5'	0.0000	0.0000
LD-139-2.5'	0.0000	0.0000
LD-140-2.5'	0.0000	0.0000
LD-141-2.5'	0.0000	0.0000
LD-142-2.5'	0.0000	0.0000
LD-143-2.5'	0.0000	0.0000
LD-144-2.5'	0.0000	0.0000
LD-145-2.5'	0.0000	0.0000
LD-146-2.5'	0.0000	0.0000
LD-147-2.5'	0.0000	0.0000
LD-148-2.5'	0.0000	0.0000
LD-149-2.5'	0.0000	0.0000
LD-150-2.5'	0.0000	0.0000
LD-151-2.5'	0.0000	0.0000
LD-152-2.5'	0.0000	0.0000
LD-153-2.5'	0.0000	0.0000
LD-154-2.5'	0.0000	0.0000
LD-155-2.5'	0.0000	0.0000
LD-156-2.5'	0.0000	0.0000
LD-157-2.5'	0.0000	0.0000
AIR	0.0000	0.0000
LD-158-2.5'	0.0000	0.0000
LD-159-2.5'	0.0000	0.0000
LD-160-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
SOUTHERN LEG		
LD-161-2.5'	0.0000	0.0000
LD-162-2.5'	0.0000	0.0000
LD-163-2.5'	0.0000	0.0000
LD-164-2.5'	0.0000	0.0000
LD-165-2.5'	0.0000	0.0000
LD-166-2.5'	0.0000	0.0000
LD-167-2.5'	0.0000	0.0000
LD-168-2.5'	0.0000	0.0000
LD-169-2.5'	0.0000	0.0000
LD-170-2.5'	0.0000	0.0000
LD-171-2.5'	0.0000	0.0000
LD-172-2.5'	0.0000	0.0000
LD-173-2.5'	0.0000	0.0000
LD-174-2.5'	0.0000	0.0000
LD-175-2.5'	0.0000	0.0000
LD-176-2.5'	0.0000	0.0000
LD-177-2.5'	0.0000	0.0000
LD-178-2.5'	0.0000	0.0000
LD-179-2.5'	0.0000	0.0000
LD-180-2.5'	0.0000	0.0000
LD-181-2.5'	0.0000	0.0000
LD-182-2.5'	0.0000	0.0000
LD-183-2.5'	0.0000	0.0000
LD-184-2.5'	0.0000	0.0000
LD-185-2.5'	0.0000	0.0000
LD-186-2.5'	0.0000	0.0000
LD-187-2.5'	0.0000	0.0000
LD-188-2.5'	0.0000	0.0000
LD-189-2.5'	0.0000	0.0000
LD-190-2.5'	0.0000	0.0000
LD-191-2.5'	0.0000	0.0000
LD-192-2.5'	0.0000	0.0000
LD-193-2.5'	0.0000	0.0000
LD-194-2.5'	0.0000	0.0000
LD-195-2.5'	0.0000	0.0000
LD-196-2.5'	0.0000	0.8100
LD-197-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
SOUTHERN LEG		
LD-198-2.5'	0.0000	0.0000
LD-199-2.5'	0.0000	0.0000
LD-200-2.5'	0.0000	0.0000
LD-201-2.5'	0.0000	0.0000
LD-202-2.5'	0.0000	0.0000
LD-203-2.5'	0.0000	0.0000
LD-204-2.5'	0.0000	0.0000
LD-205-2.5'	0.0000	0.0000
LD-206-2.5'	0.0000	0.0000
LD-207-2.5'	0.0000	0.0000
LD-208-2.5'	0.0000	0.0000
LD-209-2.5'	0.0000	0.0000
LD-210-2.5'	0.0000	0.0000
LD-211-2.5'	0.0000	0.0000
LD-212-2.5'	0.0000	0.0000
LD-213-2.5'	0.0000	0.0000
LD-214-2.5'	0.0000	0.0000
LD-215-2.5'	0.0000	0.0000
LD-216-2.5'	0.0000	0.0000
LD-217-2.5'	0.0000	0.0000
LD-218-2.5'	0.0000	0.0000
LD-219-2.5'	0.0000	0.0000
LD-220-2.5'	0.0000	0.0000
LD-221-2.5'	0.0000	0.0000
LD-222-2.5'	0.0000	0.0000
LD-223-2.5'	0.0000	0.0000
LD-224-2.5'	0.0000	0.0000
LD-225-2.5'	0.0000	0.0000
LD-226-2.5'	0.0000	0.0000
LD-227-2.5'	0.0000	0.0000
LD-228-2.5'	0.0000	0.0000
LD-229-2.5'	0.0000	0.0000
LD-230-2.5'	0.0000	0.0000
LD-231-2.5'	0.0000	0.0000
LD-232-2.5'	0.0000	0.0000
LD-233-2.5'	0.0000	0.0000
LD-234-2.5'	0.0000	0.0000
LD-235-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
SOUTHERN LEG		
LD-236-2.5'	0.0000	0.0500
LD-237-2.5'	0.0000	0.0000
LD-238-2.5'	0.0000	0.0000
LD-239-2.5'	0.0000	0.0000
LD-240-2.5'	0.0000	0.0000
LD-241-2.5'	0.0000	0.0000
LD-242-2.5'	0.0000	0.0000
LD-243-2.5'	0.0000	0.0000
LD-244-2.5'	0.0000	0.0000
LD-245-2.5'	0.0000	0.0000
LD-246-2.5'	0.0000	0.0000
LD-247-2.5'	0.0000	0.0000
LD-248-2.5'	0.0000	0.0000
LD-249-2.5'	0.0000	0.0000
LD-250-2.5'	0.0000	0.0000
LD-251-2.5'	0.0000	0.0000
LD-252-2.5'	0.0000	0.0000
LD-253-2.5'	0.0000	0.0000
LD-254-2.5'	0.0000	0.0000
LD-255-2.5'	0.0000	0.0000
LD-256-2.5'	0.0000	0.0000
LD-257-2.5'	0.0000	0.0000
AIR	0.0000	0.0000
LD-258-2.5'	0.0000	0.0000
LD-259-2.5'	0.0000	0.0000
LD-260-2.5'	0.0000	0.0000
LD-261-2.5'	0.0000	0.0000
LD-262-2.5'	0.0000	0.0000
LD-263-2.5'	0.0000	0.0000
LD-264-2.5'	0.0000	0.0000
LD-265-2.5'	0.0000	0.0000
LD-266-2.5'	0.0000	0.0000
LD-267-2.5'	0.0000	0.0000
LD-268-2.5'	0.0000	0.0000
LD-269-2.5'	0.0000	0.0000
LD-270-2.5'	0.0000	0.0000
LD-271-2.5'	0.0000	0.0000
LD-272-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
SOUTHERN LEG		
LD-273-2.5'	0.0000	0.0000
LD-274-2.5'	0.0000	0.0000
LD-275-2.5'	0.0000	0.0000
LD-276-2.5'	0.0000	0.0000
LD-277-2.5'	0.0000	0.0000
LD-278-2.5'	0.0000	0.0000
LD-279-2.5'	0.0000	0.0000
LD-280-2.5'	0.0000	0.0000
LD-281-2.5'	0.0000	0.0000
LD-282-2.5'	0.0000	0.0000
LD-283-2.5'	0.0000	0.0000
LD-284-2.5'	0.0000	0.0000
LD-285-2.5'	0.0000	0.0000
LD-286-2.5'	0.0000	0.0000
LD-287-2.5'	0.0000	0.0000
LD-288-2.5'	0.0000	0.0000
LD-289-2.5'	0.0000	0.0000
LD-290-2.5'	0.0000	0.0000
LD-291-2.5'	0.0000	0.0660
LD-292-2.5'	0.0000	0.0000
LD-293-2.5'	0.0000	0.0000
LD-294-2.5'	0.0000	0.0000
LD-295-2.5'	0.0000	0.0000
LD-296-2.5'	0.0000	0.0000
LD-297-2.5'	0.0000	0.0000
LD-298-2.5'	0.0000	0.0000
LD-299-2.5'	0.0000	0.0000
LD-300-2.5'	0.0000	0.0000
LD-301-2.5'	0.0000	0.0000
LD-302-2.5'	0.0000	0.0000
LD-303-2.5'	0.0000	0.0000
LD-304-2.5'	0.0000	0.0000
LD-305-2.5'	0.0000	0.0000
LD-306-2.5'	0.0000	0.0990
LD-307-2.5'	0.0000	1.8000
AIR	0.0000	0.0000
LD-308-2.5'	0.0000	2.8000
LD-309-2.5'	0.0000	8.4000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
SOUTHERN LEG		
LD-310-2.5'	0.0000	9.1000
LD-311-2.5'	0.0000	0.7200
LD-312-2.5'	0.0000	4.1000
LD-313-2.5'	0.0000	8.4000
LD-314-2.5'	0.0000	4.9000
LD-315-2.5'	0.0000	0.1100
LD-316-2.5'	0.0000	0.0570
LD-317-2.5'	0.0000	0.0000
LD-318-2.5'	0.0000	0.0000
LD-319-2.5'	0.0000	0.0000
LD-320-2.5'	0.0000	0.0000
LD-321-2.5'	0.0000	0.0000
LD-322-2.5'	0.0000	0.0000
LD-323-2.5'	0.0000	0.0000
LD-324-2.5'	0.0000	0.4500
LD-325-2.5'	0.0000	0.0000
LD-326-2.5'	0.0000	0.0000
LD-327-2.5'	0.0000	0.0000
LD-328-2.5'	0.0000	1.0000
LD-329-2.5'	0.0000	0.0000
LD-330-2.5'	0.0000	1.6000
LD-331-2.5'	0.0000	1.8000
LD-332-2.5'	0.0000	3.9000
LD-333-2.5'	0.0000	0.0000
LD-334-2.5'	0.0000	0.0000
LD-335-2.5'	0.0000	3.7000
LD-336-2.5'	0.0000	4.3000

