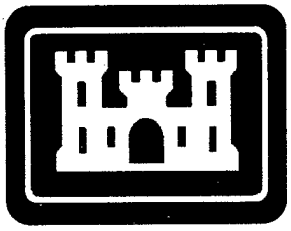

US Army Corps of Engineers

Toxic and Hazardous Materials Agency

Task Order No. 6

Phase I: Pilot Test to Determine the Feasibility of Using Explosives as Supplemental Fuel at Hawthorne Army Ammunition Plant (HWAAP) Hawthorne, Nevada

Contract Number DAAA15-88-D-0010
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April 1991

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19. ABSTRACT FOR THE HAWTHORNE ARMY AMMUNITION PLANT

This report outlines the operational aspects of Phase I, a pilot study that evaluated the feasibility of firing a conventional boiler with a fuel supplemented by explosives. Five test runs were conducted to evaluate the performance of the boiler. Three test runs were conducted firing fuel oil only to establish baseline emissions and efficiency characteristics. Two tests were conducted firing an explosives-laden solution consisting of fuel oil, toluene, and TNT. The concentration of TNT in the solutions was 1% and 15% by weight. Stack testing was conducted during some of the runs to determine particulate, and destruction and removal efficiencies (DRE).

The results of the test indicate that dilute concentrations of TNT can be fired effectively in the boiler. Combustion characteristics and boiler efficiency were not greatly affected by the explosives. The DRE for TNT was above 99.99%. The emission of nitrous oxides (NO_x) from the stack exhaust was evaluated during all tests and found to increase significantly when the explosives solution was fired in the boiler.

The operation of the solution preparation system and boiler was troublesome during the high-concentration (15%) TNT test. Crystallization and precipitation of the TNT from the solution resulted in poor firing characteristics. The solution could be fired into the boiler only after dilution with additional solvents and fuel oil.

The report contains recommendations for equipment modifications and procedures to effectively fire high-explosives concentration solutions.

Phase II will be conducted at Hawthorne Army Ammunition Plant (HWAAP) to implement the recommendations from Phase I. Twelve to 14 test runs will be conducted in Phase II.

FINAL REPORT

INSTALLATION RESTORATION PROGRAM
ENVIRONMENTAL TECHNOLOGY DEVELOPMENT

TASK ORDER 6
PHASE I: PILOT TEST TO DETERMINE THE FEASIBILITY OF USING EXPLOSIVES AS SUPPLEMENTAL FUEL AT HAWTHORNE ARMY AMMUNITION PLANT (HWAAP) HAWTHORNE, NEVADA

April 1991

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1. EXECUTIVE SUMMARY

The U.S. Army generates significant quantities of off-specification and scrap energetic or explosives materials. Energetic materials are also contained in obsolete and unserviceable munitions. Disposal options for these energetic materials are limited because current methods such as open burning and open detonation are being restricted by environmental regulations. Incineration of explosives in a water slurry is a known method of disposal but it is expensive.

The U.S. Army Toxic and Hazardous Materials Agency (USATHAMA) is investigating technologies to safely and effectively destroy energetic and explosive materials. Previous laboratory-scale testing conducted by USATHAMA has shown that blending of explosives with fuel oil and burning of the resultant mixture can be completed successfully. As a result of the previous study, a pilot-scale system was constructed for mixing explosives such as 2,4,6-trinitrotoluene (TNT) and hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) in fuel oil and firing the resulting mixture into an industrial boiler to generate steam. The pilot system was erected at Hawthorne Army Ammunition Plant (HWAAP), which is located in Hawthorne, NV. The pilot test program was conducted during the period from 21 October 1990 through 2 December 1990.

The objectives of the testing were to determine the effectiveness of destruction of explosives, to characterize the gaseous effluent, to identify operational and safety problems and parameters, and to evaluate the potential for future use of the technology on full-scale applications.

The test equipment used for execution of the project was specifically designed and purchased for the testing. The equipment included a system to store solvents (solvents were used to increase the solubility of explosives in fuel oil); a system to mix and heat the solvents and explosives; a blending system to mix the explosives-laden solvent with fuel oil; a standard industrial water tube boiler equipped with the capability of firing fuel oil, explosives-laden fuel oil solution, or a combination of both; and a system to control and modulate the flow of steam generated by the boiler. All equipment was provided with instruments to continuously monitor the operation of the system.

The test equipment was designed to meet the strict safety standards involved in the handling of explosives and volatile solvents. A complete safety review was made prior to operational testing.

During operational testing, five tests were conducted. Three tests were completed using fuel oil only and were used to characterize the boiler combustion characteristics, particularly nitrous oxide emissions at excess air levels ranging from 20% to 30%. The final two tests were conducted using solutions of 1% and 15% TNT in toluene and fuel oil. Stack tests were completed to characterize

the emissions from the test evaluating the 1% TNT solution. Operational problems involving the pumping of the 1% explosives solution (the air diaphragm pump encountered icing problems) resulted in the need to cofire the solution with fuel oil. During the test evaluating the 15% TNT solution, the solution crystallized in the piping and system tanks. The 15% TNT test was concluded only after further additions of toluene and acetone.

Five of the six criteria established for a successful demonstration were met. The testing demonstrated that:

- A destruction and removal efficiency (DRE) of 99.99% was met while cofiring a solution containing TNT and fuel oil into the boiler.

- The emissions of nitrous oxides (NO_x) for typical operation of the boiler were characterized to range from 110 to 93 ppm as excess air ranged from 20% to 30%, respectively. When the system fired explosives solution or cofired explosives solution, the NO_x increased significantly.

- The successful operation of the boiler on the TNT solution was maintained provided that a consistent, stable, and clean (i.e., particulate-free) supply of feed solution was maintained to the burner. The modifications to the pilot system necessary to maintain the stable supply of feed solution have been identified.

- The primary operational and safety problem resulted from the inability to dissolve the TNT in fuel oil and solvent (particularly in the 15% TNT case) and to keep the TNT in solution.

- Heat balances were completed on the test data from the boiler system and were found to be within 15% of closure, which is within the expected accuracy of the measurements.

The test data were not able to characterize the operational parameters affecting the explosives destruction and combustion efficiency. Operational problems with maintaining the explosives in solution and monitoring a precise flow rate to the solution burner were not overcome. The equipment and procedures need to be further developed to obtain these data.

In addition to the pre-established criteria, the testing demonstrated that:

- The particulate emissions measured while burning explosives were similar to emissions measured when firing fuel oil only. The average emission rate of 0.008 grains per dry standard cubic foot were an order of magnitude below

the emission levels required by the Resource Conservation and Recovery Act (RCRA) regulations.

- The boiler system was >60% efficient in recovering heat from the fuel. The boiler efficiency was not affected by the firing of solutions containing TNT.

- The combustion efficiency was typically 99.9% or greater when firing fuel oil and solutions containing 1% TNT. The combustion efficiency fell to 99.5% when the boiler was fired with solutions containing elevated concentrations of TNT.

As a result of the testing, a considerable number of modifications to the existing pilot-scale system were identified. These modifications are related to improving the ability to dissolve, blend, and fire the explosives-based solution. The modifications include:

- Providing dry, heated air for operation of the pneumatic actuated valves and equipment, particularly the diaphragm circulating pump.

- Providing a means of heating the contents of the main blending tank and all solution handling equipment (i.e., piping, valves, and instruments).

- Improving the measurement method to determine the flow to the explosives solution burner.

- Allowing remote adjustment of atomizing air to the fuel oil and explosives solution burners.

- Improving the instruments that monitor the quantity and consistency of the explosives solution.

Additionally, further study of the solubility characteristics of TNT in fuel oil and toluene is recommended to develop better operational procedures.

The technology has exhibited potential as an effective method to recover heat (i.e., usable energy) from waste explosives. The number of problematic issues with handling the solution appear to be correctable at the pilot scale. It is recommended that the handling problems be resolved at the pilot scale prior to application at full scale. Also, many of the issues relating to undissolved TNT are expected to be applicable in a system containing RDX (RDX is insoluble in toluene). Before pilot-scale application is conducted for destruction of RDX and other explosives, it is recommended that the handling problems associated with the TNT-based solution be resolved.

2. INTRODUCTION

2.1 Background. The U.S. Army currently generates approximately 2.5 million pounds (lb) of scrap or off-specification energetic materials (explosives) each year. In addition, it is estimated that at least 14 million lb of energetic materials are contained in obsolete or unserviceable munitions. The primary constituents of these waste energetic materials are 2,4,6-trinitrotoluene (TNT), hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), and Comp B (a mixture of 40% TNT and 60% RDX).

Currently, these waste energetic materials are disposed by open air burning/detonation, or by carefully controlled incineration. To avoid the potential for environmental concerns involved in open air burning/detonation and the high costs associated with incineration of water/explosive slurries, an alternative waste management technology has been investigated. This technology results in the recovery of the heating value of these energetic materials by blending the wastes in fuel oil and burning the resulting mixture in an industrial boiler for steam generation. Previous efforts to develop this technology were conducted by Oak Ridge National Laboratory and, based on the preliminary results and conclusions of these efforts[1], a pilot-scale test of the technology was conducted.

Phase I of the pilot test consisted of five test runs and was conducted from 21 October 1990 through 2 December 1990 at Hawthorne Army Ammunition Plant (HWAAP), which is located in Hawthorne, NV. Two explosive concentrations were evaluated to determine the efficiency of the pilot system. Virgin explosives (raw material used in the production of munitions) were used for pilot test activities. This pilot study was based on a test plan that outlined the operational aspects of the pilot test.[2] Findings of the pilot study are included herein.

2.2 Objectives of the pilot test. The overall objective of the pilot test was to conduct an evaluation of the use of explosives as fuel oil supplements in Army industrial boilers. Specific objectives included:

(a) Determination of the effectiveness of a conventional boiler to destroy explosives [destruction and removal efficiency (DRE) of the system].

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[1]Oak Ridge National Laboratory. "Pilot-Scale Testing of a Fuel-Oil Explosives Cofiring Process for Recovering Energy from Waste Explosives." Prepared for USATHAMA. USATHAMA Reference AMXTH-TECR-88272. May 1988.

[2]Test Plan--Task Order No. 6. "Pilot Test to Determine the Feasibility of Using Explosives as Supplemental Fuel at Hawthorne Army Ammunition Plant (HWAAP), Hawthorne, NV." April 1989, Revised August 1990.

(b) Characterization of gaseous effluents from the process, particularly with respect to increased oxides of nitrogen (NO_x) emissions resulting from the addition of the nitrated explosives.

(c) Identification of operational parameters that affect explosive destruction and combustion efficiency.

(d) Identification of any safety-related process or operational aspects that might affect implementation of this technology.

(e) Evaluation of modifications required to employ the technology using conventional, existing boilers at Army installations.

2.3 Purpose of the report. The purpose of this report is to outline the operational aspects of a pilot test and to present the methodology, results, and conclusions of the pilot investigation that evaluated the feasibility of using explosives as supplemental fuel in industrial boilers. Discussions of the process equipment; test variables; operational parameters; and sampling, analysis, and monitoring procedures are contained herein.

2.4 Criteria for a successful demonstration. Prior to beginning the test work, a set of criteria for successful demonstration was established. The pilot demonstration would be considered a success if the following criteria are satisfied:

(a) The analytical results of stack emissions indicate that a DRE of explosives of at least 99.99% is feasible while maintaining boiler capacity.

(b) The gaseous effluents from the process, particularly NO_x emissions, are fully characterized for various operating conditions.

(c) The operational parameters that affect explosive destruction and combustion efficiency are identified.

(d) Process or operational aspects that affect the safety of the system are identified; modifications for full-scale implementation are recommended.

(e) A steady stream of pressurized steam is produced during boiler operation (for potential use during full-scale implementation).

(f) The heat balance determined using data collected during the pilot study is within 10% of the theoretical heat balance.

3. TEST SITE

3.1 Test site location and description. The pilot study was conducted at HWAAP, which is located in Hawthorne, NV. HWAAP was established in 1929 by the U.S. Navy. Current operations at HWAAP include the receipt, storage, inventory, maintenance, demilitarization, demolition, and testing of ammunition. HWAAP encompasses 246,000 acres of land situated in the west-central section of Nevada in Mineral County. Hawthorne is located approximately 160 miles southeast of Reno, NV, along Route 95. A site location map for the installation is provided in Figure 3-1. The areas utilized for pilot study activities are shown in Figure 3-2.

The pilot study was conducted in the Western Area Demilitarization Facility (WADF), which is located in the northernmost section of HWAAP.

The following existing buildings were used during pilot study activities (all buildings are underground, or, if aboveground, they are hardened):

(a) Building 117-1 (Services and Support Building)--Area designated for off-site coordination personnel.

(b) Building 117-4 (Bulk Incineration Building)--Command Center, lunch room, decontamination area, source for extension of utilities, etc.

(c) Building 117-14 (Magazine Group B Building)--Storage area for bulk explosives.

To execute the test program, the new equipment, consisting of the boiler and mixing system, was installed adjacent to Bulk Incineration Building 117-4.

3.2 Safety procedures. Prior to operation of the pilot system, safety plans were submitted, reviewed, and approved. Safety submissions included:

(a) Safety Plan for Pilot Test to Determine the Feasibility of Using Explosives as Supplemental Fuel at Hawthorne Army Ammunition Plant, Hawthorne, NV, prepared by Roy F. Weston, Inc., April 1989.

(b) Hazard Analyses of Fuel Oil/Explosive Test Boiler System at Hawthorne Army Ammunition Plant, prepared by Hercules Incorporated, Allegany Ballistics Laboratory, April 1990.

(c) Site Safety Plan/Site Safety Submission for Pilot Test to Determine Feasibility of Using Explosives as Supplemental Fuel at Hawthorne Army Ammunition Plant, Hawthorne, NV, prepared by Roy F. Weston, Inc., April 1990.

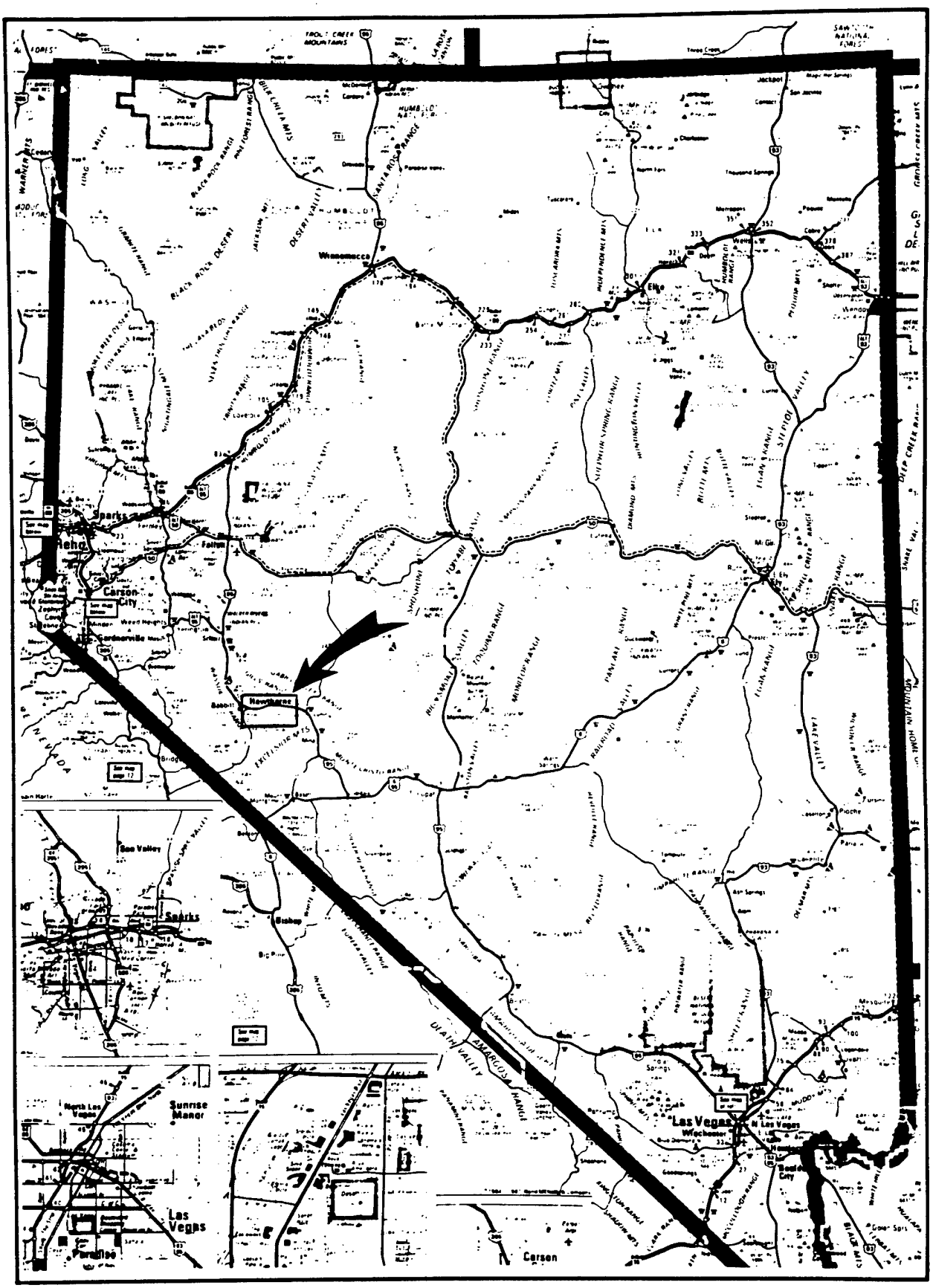

Figure 3-1. Location map of Hawthorne Army Ammunition Plant (HWAAP).

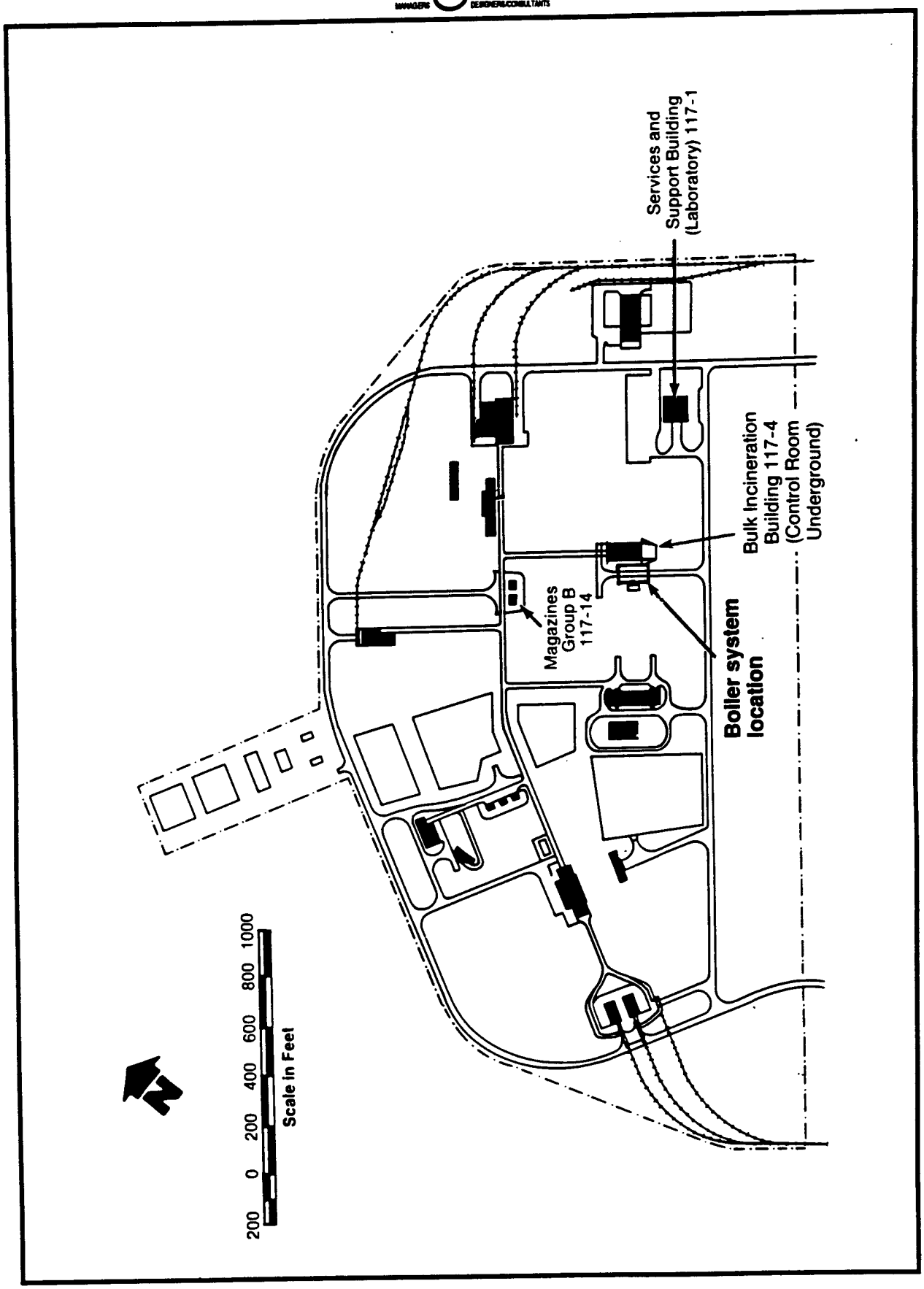

Figure 3-2. Plot plan of Hawthorne Army Ammunition Plant (HWAAP) with pilot study site identified.

These plans discussed the engineering, design, siting, and operational hazards and safety requirements. The safety submissions were reviewed by:

- Department of Defense Explosives Safety Board, Alexandria, VA.
- U.S. Army Technical Center for Explosive Safety, Savanna, IL.
- U.S. Army Material Command Field Safety Activity, Charlestown, ID.
- U.S. Army Armament, Munitions, and Chemical Command, Rock Island, IL.
- Hawthorne Army Ammunition Plant Safety Branch, Hawthorne, NV.
- USATHAMA, Health and Safety Branch, Aberdeen, MD.

The final review and approval for operations were completed in August 1990.

4. DESCRIPTION OF PROCESS EQUIPMENT

The process equipment consisted of the following major items:

(a) Solvent drums.
(b) Explosives dissolving system.
(c) Fuel/explosives blending tank.
(d) Boiler.
(e) Steam vent system.
(f) Boiler management system.
(g) Support utilities.

A process flow diagram of the equipment is shown in Figure 4-1. While the boiler was fired with fuel oil, a designated mass of explosives (TNT) was dissolved into a quantity of solvent (toluene) in the explosives dissolving system. The amount was dependent on the test conditions. The explosives/solvent solution was indirectly heated to about 100°F to facilitate mixing and dissolution. Steam generated while the boiler fired fuel oil was used as the heating medium. The explosives/solvent solution was mixed with fuel oil and continuously circulated in the fuel/explosives blending tank. The fuel/solvent/explosives liquid was fired to the boiler.

The explosives were dissolved in a solvent prior to mixing with fuel oil to increase the explosives' solubility in fuel oil. Toluene was the selected solvent because of its ability to dissolve TNT, it is readily available, it is inexpensive, and it is miscible in No. 2 fuel oil. RDX, a component (40%) of Comp B, is not soluble in toluene. The mixture of Comp B, toluene, and fuel oil was expected to be a dilute slurry. The remainder of this report refers to the explosives, solvent, and fuel oil mixture as the explosives solution.

The explosives solution and fuel oil were fired in the boiler to generate steam. A sufficient quantity of excess air was maintained during operation to ensure complete combustion of the fuel oil and explosives solution. Exhaust gases from the boiler were sampled and vented to the atmosphere. During operations, the steam entered the steam vent system where the pressure drop across a flow control valve condensed a portion of the steam. Condensate was collected and discharged into the feed water tank. Steam exhaust discharged to the atmosphere.

Two temporary operations were used during startup or decontamination activities. Fuel oil was fed to the boiler during startup to bring the system to sufficient operating temperatures and to produce steam for heating the explosives dissolving system. The fuel oil feed was designed as a temporary operation to be shut off when the explosives solution was introduced to the boiler for testing. During testing, however, the delivery of explosives solution was erratic and a stable flame could not be maintained during the tests; therefore, the fuel oil was cofired with the explosives solution. Also, following each test run, the explo-

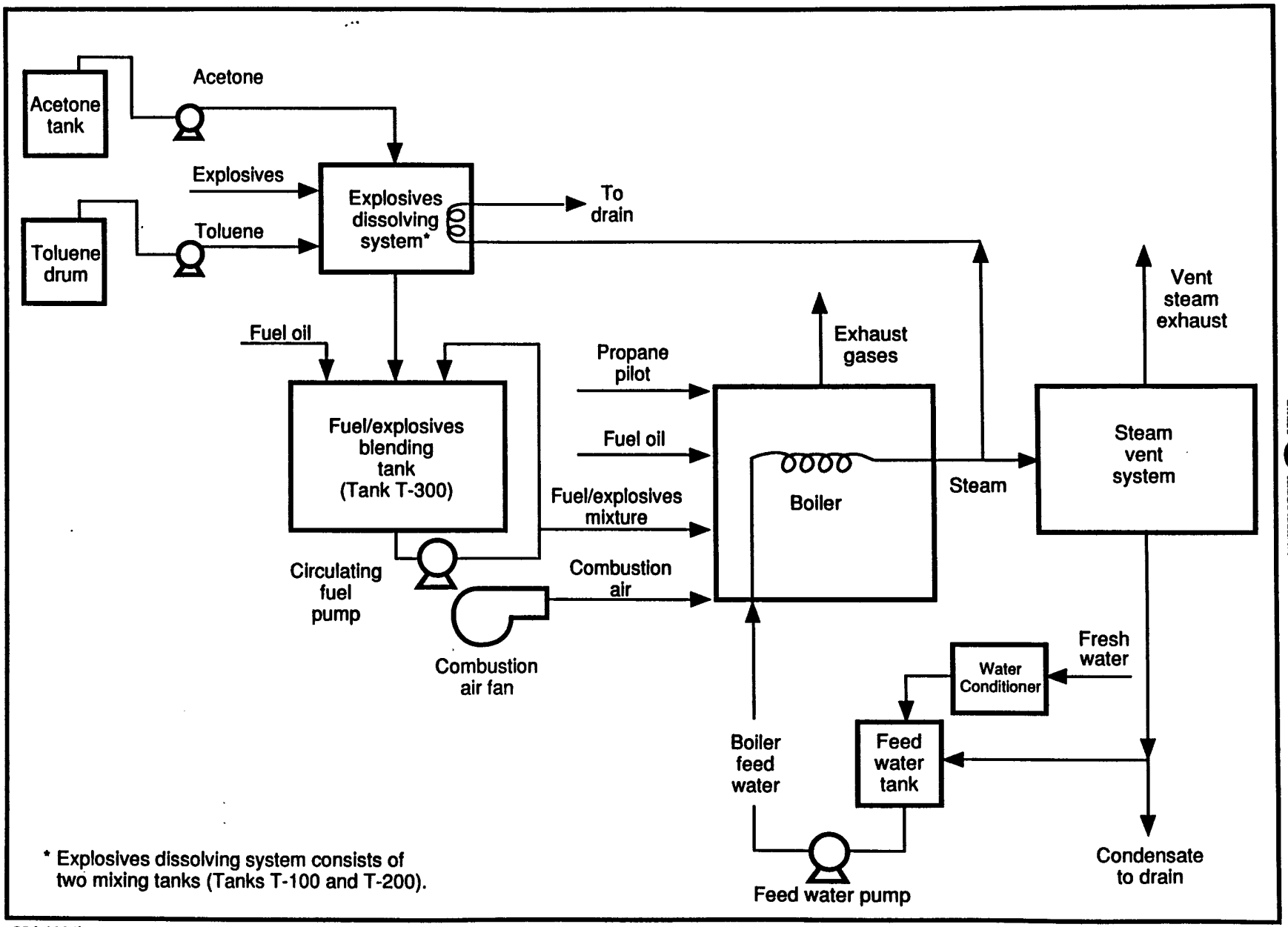

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Figure 4-1. Process flow diagram.

sives dissolving system and fuel/explosives blending tank were flushed with acetone to remove residual contamination. Acetone was selected because of the high solubility of TNT and RDX in this solvent.