SAMPLE	TRACER R mg/L	TVHC mg/L
NORTHERN LEG		
LD-98-2.5'	0.0000	0.0000
LD-99-2.5'	0.0000	0.0000
LD-100-2.5'	0.0000	0.0000
LD-101-2.5'	0.0000	0.0000
LD-102-2.5'	0.0000	0.0000
LD-103-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
NORTHERN LEG		
LD-104-2.5'	0.0000	0.0000
LD-105-2.5'	0.0000	0.0000
LD-106-2.5'	0.0000	0.0000
LD-107-2.5'	0.0000	0.0000
LD-108-2.5'	0.0000	0.0000
LD-109-2.5'	0.0000	0.2000
LD-110-2.5'	0.0000	0.0000
LD-337-2.5'	0.0000	0.0000
LD-338-2.5'	0.0000	0.0000
LD-339-2.5'	0.0000	0.0000
LD-340-2.5'	0.0000	0.0000
LD-341-2.5'	0.0000	0.0000
LD-342-2.5'	0.0000	0.0000
LD-343-2.5'	0.0000	0.2600
LD-344-2.5'	0.0000	0.0000
LD-345-2.5'	0.0000	0.0000
LD-346-2.5'	0.0000	0.0700
LD-347-2.5'	0.0000	0.1100
LD-348-2.5'	0.0000	0.2900
LD-349-2.5'	0.0000	1.9000
LD-350-2.5'	0.0000	0.8600
LD-351-2.5'	0.0000	0.1900
LD-352-2.5'	0.0000	0.3900
LD-353-2.5'	0.0000	0.0000
LD-354-2.5'	0.0000	5.0000
LD-355-2.5'	0.0000	0.0000
LD-356-2.5'	0.0000	0.1200
LD-357-2.5'	0.0000	12.0000
LD-358-2.5'	0.0000	2.7000
LD-359-2.5'	0.0000	2.7000
LD-360-2.5'	0.0000	0.0000
LD-361-2.5'	0.0000	0.0000
LD-362-2.5'	0.0000	0.0000
LD-363-2.5'	0.0000	0.0000
LD-364-2.5'	0.0000	0.0000
LD-365-2.5'	0.0000	0.0000
LD-366-2.5'	0.0000	0.0000
LD-367-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
NORTHERN LEG		
LD-368-2.5'	0.0000	0.0000
LD-369-2.5'	0.0000	0.0000
LD-370-2.5'	0.0000	0.0000
LD-371-2.5'	0.0000	0.0000
LD-372-2.5'	0.0000	0.0000
LD-373-2.5'	0.0000	0.0000
LD-374-2.5'	0.0000	0.0000
LD-375-2.5'	0.0000	0.0000
LD-376-2.5'	0.0000	0.0000
LD-377-2.5'	0.0000	0.0000
LD-378-2.5'	0.0000	0.0000
LD-379-2.5'	0.0000	0.0000
LD-380-2.5'	0.0000	0.0000
LD-381-2.5'	0.0000	0.0000
LD-382-2.5'	0.0000	0.0000
LD-383-2.5'	0.0000	0.0000
LD-384-2.5'	0.0000	0.0000
LD-385-2.5'	0.0000	0.0000
LD-386-2.5'	0.0000	0.0000
LD-387-2.5'	0.0000	0.0000
LD-388-2.5'	0.0000	0.0000
LD-389-2.5'	0.0000	0.0000
LD-390-2.5'	0.0000	0.0000
LD-391-2.5'	0.0000	0.0000
LD-392-2.5'	0.0000	0.0000
LD-393-2.5'	0.0000	0.0000
LD-394-2.5'	0.0000	0.0000
LD-395-2.5'	0.0000	0.0000
LD-396-2.5'	0.0000	0.0000
LD-397-2.5'	0.0000	0.0000
LD-398-2.5'	0.0000	0.0000
LD-399-2.5'	0.0000	0.0000
LD-400-2.5'	0.0000	0.0000
LD-401-2.5'	0.0000	0.0000
LD-402-2.5'	0.0000	0.0000
LD-403-2.5'	0.0000	0.0000
LD-404-2.5'	0.0000	0.0000
LD-405-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
NORTHERN LEG		
LD-406-2.5'	0.0000	0.0000
LD-407-2.5'	0.0000	0.0000
LD-408-2.5'	0.0000	0.0000
LD-409-2.5'	0.0000	0.0000
LD-410-2.5'	0.0000	0.0000
LD-411-2.5'	0.0000	0.0000
LD-412-2.5'	0.0000	0.0000
LD-413-2.5'	0.0000	0.6600
LD-414-2.5'	0.0000	0.0000
LD-415-2.5'	0.0000	0.0000
LD-416-2.5'	0.0000	0.0000
LD-417-2.5'	0.0000	0.0000
LD-418-2.5'	0.0000	0.0000
LD-419-2.5'	0.0000	0.0000
LD-420-2.5'	0.0000	0.0000
LD-421-2.5'	0.0000	0.3200
LD-422-2.5'	0.0000	0.0000
LD-423-2.5'	0.0000	0.2200
LD-424-2.5'	0.0000	1.0000
LD-425-2.5'	0.0000	0.0000
LD-426-2.5'	0.0000	2.4000
LD-427-2.5'	0.0000	0.0750
LD-428-2.5'	0.0000	0.7100
LD-429-2.5'	0.0000	0.0000
LD-430-2.5'	0.0000	0.0000
LD-431-2.5'	0.0000	0.0500
LD-432-2.5'	0.0000	0.0000
LD-433-2.5'	0.0000	0.0000
LD-434-2.5'	0.0000	0.5400
LD-435-2.5'	0.0000	0.8000
LD-436-2.5'	0.0000	0.0000
LD-437-2.5'	0.0000	0.0000
LD-438-2.5'	0.0000	0.0000
LD-440-2.5'	0.0000	0.0000
LD-441-2.5'	0.0000	0.0000
LD-442-2.5'	0.0000	0.0000
LD-443-2.5'	0.0000	0.0000
LD-444-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
NORTHERN LEG		
LD-445-2.5'	0.0000	0.0000
LD-446-2.5'	0.0000	0.0000
LD-447-2.5'	0.0000	0.0000
LD-448-2.5'	0.0000	0.0000
LD-449-2.5'	0.0000	0.0000
LD-450-2.5'	0.0000	0.0000
LD-451-2.5'	0.0000	0.0000
LD-452-2.5'	0.0000	0.0000
LD-453-2.5'	0.0000	0.0000
LD-454-2.5'	0.0000	0.0000
LD-455-2.5'	0.0000	0.0000
LD-456-2.5'	0.0000	0.0000
LD-457-2.5'	0.0000	0.0000
LD-458-2.5'	0.0000	0.0000
LD-459-2.5'	0.0000	0.0000
LD-460-2.5'	0.0000	0.0000
LD-461-2.5'	0.0000	0.0000
LD-462-2.5'	0.0000	0.0000
LD-463-2.5'	0.0000	0.0000
LD-464-2.5'	0.0000	2.5000
LD-465-2.5'	0.0000	3.4000
LD-466-2.5'	0.0000	0.0000
LD-467-2.5'	0.0000	0.0000
LD-468-2.5'	0.0000	6.3000
LD-469-2.5'	0.0000	0.5500
LD-470-2.5'	0.0000	1.3000
LD-471-2.5'	0.0000	0.1500
LD-472-2.5'	0.0000	0.0000
LD-473-2.5'	0.0000	2.7000
LD-474-2.5'	0.0000	0.0000
LD-475-2.5'	0.0000	0.0000
LD-476-2.5'	0.0000	0.0000
LD-477-2.5'	0.0000	0.1600
LD-478-2.5'	0.0000	0.0000
LD-479-2.5'	0.0000	0.0000
LD-480-2.5'	0.0000	0.0000
LD-481-2.5'	0.0000	0.0000
LD-482-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
NORTHERN LEG		
LD-483-2.5'	0.0000	1.1000
LD-484-2.5'	0.0000	0.0000
LD-485-2.5'	0.0000	0.0000
LD-486-2.5'	0.0000	0.0000
LD-487-2.5'	0.0000	4.8000
AIR	0.0000	0.0000
LD-488-2.5'	0.0000	0.0000
LD-489-2.5'	0.0000	0.0000
LD-490-2.5'	0.0000	0.9500
LD-491-2.5'	0.0000	2.3000
LD-492-2.5'	0.0000	0.1900
LD-493-2.5'	0.0000	2.3000
LD-494-2.5'	0.0000	3.3000
LD-495-2.5'	0.0000	0.4500
LD-496-2.5'	0.0000	2.3000
LD-497-2.5'	0.0000	3.4000
LD-498-2.5'	0.0000	4.7000
LD-499-2.5'	0.0000	9.8000
LD-500-2.5'	0.0000	8.3000
LD-501-2.5'	0.0000	0.2100
LD-502-2.5'	0.0000	0.0910
LD-503-2.5'	0.0000	0.0590
LD-504-2.5'	0.0000	0.1200
LD-505-2.5'	0.0000	4.1000
LD-506-2.5'	0.0000	0.5300
LD-506A-2.5'	0.0000	0.0000
LD-507-2.5'	0.0000	0.0000
LD-508-2.5'	0.0000	0.0000
LD-509-2.5'	0.0000	0.0000
LD-510-2.5'	0.0000	0.0000
LD-511-2.5'	0.0000	0.0000
LD-512-2.5'	0.0000	0.0000
LD-513-2.5'	0.0000	0.0000
LD-514-2.5'	0.0000	0.0000
LD-515-2.5'	0.0000	0.0970
LD-516-2.5'	0.0000	0.0000
LD-517-2.5'	0.0000	0.0000
LD-518-2.5'	0.0000	7.8000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
NORTHERN LEG		
LD-519-2.5'	0.0000	6.3000
LD-520-2.5'	0.0000	7.0000
LD-521-2.5'	0.0000	8.6000
LD-522-2.5'	0.0000	2.6000
LD-523-2.5'	0.0000	8.6000
LD-524-2.5'	0.0000	1.4000
LD-525-2.5'	0.0000	2.2000
LD-526-2.5'	0.0000	1.5000
LD-527-2.5'	0.0000	5.5000
LD-528-2.5'	0.0000	7.9000
LD-529-2.5'	0.0000	12.0000
LD-530-2.5'	0.0000	8.7000
LD-531-2.5'	0.0000	13.0000
LD-532-2.5'	0.0000	3.1000
LD-533-2.5'	0.0000	11.0000
LD-534-2.5'	0.0000	7.0000
LD-535-2.5'	0.0000	0.9600
LD-536-2.5'	0.0000	0.1500
LD-537-2.5'	0.0000	0.0000
LD-538-2.5'	0.0000	0.6900