The main process equipment was procured from two primary vendors: Sun Combustion, Inc. of Bethlehem, PA, and El Dorado Engineering of Salt Lake City, UT. Sun Combustion provided the boiler and steam vent system. El Dorado Engineering provided the feed dissolving and blending system. The equipment provided by Sun Combustion contained numerous design errors and problems. Sun Combustion was often unavailable for support in correcting these errors. As such, repair parts and modifications were made independent of Sun Combustion.

All equipment used for the pilot test was designed to conform to the appropriate electrical classification rating. Equipment associated with the feed and blending system was designed to meet Class I, Division II (explosion-proof in flammable liquid and vapor atmosphere) and Class II, Division I (explosion-proof in flammable dust atmosphere) criteria. The boiler system was designed to meet Class I, Division II criteria. WESTON equipment, such as the continuous emission monitoring (CEM) system and support equipment, was located at sufficiently safe distances; compliance with the explosion-proof criteria was not required. Detailed descriptions of the process equipment are contained in the following subsections.

4.1 Solvent drums. Acetone was delivered to the site in 55-gal metal drums. Acetone was transferred manually from the drums into a 230-gal carbon steel tank. A chemical-resistant hand pump was used to transfer the acetone from the drums into the acetone tank. The acetone tank was designed with a water jacket to provide cooling. The testing was completed in late fall, and the tank cooling system was not utilized. The acetone storage tank was also equipped with a vent valve and flame arrester to release solvent fumes during filling.

Toluene was also delivered to the test site in 55-gal drums. The quantity of toluene used during each test was transferred into a standard 30-gal drum. The 30-gal drum was located on a mechanical weigh scale. The scale was used to measure the quantity of liquid solvent used in each test. The weigh scale had a 1,000-lb maximum capacity.

Solvent was transferred from the storage containers (tank or drum) to either of the two explosives dissolving system tanks by air operated drum pumps. Both drum pumps were equipped with piston-type flow switches in the solvent pipeline. The flow switches were designed to indicate when the drum pump was no longer transferring liquid (i.e., drum empty). The flow switches installed originally were undersized (0.1 gpm). The flow switches were replaced with properly sized units (1.0 gpm). After replacement with appropriately sized switches, operation was still

unreliable. For future operations, an alternate flow monitoring switch is needed.

4.2 Explosives dissolving system. Two tanks were used to dissolve explosives. The tanks, designated as T-100 and T-200, had approximate capacities of 30 gal and 50 gal, respectively. Dimensional information on both tanks is provided in Figure 4-2. Selection of the appropriate tank depended on the operating conditions of the test run (i.e., mass of explosives and quantity of toluene required). Both tanks were constructed of 304 stainless steel and were equipped with covers. The tank covers were provided with access ports for the following items:

- An air actuated mechanical mixer.
- A float-type high/low level sensor.
- A port for adding explosives and inspecting the tank interior.

The tanks were indirectly heated using steam and were insulated. Control of steam heating in each tank was maintained using an automatic control valve. Each steam control valve was independently actuated by a capillary sensor inserted into the capillary well that extended into the base of each dissolving tank. The two dissolving tanks were equipped with air operated kettle valves for draining into the fuel/explosives blending tank. As shown in Figure 4-3, Tanks T-100 and T-200 were elevated, allowing for gravity draining of the liquids.

4.3 Fuel/explosives blending tank. The fuel/explosives blending tank was constructed of 304 stainless steel. The blending tank, designated as Tank T-300, had an approximate capacity of 75 gal. The cover on Tank T-300 contained two access ports: one for the level sensor and the second for an air actuated mixer. Tank T-300 was insulated but not steam-heated. Tank T-300 drained through an air operated kettle valve into the circulating pump. The fuel oil and explosives solution was circulated by an air diaphragm pump. The pump was designed to recirculate at 20 gallons per minute (gpm) at a maximum pressure of 80 pounds per square inch gauge (psig). The pump was equipped with a Teflon-diaphragmed tranquilizer to suppress pulsing in the discharge line. The piping from the pump discharge was configured to allow the solution to be circulated to the boiler, Tank T-100, Tank T-200, or to a dump tank (55-gal drum located adjacent to the feed system skid).

Overflow from Tanks T-100, T-200, and T-300 was piped to a 30-gal drum. The overflow drum, Tank T-300, and circulating pump were contained in a secondary containment area on the feed skid. Figure 4-4 shows the location of blending tank system. The air diaphragm pump proved troublesome. Ice deposits in the pump's air cylinder stopped the pump frequently. Ice formed because of the high moisture content of compressed air and low ambient temperature

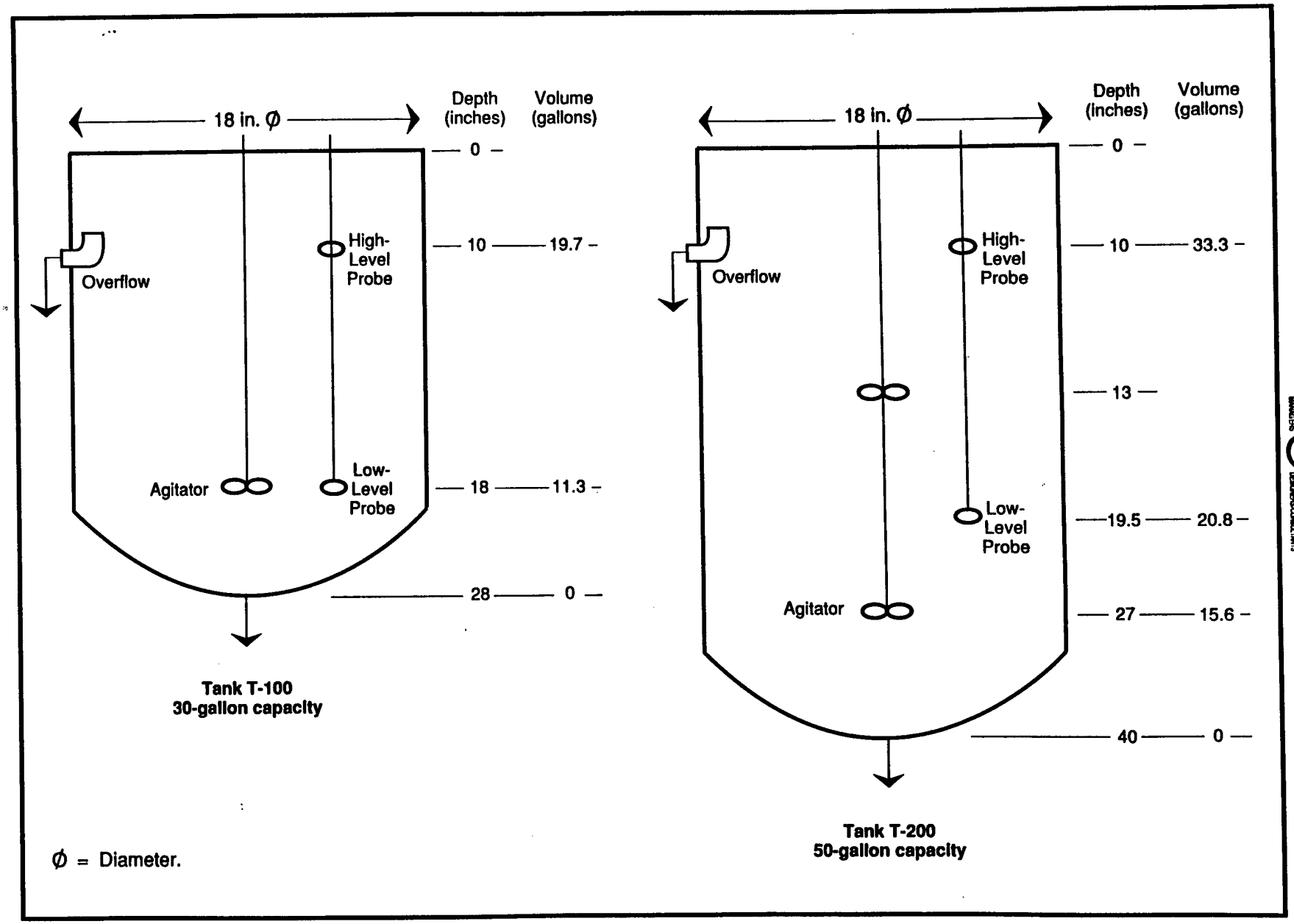

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Figure 4-2. Dissolving tank dimensions (not to scale).

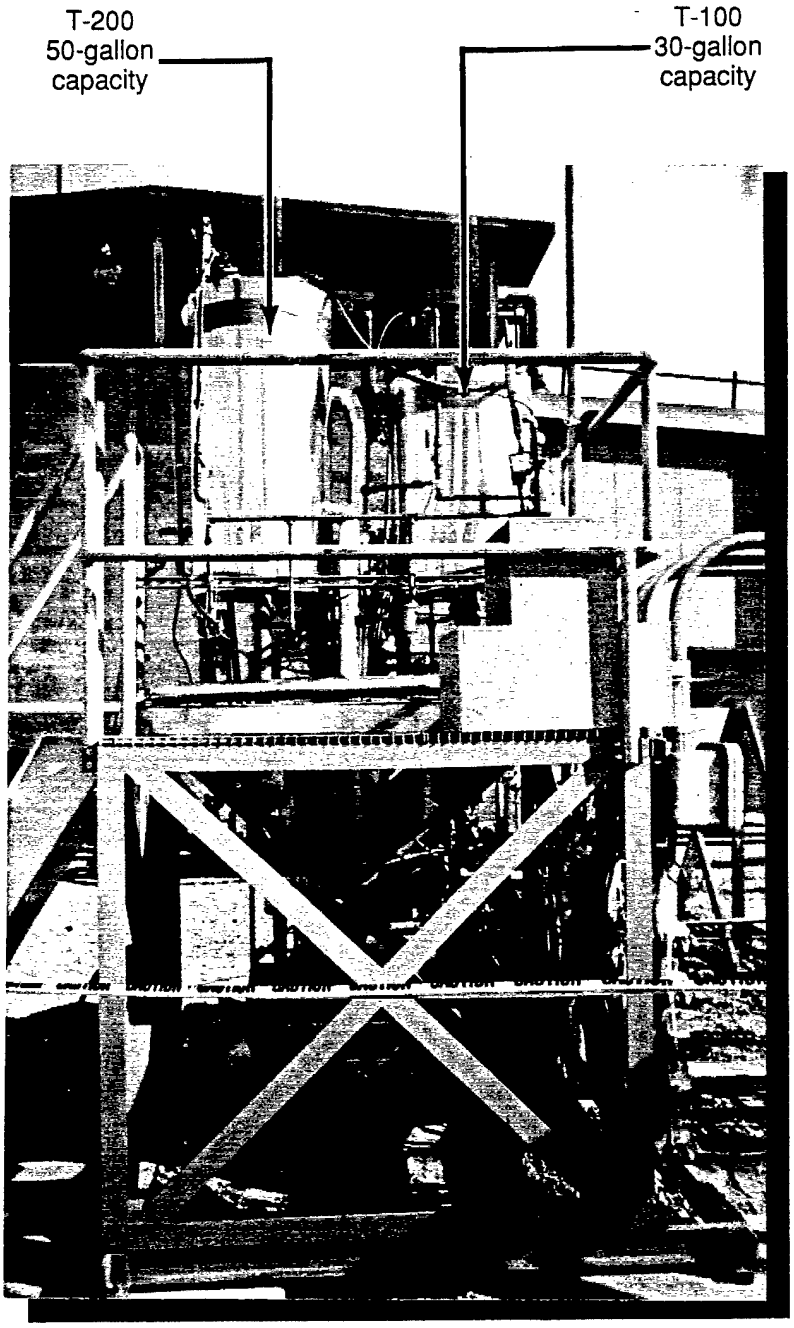

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Figure 4-3. Elevated dissolving tanks (T-100 and T-200) viewed from the west.

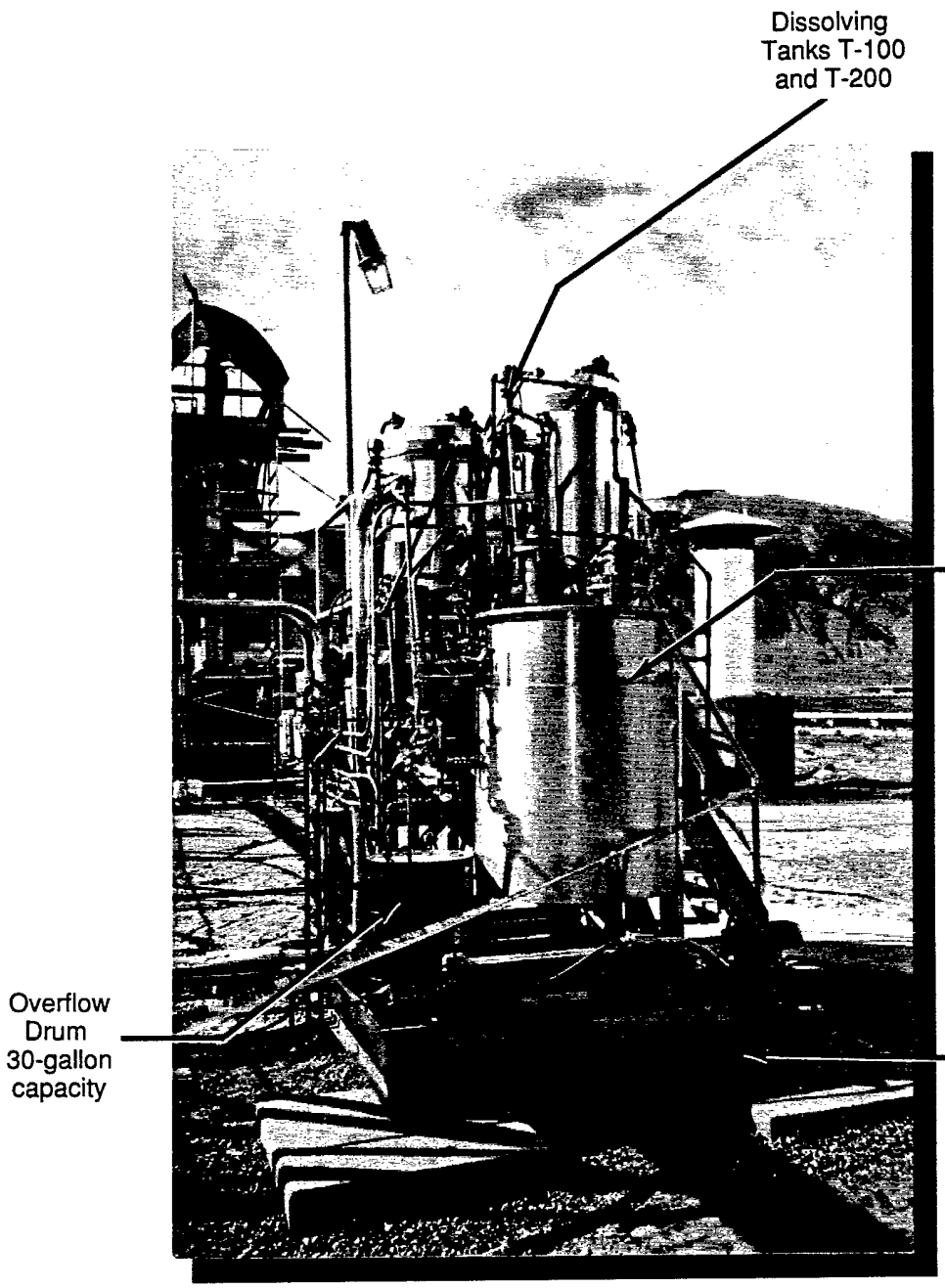

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Figure 4-4. Blending tank (Tank T-300) viewed from the east.

conditions. During operation, the pump was heated using an external steam hose to avoid freezing conditions.

4.4 Boiler. The boiler system constructed for the project was a Cleaver Brooks Model M4-2000 water tube-type boiler. This boiler was designed to generate 1,649 lb/hr of steam (ratings based on 212°F and 1,000 ft above sea level). The boiler was a standard low-pressure model capable of producing steam up to a pressure of 15 psig. The standard boiler was modified to meet the required electrical specifications and was equipped with three customized burner assemblies. These customized burners were provided for the propane pilot, the fuel oil, and the explosives solution. The burner systems are described in Subsections 4.4.1 through 4.4.3.

The boiler was mounted on a skid and provided with a detachable stack. The stack was 12 in. in diameter and extended 20 ft above the top of the boiler housing. A photograph of the boiler system with stack is shown in Figure 4-5.

Combustion air was provided by an integral forced-draft (FD) fan supplied with the boiler. The fan was equipped with a 1-horse power (hp) electric motor and damper actuator meeting the Class I, Division II criteria. During startup, the low combustion air switch that provided a flame safety interlock was found to be oversized [trip point: 5 to 16 inches of water gauge (inwg)]. After replacement with a correctly sized switch (trip point: 0.03 to 0.3 inwg), the boiler operated properly; however, the replacement switch failed after a few weeks of operation. The failure of the new and sensitive combustion air switch is believed to be caused by the pulsing nature of combustion in the boiler. This switch was not operational at the conclusion of the project.

4.4.1 Propane burner. The propane burner was conceptually designed to provide a continuous pilot for the boiler. The propane piping comprised:

- A regulator to reduce the pressure of incoming gas from 5 psig to 10 inwg.
- Low- and high-pressure gas switches.
- A series of two block valves.
- A vent valve to release gas trapped between the two block valves.

The propane was ignited by an electrical spark. Ignition of the pilot was often difficult; and once ignited, control of gas flow with the pressure regulator was not successful. A 0.25-in. needle valve was installed prior to the burner to reduce the flow of gas into the burner. The needle valve provided much more reliable propane control; however, the valve routinely required adjustment. Recommendations for improvements to the gas pilot are provided in Subsection 10.2.

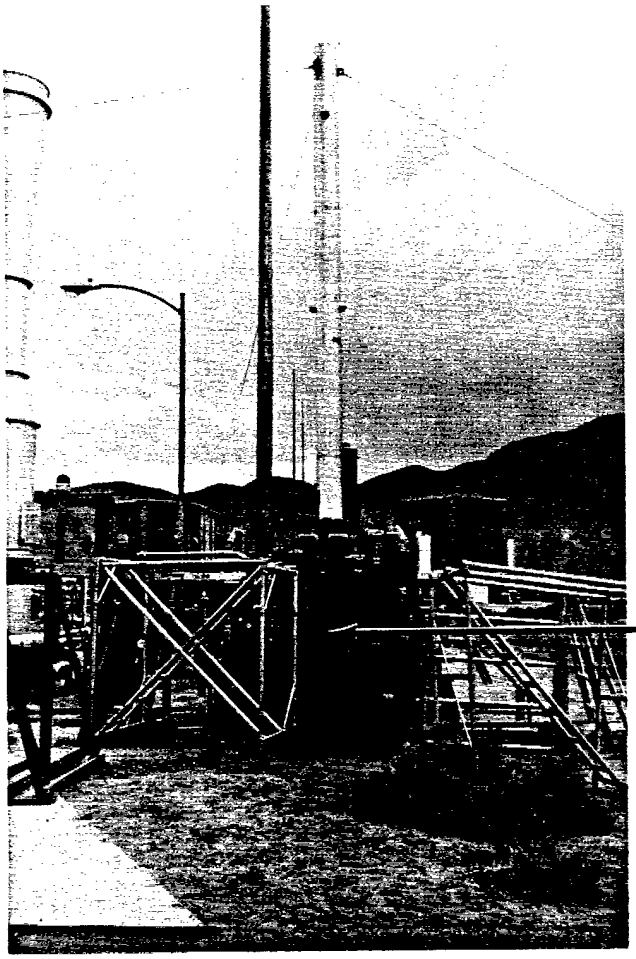

Figure 4-5. Boiler with stack.

During operation, it was not practical to maintain a continuous pilot with the equipment provided. The propane, which burned cleanly during startup conditions, did not completely combust when fired simultaneously with fuel oil. Large deposits of soot formed on the end of the pilot burner during cofiring. The soot covered the sparking mechanism, making reignition impossible. The pilot control mechanism was changed to fire only during startup.

4.4.2 Fuel oil burner. The fuel oil burner supplied with the boiler was a custom-designed air atomized oil burner. The fuel oil was supplied to the burner pipe train at 50 psig. The burner pipe train illustrated in Figure 4-6 comprised:

- A pressure regulator.
- A low-pressure oil switch.
- A high-pressure oil switch.
- A two-way control valve.
- A three-way block valve.

The two-way control valve used initially to regulate the flow of fuel to the burner was oversized. The valve stem and seat were replaced with a V-port design. The new design provided improved flow and pressure characteristics.

The three-way motorized block valve directed flow to the burner nozzle during firing and recycled flow to the fuel oil storage tank during shutdown conditions. The valve was supplied with an actuator that erroneously failed in the open position (fuel to the burner) during a loss of power. To correct this undesirable situation, the discharge lines of the three-way valve were reversed, and, thereafter, the fuel oil system operated properly.

The burner used to fire the fuel oil into the boiler was a sonic air atomized type nozzle. The burner assembly for firing fuel oil into the boiler consisted of two concentric pipes with a sonic air atomized nozzle located at the tip. The concentric pipes were independently connected with quick disconnects and flexible hoses to the fuel oil burner pipe train and compressed air system. The compressed air was injected through the inner pipe of the assembly. An orifice in the burner nozzle increases the air velocity above the speed of sound. The liquid fuel was supplied in the annulus. The liquid was injected into the compressed air stream through a series of orifices located at the tip of the nozzle. The high-velocity air and liquid created a fine spray of fuel droplets suitable for combustion. A resonator cap on the discharge of the burner nozzle assists in producing finely atomized droplets of fuel. A schematic diagram of this type of burner is shown in Figure 4-7. Two burner nozzles were provided: 0.064- and 0.045-in. diameter liquid orifices. During startup testing, both nozzles were tested. The 0.064-in. diameter burner nozzle provided the appropriate fuel flow rates and the cleanest combustion characteristics. During burner adjustment, the highest combustion

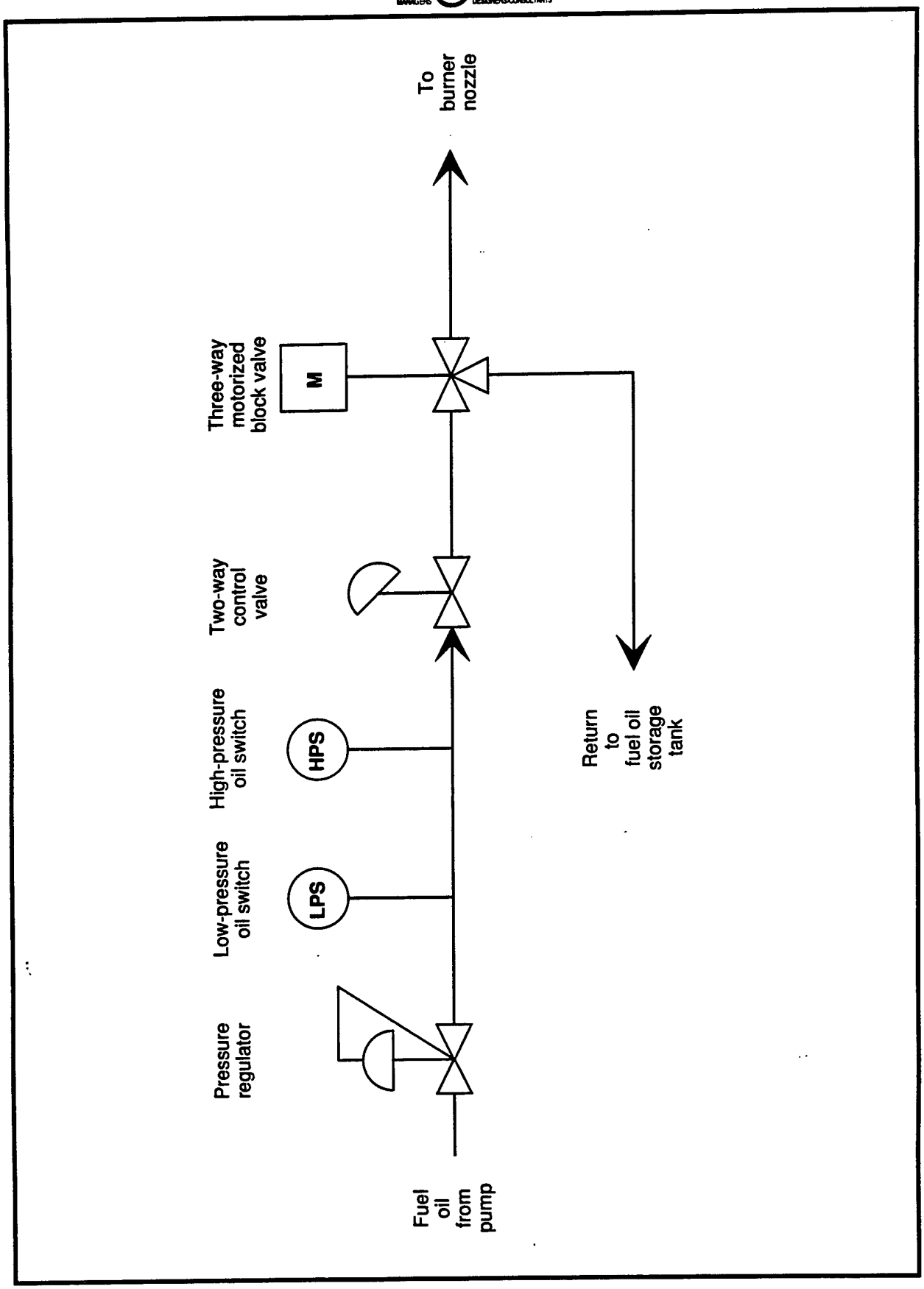

Figure 4-6. Schematic of fuel oil burner pipe train.