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-539-2.5'	0.0000	1.9000
LD-540-2.5'	0.0000	0.0000
LD-541-2.5'	0.0000	0.0000
LD-542-2.5'	0.0000	0.1800
LD-543-2.5'	0.0000	3.5000
LD-544-2.5'	0.0000	2.8000
LD-545-2.5'	0.0000	0.7500
LD-546-2.5'	0.0000	3.1000
AIR	0.0000	0.0000
LD-547-2.5'	0.0000	0.0890
LD-548-2.5'	0.0000	1.9000
LD-549-2.5'	0.0000	0.6100

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-550-2.5'	0.0000	0.0000
LD-551-2.5'	0.0000	1.9000
LD-552-2.5'	0.0000	2.7000
LD-553-2.5'	0.0000	0.0580
LD-554-2.5'	0.0000	3.7000
LD-555-2.5'	0.0000	5.3000
LD-556-2.5'	0.0000	0.0000
TFA-1-2.5'	0.0000	7.8000
TFA-2-2.5'	0.0000	7.6000
TFA-3-2.5'	0.0000	0.0870
TFA-4-2.5'	0.0000	5.7000
TFA-5-2.5'	0.0000	5.3000
LD-557-2.5'	0.0000	3.2000
LD-558-2.5'	0.0000	6.3000
LD-559-2.5'	0.0000	6.6000
LD-560-2.5'	0.0000	7.6000
LD-561-2.5'	0.0000	4.4000
LD-562-2.5'	0.0000	2.7000
LD-563-2.5'	0.0000	3.0000
LD-564-2.5'	0.0000	7.3000
LD-565-2.5'	0.0000	3.2000
LD-566-2.5'	0.0000	7.0000
LD-567-2.5'	0.0000	6.6000
LD-568-2.5'	0.0000	6.5000
LD-569-2.5'	0.0000	5.1000
LD-570-2.5'	0.0000	5.3000
LD-571-2.5'	0.0000	2.2000
LD-572-2.5'	0.0000	0.0000
LD-573-2.5'	0.0000	0.0000
LD-574-2.5'	0.0000	0.0000
LD-575-2.5'	0.0000	2.2000
LD-576-2.5'	0.0000	2.5000
LD-577-2.5'	0.0000	3.8000
LD-578-2.5'	0.0000	3.8000
LD-579-2.5'	0.0000	0.1400
LD-580-2.5'	0.0000	0.0000
LD-581-2.5'	0.0000	0.1500
LD-582-2.5'	0.0000	1.5000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

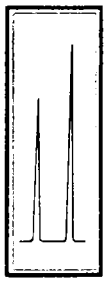
Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-583-2.5'	0.0000	1.7000
LD-584-2.5'	0.0000	0.0000
LD-585-2.5'	0.0000	0.7400
LD-586-2.5'	0.0000	1.2000
LD-587-2.5'	0.0000	0.0000
LD-588-2.5'	0.0000	0.0000
LD-589-2.5'	0.0000	1.3000
LD-590-2.5'	0.0000	1.4000
LD-591-2.5'	0.0000	0.0000
LD-592-2.5'	0.0000	0.6300
LD-593-2.5'	0.0000	0.0000
LD-594-2.5'	0.0000	0.0000
LD-595-2.5'	0.0000	0.0000
LD-596-2.5'	0.0000	0.4100
LD-597-2.5'	0.0000	0.0000
LD-598-2.5'	0.0000	0.0000
LD-599-2.5'	0.0000	0.6700
LD-600-2.5'	0.0000	0.5100
LD-611-2.5'	0.0000	0.8600
LD-612-2.5'	0.0000	0.0000
LD-613-2.5'	0.0000	0.0000
LD-614-2.5'	0.0000	0.0000
LD-615-2.5'	0.0000	0.0000
LD-616-2.5'	0.0000	0.0000
LD-617-2.5'	0.0000	0.0000
LD-618-2.5'	0.0000	0.0000
AIR	0.0000	0.0000
LD-619-2.5'	0.0020	6.3000
LD-621-2.5'	0.0001	2.2000
LD-622-2.5'	0.0000	0.0000
LD-623-2.5'	0.0000	0.4700
LD-624-2.5'	0.0000	0.0000
LD-625-2.5'	0.0000	0.0000
LD-626-2.5'	0.0000	0.0000
LD-627-2.5'	0.0000	0.0000
LD-628-2.5'	0.0000	0.0000
LD-629-2.5'	0.0000	0.0000
LD-630-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999



Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-631-2.5'	0.0000	0.0000
LD-632-2.5'	0.0000	0.0000
LD-633-2.5'	0.0000	0.0000
LD-634-2.5'	0.0000	0.0000
LD-635-2.5'	0.0000	0.0000
LD-636-2.5'	0.0000	0.0000
LD-637-2.5'	0.0000	0.0000
LD-638-2.5'	0.0000	0.0000
LD-639-2.5'	0.0000	0.0000
LD-640-2.5'	0.0000	0.1700
LD-641-2.5'	0.0000	0.1100
LD-642-2.5'	0.0000	0.0000
LD-643-2.5'	0.0000	0.0000
LD-644-2.5'	0.0000	0.0000
LD-645-2.5'	0.0000	0.0000
LD-646-2.5'	0.0000	1.3000
LD-647-2.5'	0.0000	0.0000
LD-648-2.5'	0.0000	0.0000
LD-649-2.5'	0.0000	0.0700
LD-650-2.5'	0.0000	0.0000
LD-651-2.5'	0.0000	0.0000
LD-652-2.5'	0.0000	0.1000
LD-653-2.5'	0.0000	0.4600
AIR	0.0000	0.0000
AIR	0.0000	0.0000
LD-654-2.5'	0.0000	0.0000
LD-655-2.5'	0.0000	0.0000
LD-656-2.5'	0.0000	0.0000