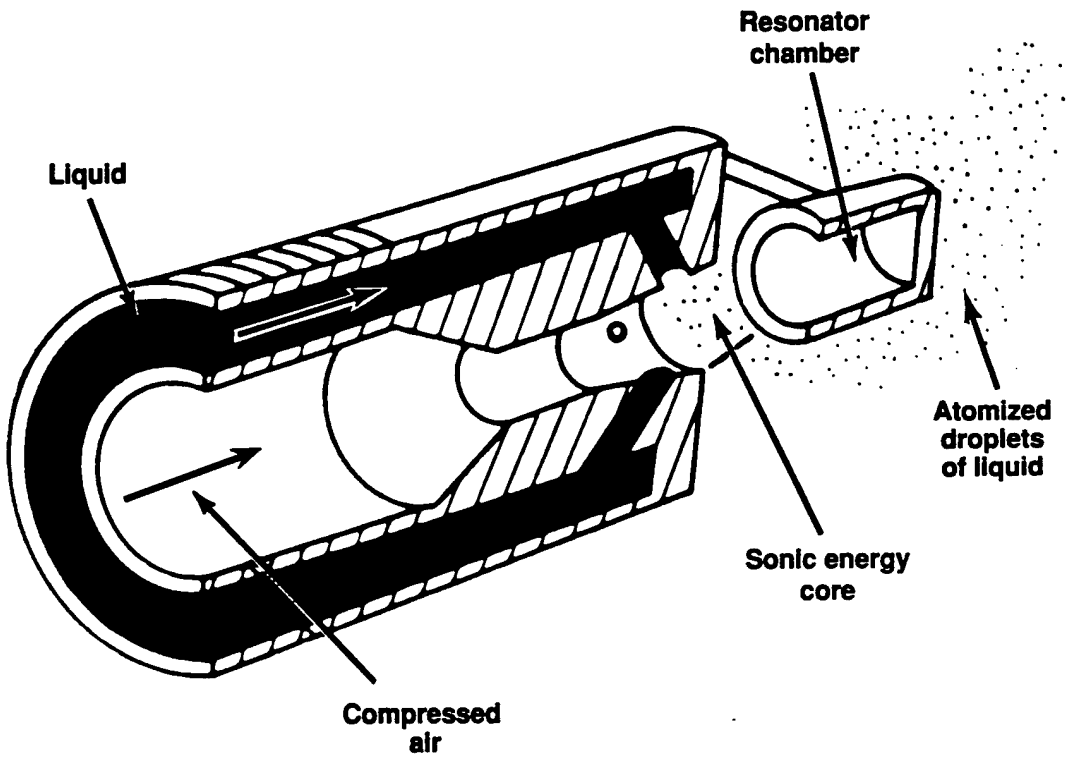

Figure 4-7. Schematic of liquid fuel burner nozzle.

air pressure provided the lowest carbon monoxide and soot levels. The compressed air pressure was set to the maximum available (55 to 60 psig).

4.4.3 Fuel/explosives solution burner. The explosives solution burner supplied with the boiler was custom-designed. The explosives solution was provided from the circulating pump. The flow from the circulating pump was unregulated and typically ranged from 40 to 50 psig. The burner pipe train illustrated in Figure 4-8 comprised:

- A low-pressure oil switch.
- A high-pressure oil switch.
- A viscometer.
- A densimeter.
- A two-way block valve.
- A three-way control valve.

On the solution burner pipe train, the two-way control valve was used to block the flow of solution to the burner, and the three-way valve was used to control the flow of fuel. Initially, the control valve for the flow of solution to the burner also was oversized. The valve stem and seat were replaced with a V-port design. The new design provided improved flow and pressure characteristics.

The solution burner was a modified version of the fuel oil burner. The tips of a normal burner assembly are threaded for ease of replacement and cleaning. A concern was raised that while firing explosives, a buildup of explosives in the threads could lead to an explosion during disassembly; consequently, the slurry burner was welded after assembly.

4.5 Steam vent system. The steam generated by the test boiler was primarily wasted; however, a small portion was used to heat the explosives during solution mixing. The steam from the boiler was piped through a 4-in. insulated pipeline that contained monitors for the steam temperature, pressure, and flow. A flow control valve regulated the rate of steam flow. The discharge from the control valve was directed to a cyclonic steam separator for collection of condensed liquids. The uncondensed steam was directed vertically through a silencer and then discharged into the atmosphere. The liquid discharge was directed to either the boiler feed water tank or to the process drain. During routine operations, the water was directed to the feed water tank. The steam separator and silencer were located on the feed water skid.

A sidestream from the 4-in. steam piping was used for heating the explosives dissolving tanks. A 1-in. insulated steam line was directed through a steam reducing station that consisted of a high-pressure dirt trap, a pressure regulator (15 to 4 psig), a regulator bypass, and a low-pressure dirt trap. The steam-reducing station was located near the boiler system. A dirt and steam trap were provided at the blending system skid also.

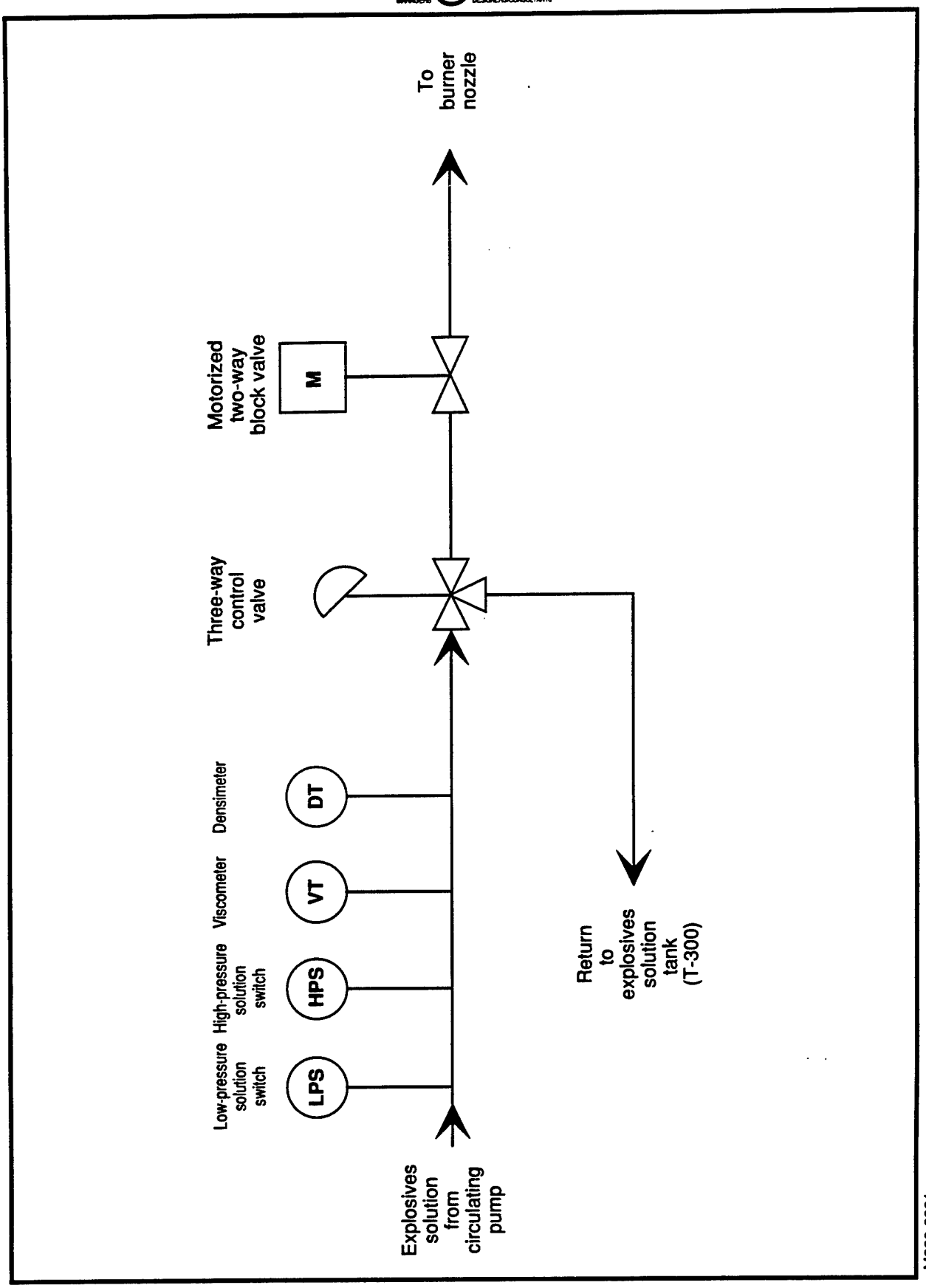

Figure 4-8. Schematic of explosives solution burner pipe train.

4.6 Boiler management system. Control of the boiler and feed system was provided by two control panels located in the Building 117-4 control room. A control panel was supplied by each of the major equipment vendors.

The boiler control panel provided instrumentation for monitoring and recording data from the boiler and boiler feed water system. Flame interlocks and burner management for the boiler were provided by a Honeywell Model BC7000 microcomputer burner control system. Four process controllers were supplied with the boiler control panel. One process controller was a two-loop controller that regulated the steam flow and steam pressure. The other three controllers were single-loop type controllers that regulated fuel oil flow, explosives solution flow, and combustion air flow.

The explosives dissolving and blending system control panel provided instrumentation for monitoring and recording data from the explosive mixing system. Interlocking and sequencing of the explosives solution were provided by a programmable logic controller (PLC). The PLC installed was an Allen Bradley PLC-2. The PLC program was monitored and updated through a digital link to a personal computer.

4.7 Utilities. Operation of the pilot system requires the following utilities:

(a) Electrical power.
(b) Fuel oil.
(c) Propane.
(d) Water.
(e) Compressed air.

4.7.1 Electrical power. The electrical power requirements of the test boiler system and WESTON's testing equipment were supplied by:

- Two 480-v/20-amp breakers.
- Two 120-v/20-amp breakers.

These breakers were connected to existing circuits inside the Building 117-4 control room. Within the boiler and feed system control panels, the power was distributed to the equipment motors and controls.

As a result of the safety analysis, a backup electrical system was installed to provide power in case a plantwide power failure occurred during an explosives testing operation. A 15-kw diesel generator was rented and run continuously during explosives testing operations. The generator was located outside the processing area and was connected to the boiler control panels through a transfer switch located inside the process control room. Loss of power was never experienced; operations using the backup generator were not required.

4.7.2 Fuel oil. HWAAP supplied fuel oil from an existing underground storage tank located in the vicinity of Building 117-4. The fuel oil pump from the existing Building 117-4 incinerators was used to deliver the fuel oil to the boiler system. A portion of the fuel oil was recycled to the storage tank when the boiler was operational to avoid "dead heading" the fuel pump.

4.7.3 Propane. HWAAP supplied propane from an existing underground storage tank located in the vicinity of Building 117-4. The vaporized liquid propane was piped to the existing Building 117-4 incinerators. A 1-in. diameter pipe was installed to connect the propane to the boiler system. The propane consumption was much greater than expected, and the tank had to be refilled once during the test program.

4.7.4 Water. Water for the boiler system was provided by the HWAAP process water system. Water used by the boiler was processed through a rented resin-type water conditioner to remove dissolved solids that would accumulate within the boiler. The conditioned water was directed to the 75-gal feed water tank. The tank was elevated above two feed water pumps (one inline spare). The feed water pumps were each driven by a 0.5-hp motor. The feed water pumps delivered the water under pressure to the boiler. Flow to the boiler was controlled by the level in the boiler steam drum. The feed water tank and pumps were located on a separate skid (see Figure 4-9). The feed water skid was mounted adjacent to the boiler skid.

Initial operations using HWAAP water proved to be troublesome. The long period of inactivity of the Building 117-4 incinerators generated a considerable amount of dirt in the pipelines. Despite precautionary flushing, dirt accumulated in the test equipment. For future operations, the addition of filters on the feed water system is recommended. The boiler was designed for noncontinuous use. To avoid buildup of dissolved solids and salts, blowdown of the mud drum and steam drum was manually performed at the conclusion of each operating day.

4.7.5 Compressed air. Compressed air was provided by the HWAAP air compressor system. A 100-gal air receiver and regulator were installed to provide a steady supply of air to the system. As a result of the system safety analysis, a backup air compressor was recommended in the event of a plant air compressor failure. A 100-cubic feet per minute (cfm), diesel-operated rental unit was operated continuously during explosives testing.

The compressed air from the plant supply and from the backup generator contained moisture that caused operational problems with the air driven equipment. Ice formed in the equipment due to the air's moisture content and low ambient temperature. A refrigerant-type dryer at Building 117-4 was used to dry air used by critical equipment with better success; however, for future operations desiccant-dried air would improve the operation considerably.

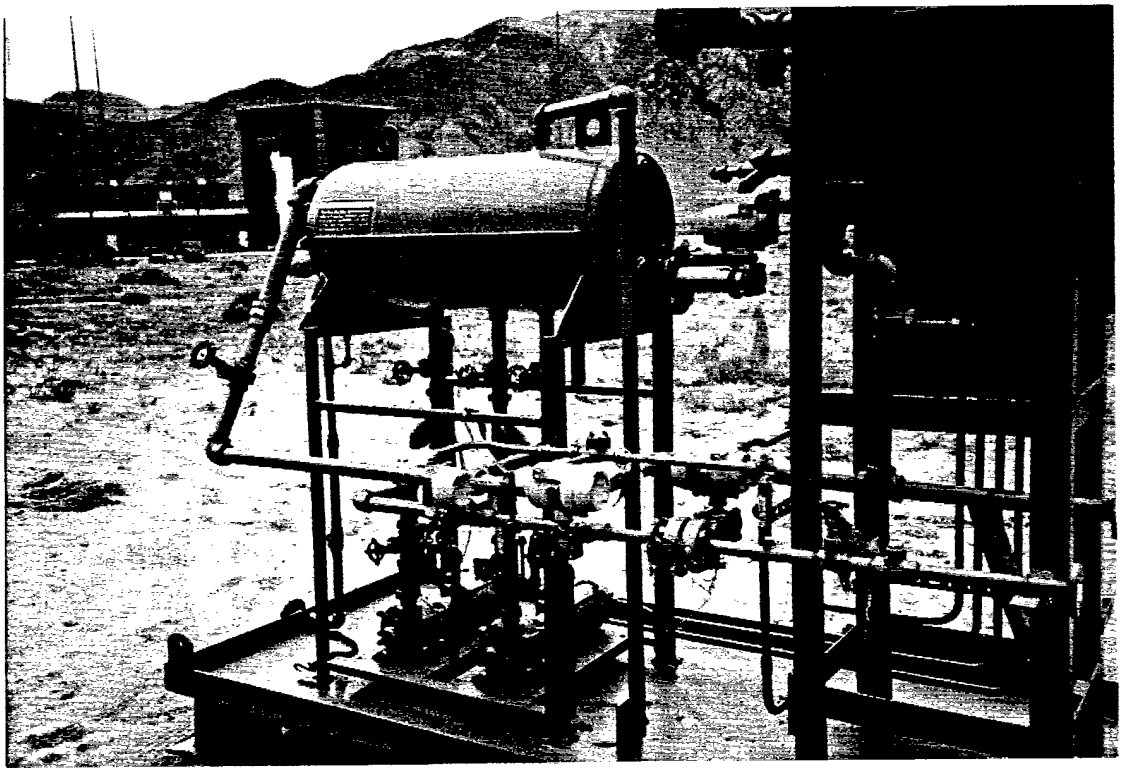

Figure 4-9. Boiler feed water skid prior to installation of insulation.

5. TEST SCHEDULE

Phase I of the supplemental fuel project began in December 1988 and was completed in December 1990. Phase I consisted of a number of major tasks, including:

- Development of project plans.
- Design of boiler system.
- Design of feed preparation system.
- Safety plan preparation and reviews.
- Manufacture of the test equipment.
- Installation of test equipment.
- Shakedown and preliminary testing.
- System operation and testing.
- System shutdown.

The project schedule is shown in Figure 5-1. Each of the major activities is shown with the start and completion dates. The equipment used on the project, as described in Section 4, was specially selected based on compatibility with the solvents and explosives and for use in an explosive environment. The delivery of materials and parts was often much longer than expected because of these conditions.

On 21 October 1990 testing began. The remainder of this section describes the details of the test sequences and operating procedures used during testing.

5.1 Planned test sequences. The test plan described 18 test runs that were to be completed during the pilot test. These test runs were designed in three test sequences. Each test sequence was distinguished by the type of fuel processed: Test Sequence I -- fuel oil only, Test Sequence II -- TNT solution, and Test Sequence III -- Composition B slurry. Within each test sequence, a matrix of explosives concentrations and excess air percentages were to be tested. The tests were to be completed sequentially, with one test sequence following another. The order of test runs to be completed within a test sequence was based on random selection. The tests were identified by T-#, where # indicated the order of the test (i.e., T-2 was to be the second test). Figure 5-2 contains a summary of the planned tests and sequences.

5.2 Actual test sequences. Testing began for the project on 21 October 1990 and was completed on 2 December 1990. During this period, five tests were completed. The tests and operational problems encountered during each test are described in this section. Test runs that were not completed during Phase I will be completed during future phases.

5.2.1 Test Sequence I. Test Sequence I (Tests T-1, T-2, and T-3) was completed in its entirety. The testing began with T-1 on 21 October 1990. Although Test Sequence I was to be completed without explosives, to provide a consistent background of data involving the boiler and explosives solution burner nozzle, the fuel oil was delivered for Test Sequence I through the explosives

Task Description	Start-Finish Dates	Jan. 1989	Mar. 1989	May 1989	July 1989	Sep. 1989	Nov. 1989	Jan. 1990	Mar. 1990	May 1990	July 1990	Sep. 1990	Nov. 1990	Jan. 1991
Prepare Project Plans	26 Jan. 1989-17 May 1989													
Design Boiler System	6 May 1989-1 Dec. 1989													
Design Feed System	18 Sep. 1989-1 Jan. 1990													
Safety Plan Reviews	1 Jan. 1990-15 Aug. 1990													
Equipment Manufacturing	18 Jan. 1990-15 Aug. 1990													
System Installation	25 Jun. 1990-22 Aug. 1990													
System Shakedown	2 Aug. 1990-21 Oct. 1990													
Testing	21 Oct. 1990-2 Dec. 1990													
System Shutdown	2 Dec. 1990-7 Dec. 1990													

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Figure 5-1. Overall project schedule.

Test Sequence I

- Fuel oil feed
- Various excess air concentrations (20%, 25%, 30%)

% excess air	
20	T-1
25	T-2
30	T-3

Test Sequence II

- Fuel oil/solvent/TNT feed
- Various excess air concentrations

% excess air	Weight % explosives in feed: 1	10	15
20	T-10	T-7	T-9
25	T-12	(T-18)* T-11	T-8
30	T-5	T-6	T-4

Test Sequence III

- Fuel oil/solvent/Comp B feed
- Various excess air concentrations

% excess air	Weight % explosives in feed: 1	4	8
20	T-16		T-14
25		T-17	
30	T-13		T-15

*T-18 was a repeatability test.

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Figure 5-2. Originally planned test sequences.

dissolving and blending system. Test T-1 was the first occasion for the explosives dissolving system to be used for firing the boiler. A number of difficulties were encountered with the flow meter, burner nozzle, and ability to fire acetone without supplementing it with fuel oil. As a result of the difficulties, Test T-1 was repeated twice; each test is designated as T-1a, T-1b, and T-1c. The dates each test were completed are provided in Table 5-1.

5.2.2 Test Sequence II. Because of the difficulties in Test Sequence I with monitoring the flow of explosives solution to the burner, an alteration was made to Test Sequence II. The project plan, as shown in Figure 5-2, called for Test T-4 (a 15% TNT case) to be the first test involving TNT. Because of the high TNT concentration, Test T-4 was delayed, and Test T-5 (a 1% TNT test) was the first test completed in Test Sequence II.

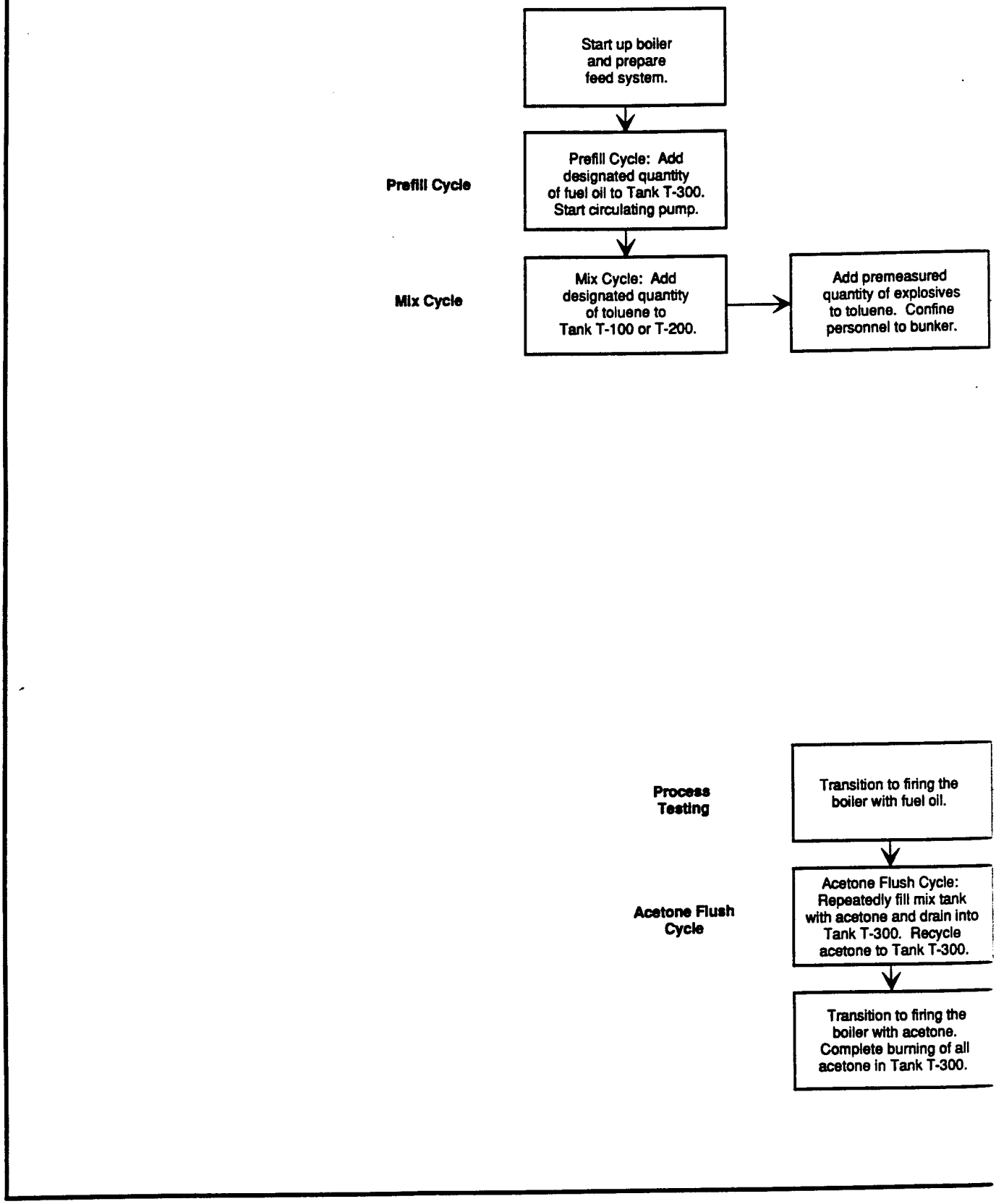
Difficulties were encountered when executing Test T-5 (see Subsection 5.2.2.1), and the scope of testing was reduced to include one more test. Test T-9, a 15% TNT solution fired with 20% excess air, was chosen because, as the single remaining test, it was expected to produce worst-case NO_x emissions.

5.2.2.1 Test T-5. The procedures for preparing the TNT and explosives solution were followed per the standard operating procedures developed during the design phase. Figure 5-3 provides the sequence of steps used in adding, mixing, and heating the explosives-laden solution. Continuous firing of the explosives was achieved for 29 min before a flameout of the boiler occurred. The flameout occurred because of problems with the circulating pump. Continuous flow and pressure from the circulating pump could not be ensured for the remainder of the test. To complete the operation, the solution was fired simultaneously with the fuel oil burner. The stack emissions testing was completed during the cofiring.

5.2.2.2 Test T-9. This test began on 17 November 1990 and followed the explosives mixing procedures as outlined in Figure 5-3. A portion of the TNT did not dissolve, however, and remained in crystalline form in the dissolving tank (Tank T-200). The opening of the drain valve on Tank T-200 caused the mass of solids to drain into Tank T-300. The crystalline TNT subsequently plugged the inlet to the circulating pump. As a result, it was necessary to disassemble the piping and manually remove the solid TNT. The plug was cleaned on 18 and 19 November 1990. The explosives slurry was circulated back into Tanks T-100 and T-200. The solution was then diluted with additional toluene and acetone. A portion of the diluted mixture was fired on 19 November 1990. Because of a pump failure, firing of the solution was halted temporarily. The burning of the solution was resumed on 29 and 30 November 1990. For these tests, the solution was also diluted with acetone and toluene. The firing of the diluted T-9 test solution is designated as T-9a, T-9b, and T-9c. Because of the extended length and multiple problems with the execution of Test T-9, stack emissions for particulate matter and TNT could not be completed. The remainder of tests in the test plan will be completed in the second phase of tests.

Table 5-1. Operating conditions for completed test runs.