LD-657-2.5'	0.0000	0.0000
LD-658-2.5'	0.0000	0.0000
LD-659-2.5'	0.0000	0.0000
LD-660-2.5'	0.0000	0.0000
LD-661-2.5'	0.0000	0.0000
LD-662-2.5'	0.0000	0.0000
LD-663-2.5'	0.0000	0.0000
LD-664-2.5'	0.0000	0.0000
LD-665-2.5'	0.0000	0.0000
LD-666-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-685A-2.5'	0.0000	0.0000
LD-686A-2.5'	0.0000	0.0000
LD-687A-2.5'	0.0000	0.0000
LD-688A-2.5'	0.0000	0.0000
LD-689A-2.5'	0.0000	0.0000
LD-690-2.5'	0.0000	0.0000
LD-691-2.5'	0.0000	0.0000
LD-692-2.5'	0.0000	0.0000
LD-693-2.5'	0.0000	0.0000
LD-694-2.5'	0.0000	0.1700
LD-695-2.5'	0.0000	0.0000
LD-696-2.5'	0.0000	0.0000
LD-697-2.5'	0.0000	0.0000
LD-698-2.5'	0.0000	0.0000
LD-699-2.5'	0.0000	0.0000
LD-700-2.5'	0.0000	0.0000
LD-701-2.5'	0.0000	0.0000
LD-702-2.5'	0.0000	0.0000
LD-703-2.5'	0.0000	0.0000
LD-704-2.5'	0.0000	0.0000
LD-705-2.5'	0.0000	0.0000
AIR	0.0000	0.0000
LD-706-2.5'	0.0000	0.0000
LD-708-2.5'	0.0000	0.0000
LD-709-2.5'	0.0000	0.0000
LD-710-2.5'	0.0000	0.0000
LD-711-2.5'	0.0000	0.5900
LD-712-2.5'	0.0000	0.4100
LD-713-2.5'	0.0000	1.0000
LD-714-2.5'	0.0000	0.8700
LD-715-2.5'	0.0000	0.0760
LD-716-2.5'	0.0000	1.2000
LD-717-2.5'	0.0000	0.0740
LD-718-2.5'	0.0000	5.5000
LD-719-2.5'	0.0000	11.0000
LD-720-2.5'	0.0000	9.7000
LD-721-2.5'	0.0000	8.2000
LD-722-2.5'	0.0000	0.9000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-759-2.5'	0.0000	0.0000
LD-760-2.5'	0.0000	0.0000
LD-761-2.5'	0.0000	0.0000
LD-762-2.5'	0.0000	0.0000
LD-763-2.5'	0.0000	0.0000
LD-764-2.5'	0.0000	0.0000
LD-765-2.5'	0.0000	0.0000
LD-766-2.5'	0.0000	0.0000
LD-767-2.5'	0.0000	0.0000
LD-768-2.5'	0.0000	0.0000
LD-769-2.5'	0.0000	0.0500
LD-770-2.5'	0.0000	0.0000
LD-771-2.5'	0.0000	0.0000
LD-772-2.5'	0.0000	0.0000
LD-773-2.5'	0.0000	0.0000
LD-774-2.5'	0.0000	0.0000
LD-775-2.5'	0.0000	0.0000
LD-776-2.5'	0.0000	0.0000
LD-777-2.5'	0.0000	0.0000
LD-778-2.5'	0.0000	0.0000
LD-779-2.5'	0.0000	0.0000
AIR	0.0000	0.0000
LD-780-2.5'	0.0000	0.0000
LD-781-2.5'	0.0000	0.0000
LD-782-2.5'	0.0000	0.0000
LD-783-2.5'	0.0000	0.0000
LD-784-2.5'	0.0000	0.1200
LD-785-2.5'	0.0000	0.0000
LD-786-2.5'	0.0000	0.0000
LD-787-2.5'	0.0000	0.0000
LD-788-2.5'	0.0000	0.0000
LD-789-2.5'	0.0000	0.1200
LD-790-2.5'	0.0000	0.0000
AIR	0.0000	0.0000
LD-791-2.5'	0.0000	0.0000
LD-792-2.5'	0.0000	0.0000
LD-793-2.5'	0.0000	0.0000
LD-794-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-795-2.5'	0.0000	0.0000
LD-796-2.5'	0.0000	0.0000
LD-797-2.5'	0.0000	0.0800
LD-798-2.5'	0.0000	0.0000
LD-799-2.5'	0.0000	0.0000
LD-800-2.5'	0.0000	0.0000
LD-801-2.5'	0.0000	4.0000
LD-802-2.5'	0.0000	4.0000
LD-803-2.5'	0.0000	0.0000
LD-804-2.5'	0.0000	0.0000
LD-805-2.5'	0.0000	0.0000
LD-806-2.5'	0.0000	0.0000
LD-807-2.5'	0.0000	1.5000
LD-808-2.5'	0.0000	0.0000
LD-809-2.5'	0.0000	0.0000
LD-810-2.5'	0.0000	0.0520
LD-811-2.5'	0.0000	0.0000
LD-812-2.5'	0.0000	0.6000
LD-813-2.5'	0.0000	0.0000
AIR	0.0000	0.0000
LD-814-2.5'	0.0000	0.1800
LD-815-2.5'	0.0000	0.0000
LD-816-2.5'	0.0000	0.0000
LD-817-2.5'	0.0000	0.0000
LD-818-2.5'	0.0000	0.0000
LD-819-2.5'	0.0000	0.0000
LD-820-2.5'	0.0000	0.0000
LD-821-2.5'	0.0000	0.0000
LD-822-2.5'	0.0000	4.6000
LD-823-2.5'	0.0000	0.0000
LD-824-2.5'	0.0000	0.0000
AIR	0.0000	0.0000
LD-825-2.5'	0.0000	0.0580
LD-826-2.5'	0.0000	0.0000
LD-827-2.5'	0.0000	1.4000
LD-828-2.5'	0.0000	3.3000
LD-828-4'	0.0000	5.9000
LD-829-2.5'	0.0000	0.5300