Test Number	Test Date	Target Explosives Concentration (%)	Target Excess Air Rate (%)
1a	22 October 1990	0	20
1b	27 October 1990	0	20
1c	30 October 1990	0	20
2	23 October 1990	0	25
3	25 October 1990	0	30
5	31 October 1990	1	30
9a	19 November 1990	15	20
9b	29 November 1990	15	20
9c	30 November 1990	15	20


Start up boiler and prepare feed system.
Prefill Cycle
Prefill Cycle: Add designated quantity of fuel oil to Tank T-300. Start circulating pump.
Mix Cycle
Mix Cycle: Add designated quantity of toluene to Tank T-100 or T-200.
Add premeasured quantity of explosives to toluene. Confine personnel to bunker.
Process Testing
Transition to firing the boiler with fuel oil.
Acetone Flush Cycle
Acetone Flush Cycle: Repeatedly fill mix tank with acetone and drain into Tank T-300. Recycle acetone to Tank T-300.
Transition to firing the boiler with acetone. Complete burning of all acetone in Tank T-300.

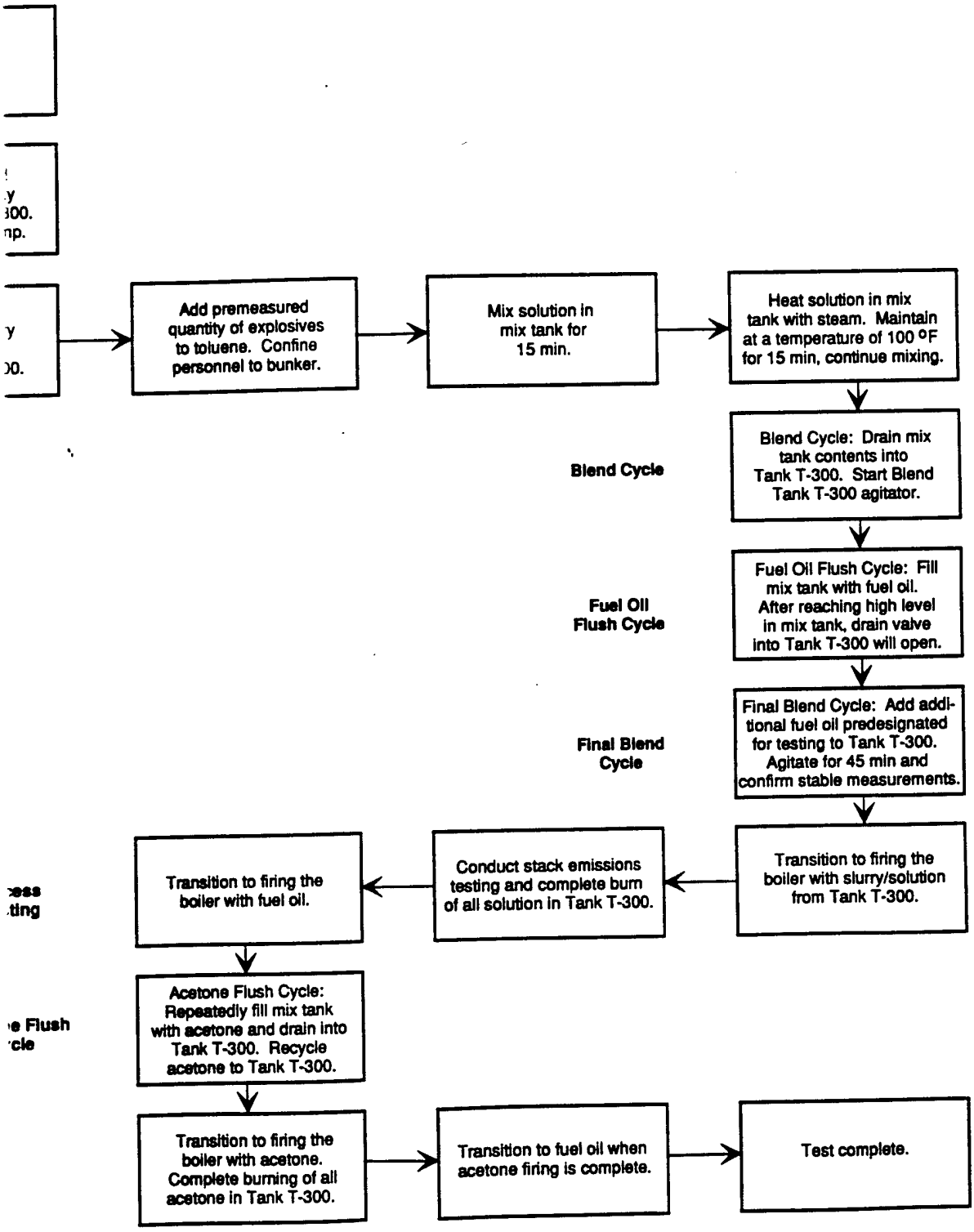


Figure 5-3. Solution p

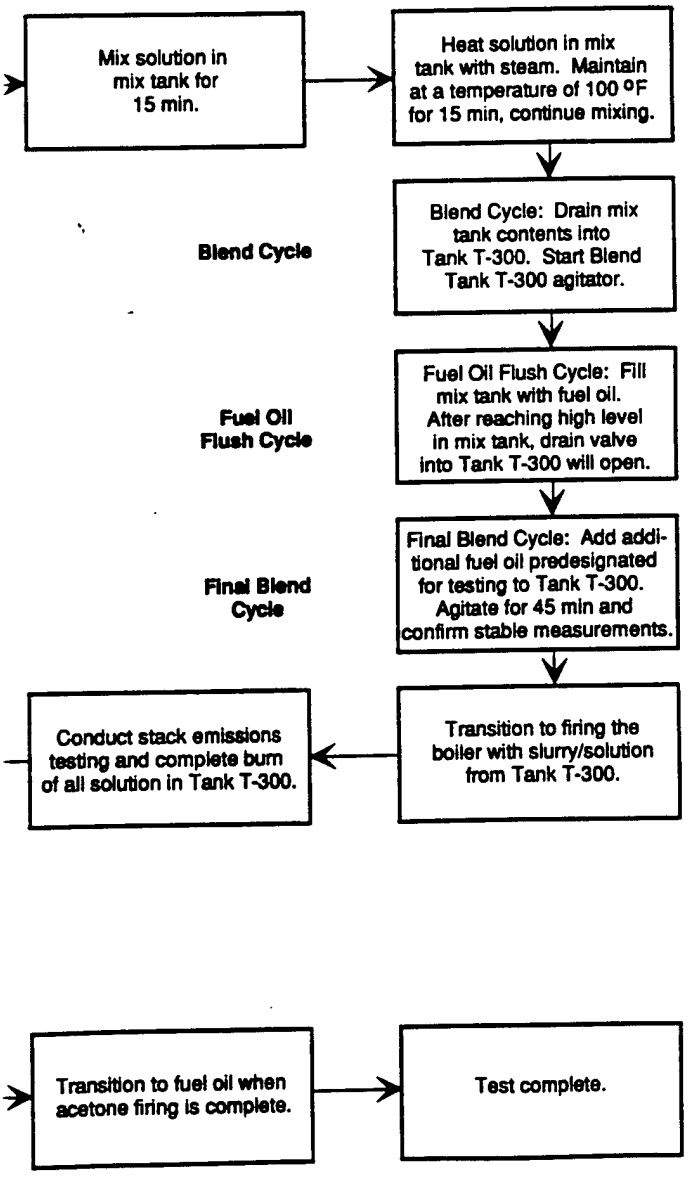


Figure 5-3. Solution preparation procedures.

6. TEST VARIABLES

The variables of the pilot test can be classified as follows:

(a) Independent variables--those whose values were not affected by test operations. No attempts were made to modify or control independent variables.

(b) Control variables--those whose values were selected and maintained during test operations.

(c) Response variables--those whose values were a function of the selected operating conditions.

Table 6-1 provides a summary of test variables associated with the pilot test.

6.1 Independent variables. As shown in Table 6-1, there were five independent variables associated with the pilot study system. These independent variables were:

- Ambient air temperature.
- Ambient air moisture content.
- Ambient air pressure.
- Fuel oil composition.
- Boiler feed water temperature.

6.1.1 Ambient air temperature. The temperature of the ambient (inlet) air varied with local weather conditions, time of day, etc. The ambient air temperature was monitored during each test run.

6.1.2 Ambient air moisture content. The moisture content of the ambient air varied with local weather conditions, time of day, etc. The site was located in the desert; little variation was expected. Site personnel were restricted to the Command Center for safety purposes; therefore, it was not possible to monitor moisture content on a routine basis. Moisture content was monitored before and after each test run.

6.1.3 Ambient air pressure. The pressure of the ambient air (atmospheric pressure) varied with local weather conditions, time of day, etc. The ambient air pressure was monitored before and after each test run involving stack sampling.

6.1.4 Fuel oil composition/physical properties. The composition (percentage of ash, sulfur, nitrogen, hydrogen, carbon, and oxygen) and physical properties (heating value, viscosity, specific gravity) of the fuel oil depended on the source from which the fuel oil was purchased. Composition and physical properties were determined via laboratory analyses. A grab sample was collected from the fuel oil storage tank prior to the first test.

Table 6-1. Summary of test variables for the pilot study.

A. Independent Variables

- Ambient air conditions.
  - Temperature.
  - Moisture content.
  - Pressure.
- Fuel oil.
  - Composition.
  - Physical properties.
- Boiler feed water temperature.

B. Control Variables

Held Constant at All Levels

- Energetic solution preparation.
- Temperature of fuel/explosives feed.
- Steam flow rate from boiler.
- Steam pressure (fuel/explosives flow rate).

Held Constant at Various Levels

- Explosive type.
- Explosive concentration in feed solution.
- Percentage of excess combustion air.

C. Response Variables Measured

- Fuel/explosives stream to boiler.
  - Volumetric flow rate.
  - Viscosity.
  - Density.
  - Pressure.
- Boiler feed water volumetric flow rate.
- Boiler efficiency.

Table 6-1
(continued)

- Exhaust gas.
  - Temperature.
  - Flow rate.
  - Composition (oxygen, carbon dioxide, carbon monoxide, explosives, NO_x, particulate, and moisture content).
- Steam temperature.
- DRE of the system.

6.1.5 Boiler feed water temperature. Water for the boiler was provided by the HWAAP process water system and the recycled water from the steam condensing system. The temperature of the water was monitored constantly during operations.

6.2 Control variables.

6.2.1 Control variables held constant at all levels. Four test variables were maintained for each test run (energetic solution preparation, temperature of fuel/explosives feed, steam flow rate, and steam pressure), as shown in Table 6-1.

6.2.2 Energetic solution preparation. Procedures to prepare the boiler feed solution were to be maintained constant for each test run. Procedures include the following items:

(a) Chronological order for mixing components (toluene added to explosives, explosives/solvent solution added to fuel).

(b) Solvent to explosives mass ratio [2.2:1 (toluene to explosives) on a weight basis].

(c) Conditions for explosives dissolution (temperature of 100°F, mix time of 0.5 hr).

(d) Conditions for fuel/explosives mixing [minimum of 0.5 hr of recycling until temperature stabilizes (±1°F)].

The mixing procedures were followed for the two completed explosives tests. The solution preparation steps were inadequate for the Test T-9 conditions. Test T-9 was completed using a high mass ratio of TNT in solvent (15% of final solution weight). The difficulties with the solution preparation are described in the test results section.

6.2.3 Temperature of fuel/explosives feed. The fuel/explosives feed stream was not fed to the boiler until the temperature stabilized to constant conditions. After the explosives/solvent mixture was added to the fuel oil in the fuel/explosives blending tank, the mixture was circulated for a minimum of 45 min. When the temperature was constant (±1°F), the fuel/explosives stream was fed to the boiler.

6.2.4 Steam flow rate from boiler. The steam flow rate from the boiler was maintained to simulate 100% steam demand on the boilers. The flow rate was maintained constant by a flow control valve simulating a process load on the boiler.

6.2.5 Steam pressure. During the conceptual design of the process, the steam was to be maintained at a constant pressure during each test run. The mass flow rate of the fuel/explosives solution was to be varied to maintain the desired pressure. Actual conditions proved that the burner did not exhibit sufficient

control to maintain a constant steam pressure. Therefore, the automatic controller was run in manual mode. The fuel flow rate was set to a fixed rate during testing.

6.2.6 Control variables held constant at various levels. As shown in Table 6-1, there were three control variables held constant at various levels. These variables were the explosive type, the explosive concentration in feed solution, and the percentage of excess combustion air.

6.2.7 Explosive type. Two explosives were to be evaluated during the pilot test: TNT and Comp B (60% TNT and 40% RDX). These explosive compounds were selected because of their predominance in waste energetic materials. Virgin explosives (raw materials used in the manufacture of munitions) were supplied by HWAAP. Only TNT was tested in this phase.

6.2.8 Explosives concentration in feed solution. The explosives concentrations to be evaluated during the pilot test included 1%, 10%, and 15% (by weight) of TNT. Because of time constraints, the concentration of TNT was evaluated for the test conditions of 1% and 15% only. The 15% explosives concentration, when coupled with the ambient temperatures and selected solvent concentrations, proved to be excessive. All the TNT did not dissolve, and some recrystallization may have occurred after the solution cooled. Test T-9 was modified to reduce the explosives concentration through dilution with solvents. The actual explosives concentration, which was fired during the three different parts of Test T-9, could only be estimated by the dilution records. A sample of the solution was collected and analyzed to estimate the concentration of the test solution prior to the third burn (Test T-9c).