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-830-2.5'	0.0000	0.0000
LD-831-2.5'	0.0000	0.0000
AIR	0.0000	0.0000
LD-835-2.5'	0.0001	2.9000
LD-836-2.5'	0.0000	0.0000
LD-837-2.5'	0.0000	0.6100
LD-838-2.5'	0.0000	1.1000
LD-839-2.5'	0.0000	0.0000
LD-840-2.5'	0.0000	0.0000
LD-841-2.5'	0.0000	0.0000
LD-842-2.5'	0.0000	0.0000
LD-843-2.5'	0.0000	0.0000
LD-844-2.5'	0.0000	0.0000
LD-845-2.5'	0.0000	0.8000
LD-846-2.5'	0.0000	1.5000
LD-847-2.5'	0.0000	0.4000
LD-848-2.5'	0.0000	0.4500
LD-849-2.5'	0.0000	0.2400
LD-850-2.5'	0.0000	0.0730
LD-851-2.5'	0.0000	0.0000
LD-852-2.5'	0.0000	0.0000
LD-853-2.5'	0.0000	0.0000
LD-854-2.5'	0.0000	0.0000
LD-855-2.5'	0.0000	0.0000
LD-856-2.5'	0.0000	0.0000
LD-857-2.5'	0.0000	0.0000
LD-858-2.5'	0.0000	0.6700
LD-859-2.5'	0.0000	0.0000
LD-860-2.5'	0.0000	0.0000
LD-861-2.5'	0.0000	0.0000
LD-862-2.5'	0.0000	0.0000
LD-863-2.5'	0.0000	0.5800
LD-864-2.5'	0.0000	0.0000
LD-865-2.5'	0.0000	0.7700
LD-866-2.5'	0.0000	0.7200
LD-867-2.5'	0.0000	0.0000
LD-868-2.5'	0.0000	0.4300
LD-869-2.5'	0.0000	0.1200

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-870-2.5'	0.0000	0.0000
LD-871-2.5'	0.0000	0.0710
LD-872-2.5'	0.0000	0.4100
LD-873-2.5'	0.0000	0.0000
AIR	0.0000	0.0000
LD-874-2.5'	0.0000	0.0000
LD-875-2.5'	0.0000	0.0570
LD-876-2.5'	0.0000	0.0000
LD-877-2.5'	0.0000	0.0000
LD-878-2.5'	0.0000	0.0000
LD-879-2.5'	0.0000	0.0000
LD-880-2.5'	0.0000	0.5300
LD-881-2.5'	0.0000	0.0000
LD-882-2.5'	0.0000	0.5000
LD-883-2.5'	0.0000	0.0800
LD-884-2.5'	0.0000	0.0000
LD-885-2.5'	0.0000	0.0000
LD-886-2.5'	0.0000	0.0000
LD-887-2.5'	0.0000	0.0000
LD-888-2.5'	0.0000	0.0000
LD-889-2.5'	0.0000	0.0000
LD-890-2.5'	0.0000	0.0000
LD-891-2.5'	0.0000	0.0000
LD-892-2.5'	0.0000	0.0000
LD-893-2.5'	0.0000	0.4800
LD-894-2.5'	0.0000	0.0000
LD-895-2.5'	0.0000	0.0630
LD-896-2.5'	0.0000	0.2500
LD-897-2.5'	0.0000	0.3400
LD-898-2.5'	0.0000	0.0000
LD-899-2.5'	0.0000	0.0000
LD-900-2.5'	0.0000	0.0000
LD-901-2.5'	0.0000	0.1500
LD-902-2.5'	0.0000	0.0000
LD-903-2.5'	0.0000	0.0000
LD-904-2.5'	0.0000	0.0000
LD-905-2.5'	0.0000	0.0000
LD-906-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-907-2.5'	0.0000	0.0000
LD-908-2.5'	0.0000	0.7100
LD-909-2.5'	0.0000	0.0000
LD-910-2.5'	0.0000	2.1000
LD-911-2.5'	0.0000	0.6800
LD-912-2.5'	0.0000	1.6000
LD-913-2.5'	0.0000	2.0000
LD-914-2.5'	0.0000	2.0000
LD-915-2.5'	0.0000	0.0000
LD-916-2.5'	0.0000	0.1200
LD-917-2.5'	0.0000	0.0770
LD-918-2.5'	0.0000	0.0000
LD-920-2.5'	0.0000	0.0000
LD-921-2.5'	0.0000	0.0000
LD-922-2.5'	0.0000	0.1400
LD-923-2.5'	0.0000	2.2000
LD-924-2.5'	0.0000	0.9900
LD-925-2.5'	0.0000	0.0000
LD-926-2.5'	0.0000	0.7700
LD-927-2.5'	0.0000	0.6100
LD-928-2.5'	0.0000	0.0000
LD-929-2.5'	0.0000	0.2800
LD-930-2.5'	0.0000	0.0000
LD-931-2.5'	0.0000	0.0000
LD-932-2.5'	0.0000	0.0000
LD-933-2.5'	0.0000	0.6000
LD-934-2.5'	0.0000	0.5200
LD-935-2.5'	0.0000	1.0000
LD-936-2.5'	0.0000	0.4400
LD-937-2.5'	0.0000	0.2500
LD-938-2.5'	0.0000	0.3900
LD-939-2.5'	0.0000	0.5300
LD-940-2.5'	0.0000	0.3500
LD-941-2.5'	0.0000	0.1500
LD-942-2.5'	0.0000	0.7000
LD-943-2.5'	0.0000	0.0000
LD-944-2.5'	0.0000	0.0000
LD-945-2.5'	0.0000	0.0610

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-946-2.5'	0.0000	0.0000
LD-947-2.5'	0.0000	0.5800
LD-948-2.5'	0.0000	0.8500
LD-949-2.5'	0.0000	2.1000
LD-950-2.5'	0.0000	0.6600
LD-951-2.5'	0.0000	0.0000
LD-952-2.5'	0.0000	0.0000
LD-953-2.5'	0.0000	0.0000
LD-954-2.5'	0.0000	0.1300
LD-955-2.5'	0.0000	0.6200
LD-956-2.5'	0.0000	0.0000
LD-957-2.5'	0.0000	0.8100
LD-958-2.5'	0.0000	0.0000
LD-959-2.5'	0.0000	0.0000
LD-960-2.5'	0.0000	0.7300
AIR	0.0000	0.0000
LD-961-2.5'	0.0000	0.0000
LD-962-2.5'	0.0000	0.0000
LD-963-2.5'	0.0000	0.0000
LD-964-2.5'	0.0000	0.6900
LD-965-2.5'	0.0000	0.0000
LD-966-2.5'	0.0000	0.2200
LD-967-2.5'	0.0000	0.7100
LD-968-2.5'	0.0000	0.5800
LD-969-2.5'	0.0000	0.1900
LD-970-2.5'	0.0000	0.0000
LD-971-2.5'	0.0000	0.0000
LD-972-2.5'	0.0000	0.0000
LD-973-2.5'	0.0000	0.0000
LD-974-2.5'	0.0000	0.0000
LD-975-2.5'	0.0000	0.0000
LD-976-2.5'	0.0000	0.0000
LD-977-2.5'	0.0000	0.0000
LD-978-2.5'	0.0000	0.3500
LD-979-2.5'	0.0000	0.0000
LD-980-2.5'	0.0000	0.0000
LD-981-2.5'	0.0000	0.0000
LD-982-2.5'	0.0000	2.9000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-983-2.5'	0.0000	17.0000
LD-984-2.5'	0.0000	6.2000
LD-985-2.5'	0.0000	3.1000
LD-986-2.5'	0.0000	0.1800
LD-987-2.5'	0.0000	0.0000
LD-988-2.5'	0.0000	0.0000
LD-989-2.5'	0.0000	0.0000
LD-990-2.5'	0.0000	0.0000
LD-991-2.5'	0.0000	0.0000
LD-992-2.5'	0.0000	0.0000
LD-993-2.5'	0.0000	0.0000
LD-994-2.5'	0.0000	0.0000
LD-995-2.5'	0.0000	0.0000
LD-996-2.5'	0.0000	0.0000
LD-997-2.5'	0.0000	0.0000
LD-998-2.5'	0.0000	0.0000
LD-999-2.5'	0.0000	0.0000
LD-1000-2.5'	0.0000	0.0000
LD-1001-2.5'	0.0000	0.0000
LD-1002-2.5'	0.0000	0.0000
LD-1003-2.5'	0.0000	0.0000
LD-1004-2.5'	0.0000	0.0000
LD-1005-2.5'	0.0000	0.0000
LD-1006-2.5'	0.0000	0.0000
LD-1007-2.5'	0.0000	0.0000
LD-1008-2.5'	0.0000	0.0000
LD-1009-2.5'	0.0000	0.0000
LD-1010-2.5'	0.0000	0.0000
LD-1011-2.5'	0.0000	0.0000
LD-1012-2.5'	0.0000	0.0000
LD-1013-2.5'	0.0000	0.0000
LD-1014-2.5'	0.0000	0.0000
LD-1015-2.5'	0.0000	0.0000
LD-1016-2.5'	0.0000	0.0000
LD-1017-2.5'	0.0000	0.0000
LD-1018-2.5'	0.0000	0.0000
LD-1019-2.5'	0.0000	0.0000
LD-1020-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-1021-2.5'	0.0000	0.0000
LD-1022-2.5'	0.0000	0.0000
LD-1023-2.5'	0.0000	0.0000
LD-1024-2.5'	0.0000	0.0000
LD-1025-2.5'	0.0000	0.0000
LD-1026-2.5'	0.0000	0.0000
LD-1027-2.5'	0.0000	0.2900
LD-1028-2.5'	0.0000	0.0000
LD-1028A-2.5'	0.0000	0.0000
LD-1029-2.5'	0.0000	0.0000
LD-1030-2.5'	0.0000	0.0000
LD-1031-2.5'	0.0000	0.0000
LD-1032-2.5'	0.0000	2.4000
LD-1033-2.5'	0.0000	0.0000
LD-1034-2.5'	0.0000	0.0000
LD-1035-2.5'	0.0000	0.0000
LD-1036-2.5'	0.0000	0.2700
LD-1037-2.5'	0.0000	0.0000
LD-1038-2.5'	0.0000	0.0000
LD-1039-2.5'	0.0000	0.0000
LD-1040-2.5'	0.0000	0.0000
LD-1041-2.5'	0.0000	0.0000
LD-1042-2.5'	0.0000	0.0000
LD-1043-2.5'	0.0000	0.0000
LD-1044-2.5'	0.0000	0.0000
LD-1045-2.5'	0.0000	0.0000
LD-1046-2.5'	0.0000	0.0000
LD-1047-2.5'	0.0000	0.0000
LD-1048-2.5'	0.0000	0.0000
LD-1049-2.5'	0.0000	0.0000
LD-1050-2.5'	0.0000	0.0000
LD-1051-2.5'	0.0000	0.0000
LD-1052-2.5'	0.0000	0.0000
LD-1053-2.5'	0.0000	0.0000
LD-1054-2.5'	0.0000	0.0000
LD-1055-2.5'	0.0000	0.0000
LD-1056-2.5'	0.0000	0.0000
LD-1057-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-1058-2.5'	0.0000	0.0000
LD-1059-2.5'	0.0000	0.0000
LD-1060-2.5'	0.0000	0.0000
LD-1061-2.5'	0.0000	0.0000
LD-1062-2.5'	0.0000	0.0000
LD-1063-2.5'	0.0000	0.0000
LD-1064-2.5'	0.0000	0.0000
LD-1065-2.5'	0.0000	0.0000
LD-1066-2.5'	0.0000	0.0000
LD-1067-2.5'	0.0000	0.0000
LD-1068-2.5'	0.0000	0.0000
LD-1069-2.5'	0.0000	0.0000
LD-1070-2.5'	0.0000	0.0000
LD-1071-2.5'	0.0000	0.0000
LD-1072-2.5'	0.0000	0.0000
LD-1073-2.5'	0.0000	0.0000
LD-1074-2.5'	0.0000	0.0000
LD-1075-2.5'	0.0000	0.0000
LD-1076-2.5'	0.0000	0.0000
LD-1077-2.5'	0.0000	0.0000
LD-1078-2.5'	0.0000	0.1100
LD-1079-2.5'	0.0000	0.0000
LD-1080-2.5'	0.0000	1.3000
LD-1081-2.5'	0.0000	0.0000
LD-1082-2.5'	0.0000	0.0000
LD-1083-2.5'	0.0000	1.4000
LD-1084-2.5'	0.0000	0.0000
LD-1085-2.5'	0.0000	0.0000
LD-1086-2.5'	0.0000	0.0000
LD-1087-2.5'	0.0000	0.0000
LD-1088-2.5'	0.0000	0.0000
LD-1089-2.5'	0.0000	0.0580
LD-1090-2.5'	0.0000	1.5000
LD-1091-2.5'	0.0000	0.8400
LD-1092-2.5'	0.0000	0.8400
LD-1093-2.5'	0.0000	0.0000
LD-1094-2.5'	0.0000	0.0000
LD-1095-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

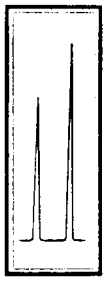
Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-1096-2.5'	0.0000	0.0000
LD-1097-2.5'	0.0000	1.6000
LD-1098-2.5'	0.0000	0.0000
LD-1099-2.5'	0.0000	0.0000
LD-1100-2.5'	0.0000	2.9000
LD-1101-2.5'	0.0000	0.0000
LD-1102-2.5'	0.0000	0.0000
LD-1103-2.5'	0.0000	1.4000
LD-1104-2.5'	0.0000	2.9000
LD-1105-2.5'	0.0000	0.2400
LD-1106-2.5'	0.0000	0.0000
LD-1107-2.5'	0.0000	0.0000
LD-1108-2.5'	0.0000	0.0000
LD-1109-2.5'	0.0000	0.0000
LD-1110-2.5'	0.0000	0.0000
LD-1111-2.5'	0.0000	0.0000
LD-1112-2.5'	0.0000	0.0000
LD-1113-2.5'	0.0000	0.0000
LD-1114-2.5'	0.0000	0.0000
LD-1115-2.5'	0.0000	0.0000
LD-1116-2.5'	0.0000	2.5000
LD-1117-2.5'	0.0000	3.1000
LD-1118-2.5'	0.0000	2.6000
LD-1119-2.5'	0.0000	0.1800
LD-1120-2.5'	0.0000	1.3000
LD-1121-2.5'	0.0000	2.2000
LD-1122-2.5'	0.0000	0.0000
LD-1123-2.5'	0.0000	0.0000
LD-1124-2.5'	0.0000	0.0000
LD-1125-2.5'	0.0000	0.0000
LD-1126-2.5'	0.0000	0.0000
LD-1127-2.5'	0.0000	0.0000
LD-1128-2.5'	0.0000	0.0000
LD-1129-2.5'	0.0000	0.0000
LD-1130-2.5'	0.0000	0.0000
LD-1131-2.5'	0.0000	0.0000
LD-1132-2.5'	0.0000	0.0000
LD-1133-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999



Marine Corps Air Station
Cherry Point, North Carolina

Annual Tightness Test
Condensed Data

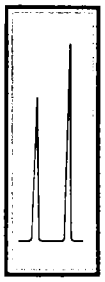
SAMPLE	TRACER R mg/L	TVHC mg/L
FLIGHTLINE LEG		
LD-1134-2.5'	0.0000	3.5000
LD-1135-2.5'	0.0000	3.1000
LD-1136-2.5'	0.0000	1.5000
LD-1137-2.5'	0.0000	0.3400
LD-1138-2.5'	0.0000	2.5000
LD-1139-2.5'	0.0000	0.0000
LD-1140-2.5'	0.0000	0.0000
LD-1141-2.5'	0.0000	0.0000
LD-1142-2.5'	0.0000	0.0000
LD-1143-2.5'	0.0000	0.0000
LD-1144-2.5'	0.0000	0.0000
AIR	0.0000	0.0000
AIR	0.0000	0.0000
LD-1145-2.5'	0.0000	0.0000
LD-1146-2.5'	0.0000	0.0000
LD-1147-2.5'	0.0000	0.1100
LD-1148-2.5'	0.0000	0.0000
LD-1149-2.5'	0.0000	2.7000
LD-1150-2.5'	0.0000	2.5000
LD-1151-2.5'	0.0000	0.8300
LD-1152-2.5'	0.0000	0.0000
LD-1153-2.5'	0.0000	0.0000
LD-1154-2.5'	0.0000	0.0000
LD-1155-2.5'	0.0000	0.1900
LD-1156-2.5'	0.0000	0.9400
LD-1157-2.5'	0.0000	0.2800
LD-1158-2.5'	0.0000	2.3000
LD-1159-2.5'	0.0000	0.0000
LD-1160-2.5'	0.0000	0.0000

Detection Limits:
Tracer = 0.0001 mg/L
TVHC = 0.0500 mg/L

Not Detected = 0.0000
No Sample = -999999

APPENDIX C: Maps

APPENDIX D: Results of U.S. Standard Evaluation



APPENDIX E: Procedures

The *Tracer Tight* test was performed in two phases; inoculation, and testing (sample collection and analysis). Typical procedures for each phase are outlined below.

E.1 INOCULATION

Inoculation is the introduction of a highly volatile liquid or gaseous compound, a tracer, into the product of the tank and/or piping to be tested. An amount of tracer is added to the product to achieve a concentration not to exceed five parts per million. Tracer is inoculated into the tank's product utilizing the following procedure:

I. Each fuel system is inspected for leaks at valves and piping connections. Any problem areas are repaired or isolated before inoculation can proceed.

II. Product levels are obtained from the tank owner or from tank gauges prior to inoculation. Calculations are made to determine the amount of tracer needed to reach the desired concentration. For pipeline inoculation, fuel is moved throughout the system from inoculated bulk tanks or by product transfer.

III. The tracer compound is shipped to the site in a pre-pressurized canister. The pressure assures that all the tracer will be dispensed into the tank.

IV. The tracer is introduced through a drop tube to the bottom of the tank. This drop tube is inserted through the gauging hatch in the top of the tank. The tracer canister is attached to the drop tube and tracer is dispensed into the bottom portion of the tank.

E.2 SAMPLING

Tracer Tight testing involves collecting soil vapor samples from permanent probes previously installed in the soil around the fueling system. A total of one thousand one hundred sixty-three (1163) soil vapor samples were collected. Sampling is performed by evacuating each probe for a designated amount of time determined by the observed vacuum reading at each probe. Evacuation of the probe is designed to remove any ambient air and two to three probe volumes to ensure a representative sample of the soil vapors surrounding the probes is collected. After evacuation is complete, a 30cc syringe is attached to each probe by an adapter and soil vapor sample is drawn into the syringe and dispensed into an evacuated canister. This procedure is repeated until a total volume of 120cc are collected in the sampling canister.

E.3 ANALYTICAL PARAMETERS

For this investigation, the sampling canisters were analyzed on-site by a Tracer Research Corporation mobile analytical laboratory. A subsample was taken from each canister and was injected into a laboratory grade Hewlett Packard gas chromatograph (GC).

Analytical instruments were calibrated three times a day using gaseous and aqueous standards and reagent blanked solvents.

E.3.1 Chromatographic System

A Hewlett Packard 5890 series II gas chromatograph, equipped with a flame ionization detector (FID) and an electron capture detector (ECD) along with two computing integrators were used for the analyses. The FID was used to detect total volatile hydrocarbons (TVHC) and the ECD was used to detect the tracer compound. The columns were in a temperature controlled oven and nitrogen was used as the carrier gas.

The following paragraphs explain the ECD and FID processes.

E.3.1.1 GC Process

The soil vapor is injected into the GC where it is swept through the analytical column by the carrier gas. The components of the sample pass through the column at different rates, according to their individual properties, and are detected by the detector. The detector senses the presence of a component different from the carrier gas and converts that information into an electrical signal. Compounds are identified by the time it takes them to pass through the column (retention times).

E.3.1.2 FID Process

The FID utilizes a flame produced by the combustion of hydrogen and air. When a component, which has been separated on the GC analytical column, is introduced into the flame, a large increase in ions occurs. A polarizing voltage is applied to an ion collector near the flame. The ions are attracted to the collector, producing a current which is proportional to the amount of sample analyte in the flame. The electrical current causes the computing integrator to record a peak on the chromatogram. By measuring the area of the peak and comparing that area to the integrator response of a known standard, the concentration of the analyte in the sample is determined.

E.3.1.3 ECD Process

The ECD principle arises from the phenomenon that electron negative species can react with thermal electrons present to form negatively charged ions. The loss of these electrons is directly related to the quantity of the analyte in the injected sample. In order to produce capturable (low level) thermal electrons, the carrier gas is ionized by beta particles from a radioactive source placed in the detector cell. This electron flow produces a small current, which is collected and measured. When the sample molecule is introduced into the cell, electrons which would otherwise be collected at the detector electrode are captured by the sample, resulting in decreased current. This change is the quantitative basis for the ECD.

E.3.1.4 Analyses

The detection limits for a target compound depends on the sensitivity of the detector to the individual compound as well as the volume of the sample injection. The detection limits of the target compounds were calculated from the response factor, the sample injection size, and the calculated minimum peak size(area) observed under the conditions of the analysis. The detection limit for the target compounds, Tracer R and TVHC, are 0.0001 mg/L and 0.0500 mg/L respectively.

E.4 QUALITY ASSURANCE AND QUALITY CONTROL

E.4.1 Test Quality and Validity

In order to assure test quality and validity, Tracer Research Corporation has incorporated quality control measures into each phase of the *Tracer Tight* test. These control measures are designed to verify system efficiency and eliminate false detection's. These control measures include:

Analytical Equipment Calibration - The gas chromatograph is tested for sensitivity and accuracy utilizing a known concentration standard. Calibration is performed at least twice a day and upon any detection of tracer.

Ambient Background Samples - Ambient background samples are taken periodically during the sampling process at locations adjacent to the top of sampling probes. These ambient background samples monitor for any tracer contamination caused by tank venting and normal fuel system operation. These data collected from the samples are compared to test sample concentrations. Adjustments are then made taking any background contamination into consideration.

Quality Assurance and Quality Control Review - All analytical data and job logs are reviewed by Tracer Research Corporation's report staff. Chromatography, concentration calculations and job procedures are verified to assure test results.

E.4.2 Sampling Probes

Permanent probes are capped immediately following installation to seal the probe from foreign contaminants. Each probe is re-capped after sampling to protect the probe for further use.

E.4.2.1 Sampling Efficiency

Soil gas pumping is monitored by a vacuum gauge to ensure that an adequate flow of gas from the soil is maintained. A reliable soil gas sample can be obtained if the sample vacuum gauge reading is at least 2 inches Hg less than the maximum measured vacuum of the vacuum pump.

E.5 ANALYTICAL QUALITY ASSURANCE

Quality assurance samples are performed at the minimum frequencies listed in Table A. The actual frequency depends on the number of samples analyzed each day and the length of time of the survey.

Table A: Quality Assurance Samples

Sample type	Frequency
Ambient Air Samples	1 per site or every 19 samples
Field System Blank	1 per day
Reagent Blank	1 per set of working standards

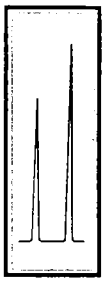
The ambient air samples are obtained on-site by sampling the air in the immediate area. Analytical method blanks are taken to demonstrate that the analytical instrumentation is not contaminated. These are performed by injecting carrier gas (nitrogen) into the GC with the sampling syringe. The sub-sampling syringes are also checked in this fashion.

Continuing calibration checks are analyzed to verify the detector response for the target VOCs. If the response changes by more than twenty-five percent, the gas chromatograph is recalibrated and new response factors are calculated.

System blanks are analyzed to check for contamination of the sampling apparatus (e.g. probe and sampling syringe). A sample is collected using standard soil gas sampling procedures, but without putting the probe into the ground. The results are compared to those obtained from a concurrently analyzed ambient air sample.

A reagent blank is performed to ensure the solvent used to dilute the stock standards is clean. Analytical instruments are calibrated daily using fresh working standards made from National Institute of Sciences and Technology traceable standards and reagent blanked solvents.

The injector port septa through which samples are injected into the GC are replaced daily to prevent possible gas leaks from the chromatographic column. All sampling and subsampling syringes are decontaminated after use and are not used again until they have been decontaminated by washing in anionic detergent and baking at 90 degrees Celsius or higher.



Tracer Research Corporation appreciates the opportunity to do business with your organization. We constantly strive to improve our service and are very interested in any comments or suggestions you may have about how we can be more responsive to the needs of your company. Should you have any questions or wish to share your comments about the field work performed, analytical results obtained, or this report, please call Jim Rinehart or Marj Stivers at 800-303-4523. Thank you for your business.