6.2.9 Percent of excess combustion air. The percentages of excess combustion air evaluated during pilot test activities included 20%, 25%, and 30%. These values were selected based on the design rating of excess air for the boiler system (32%). To maintain a constant amount of excess air, a ratio controller was used. The ratio controller utilized actual fuel flow rate measurements to adjust the combustion air flow rate set point. The fuel oil to air ratio was maintained for the three nonexplosives tests as planned. The difficulty in maintaining a constant flow of explosives solution and measurement of the solution flow rate necessitated manual control. During explosives tests, excess air was maintained at the lowest possible level that could be used while achieving good combustion characteristics. The minimum excess combustion air level typically fell within 20% to 30% during the explosives tests.

6.3 Response variables measured. There were numerous response variables associated with the pilot system. Eleven response variables were measured in order to fulfill the objectives of the pilot study, as shown in Table 6-1.

6.3.1 Volumetric flow rate of fuel/explosives solution. A major portion of the fuel/explosives discharge flow from the circulating fuel pump was recycled to the fuel/explosives blending tank (Tank T-300) to facilitate mixing and suspension of solids. The flow rate was measured to determine small fluctuations in flow in the burner feed and in the recycling stream from the boiler.

6.3.2 Viscosity of fuel/explosives solution. The viscosity of the fuel/explosives solution was expected to vary based on selected test conditions (i.e., explosives concentration). Viscosity was expected to serve as an indicator to ensure the homogeneity of the solution. Viscosity was measured continuously by a monitor located in the boiler feed piping.

6.3.3 Density of fuel/explosives solution. The density of the fuel/explosives solution varied with test conditions (i.e., explosives concentration). Density served as an indicator of solution homogeneity. Density was measured continuously by a monitor at the boiler as percent solids and by a monitor at the inlet to the recycling tank (T-300) as specific gravity.

6.3.4 Pressure of fuel/explosives solution. The pressure of the discharge from the circulating fuel pump and the boiler feed was monitored to detect fluctuations during operation. The pressure was monitored every 15 min by the system operator.

6.3.5 Boiler feed water volumetric flow rate. The volumetric flow rate of boiler feed water was expected to equal the steam flow rate. The boiler feed water flow rate provided independent confirmation of the steam flow rate. The flow rate was monitored continuously by a flow sensor.

6.3.6 Boiler efficiency. Boiler efficiency is defined as follows:

$$\text{Boiler efficiency} = \frac{\text{Heat Absorbed by Water}}{\text{Heat Supplied by Fuel}}$$

Boiler efficiency was calculated from energy and material balance calculations.

6.3.7 Exhaust gas temperature. The temperature of the exhaust gases in the boiler stack was monitored to assist in the completion of mass and energy balances. The temperature was monitored continuously.

6.3.8 Exhaust gas flow rate. The flow rate of the exhaust gases is dependent on the mass of combustion air being introduced and the composition of the fuel/explosives feed stream. The flow rate was monitored during each of the stack tests.

6.3.9 Composition of exhaust gases. The composition of gases in the boiler exhaust stream was monitored to determine the types

and quantities of compounds present, including oxygen (O_2), carbon dioxide (CO_2), carbon monoxide (CO), explosives, NO_x, particulate matter, and moisture content. The explosives, particulate, and moisture content were monitored during the stack tests. The gas composition was monitored continuously.

6.3.10 Steam temperature. The steam temperature varied with steam pressure and atmospheric conditions. The steam temperature provided independent confirmation of steam pressure. The steam temperature was monitored continuously.

6.3.11 DRE of the system. The destruction and removal efficiency was calculated for TNT as follows:

$$DRE = \frac{C_1 - C_2}{C_1} \times 100$$

Where:

DRE = Boiler system TNT destruction and removal efficiency (expressed as a percent).

C_1 = Mass of TNT per unit time entering the boiler (fuel/explosives feed stream).

C_2 = Mass of TNT explosives solution per unit time discharging from the boiler system (stack).

7. SAMPLING AND ANALYTICAL METHODS

Samples of the fuel oil, stack emissions, and explosives solution were collected by WESTON personnel. Samples of stack emissions and explosives solution were sent to the WESTON Analytics Division Laboratory in Lionville, PA. Samples of fuel oil were analyzed by Schwarzkopf Microanalytical Laboratory.

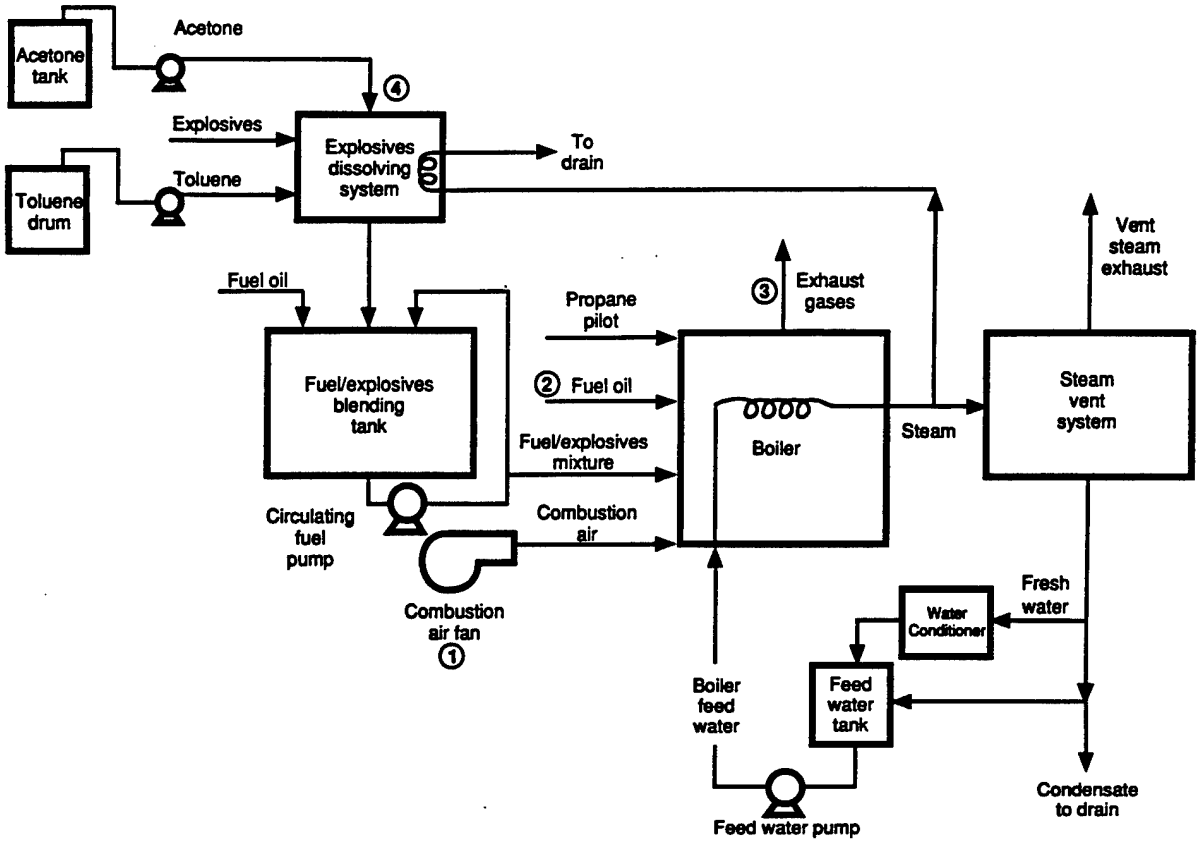
The locations of the sampling points are shown in Figure 7-1. A summary of the parameters monitored for each test run is provided. Unless otherwise noted, samples were discrete samples (i.e., grab samples). A brief discussion of the sampling and analysis methodology for each point is included in the following subsections.

7.1 Ambient air (sample point 1 in Figure 7-1). Inlet air to the combustion air blower (ambient air) was sampled to determine the moisture content, temperature, and pressure. The sampling and analysis plan for ambient air is summarized in Table 7-1. To determine moisture content, a sling psychrometer was used to measure the wet bulb and dry bulb temperatures. The measured temperatures and a psychometric chart were used to determine the ambient air moisture content. The temperatures were monitored before and after each test run. Since project personnel were restricted to the Command Center for safety purposes, it was not possible to test moisture content more frequently. Atmospheric pressure was monitored using a barometer. Readings were recorded before and after each test run.

The test plan called for measurement of the combustion air inlet flow rate for Tests T-1 through T-3. The physical configuration of the combustion air fan inlet, however, did not allow for measurement of air flow as planned. To provide an air flow measurement, a continuous flow meter was installed on the combustion air fan as described in Subsection 8.1.1. Calibration of the air flow meter was accomplished by conducting flow measurements at the fan discharge. The most accessible location for discharge testing was in the stack exhaust. This testing was completed before test operations began and is designated as Test T-0.

7.2 Fuel oil (sample point 2 in Figure 7-1). Fuel oil was sampled prior to the first test run to determine its composition and physical properties. Fuel oil was taken from the underground storage tank used during all of the test runs. During testing, the fuel oil tank was not refilled. A summary of the sampling and analysis plan for the fuel oil is contained in Table 7-2.

The fuel oil was sampled from the existing underground storage tank located in proximity to Building 117-4. The tank sample port (for depth measurement) was used to access the tank. A 500-ml composite liquid waste sampler (Coliwasa) was used to collect the oil sample from top, bottom, and middle of the storage tank. The sample was composited on-site prior to shipment for analysis.



Parameters Sampled/Analyzed	1 Combustion Air Blower Inlet Gases	2 Startup Fuel	3 Exhaust Gases	4 Explosives Dissolving Tank
TNT			T-5	T-9
Volatile Organics				T-9
Total Hydrocarbons*			All Tests	
Carbon Dioxide*			All Tests	
Carbon Monoxide*			All Tests	
Oxygen*			All Tests	
Nitrous Oxide*			All Tests	
Particulates			T-1 to T-3, T-5	
Volumetric Flow Rate			T-0 to T-3, T-5	
Temperature	T-1 to T-3, T-5		T-1 to T-3, T-5	
Moisture Content	T-1 to T-3, T-5			
Atmospheric Pressure	T-1 to T-3, T-5			
Heating Value		T-0		
Ash Content		T-0		
Sulfur		T-0		
Nitrogen		T-0		
Hydrogen		T-0		
Carbon		T-0		
Oxygen		T-0		
Specific Gravity		T-0		

* CEM sample.

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Figure 7-1. Locations of sampling points.

Sampling Point Number	1		
Description:	Combustion Air Blower Inlet Gases		
Test Objective:	Determine Temperature and Air Flow Rate		
Sampling Objective:	Collect a Representative Sample		
Parameters to be Tested:	Moisture Content	Temperature	Atmospheric Pressure
Test Runs Sampled:	T-1 to T-3,T-5	T-1 to T-3,T-5	T-1 to T-3,T-5
Detection Limit:	N/A	N/A	N/A
Sampling or Monitoring Method:	Sling Psychrometer	Sling Psychrometer	Barometer
Sampling Extraction/Analysis Method(s):	N/A	N/A	N/A
Sampling or Monitoring Design:			
• Total Number of Samples Collected	8 (Before and After Each Test)	8 (Before and After Each Test)	8 (Before and After Each Test)
• Field Blanks	N/A	N/A	N/A
• Trip Blanks	N/A	N/A	N/A
• Method Blanks	N/A	N/A	N/A
• Blank Spikes	N/A	N/A	N/A
• Blank Spike Duplicates	N/A	N/A	N/A
• Number of Sample Replicates	N/A	N/A	N/A
• Total Number of Samples Analyzed	8	8	8
N/A = Not applicable.			
T = Test run.			
134-593c			

Table 7-1. Sampling and analysis plan for combustion air blower inlet gases (ambient air).

Sampling Point Number:	2							
Description:	Fuel Oil							
Test Objective:	Determine the Composition and Physical Properties of the Fuel Oil							
Sampling Objective:	Collect a Representative Sample							
Parameters to be Tested:	Heating Value	Ash Content	Sulfur	Nitrogen	Hydrogen	Carbon	Oxygen	Specific Gravity
Test Runs Sampled:	T-0	T-0	T-0	T-0	T-0	T-0	T-0	T-0
Detection Limit:	50 Btu/lb	0.01%	0.05%	0.05%	1.0%	1.0%	N/A	0.01% API
Sampling or Monitoring Method:	500 mL Collected in Glass Bottle from Fuel Oil Tank	500 mL Collected in Glass Bottle from Fuel Oil Tank	500 mL Collected in Glass Bottle from Fuel Oil Tank	500 mL Collected in Glass Bottle from Fuel Oil Tank	500 mL Collected in Glass Bottle from Fuel Oil Tank	500 mL Collected in Glass Bottle from Fuel Oil Tank	N/A	500 mL Collected in Glass Bottle from Fuel Oil Tank
Sample Extraction/Analysis Method(s):	ASTM D240	ASTM D482	ASTM D129	ASTM D3228	ASTM D3178	ASTM D3178	Calculated by Difference in Elemental Analysis	ASTM D1298
Sampling or Monitoring Design:								
• Total Number of Samples Collected	1	1	1	1	1	1	1	1
- Field Blanks	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
- Trip Blanks	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
- Method Blanks	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
- Blank Spikes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
- Blank Spike Duplicates	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
- Number of Sample Replicates	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
• Total Number of Samples Analyzed	1	1	1	1	1	1	1	1

N/A = Not applicable.
T = Test run.

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Table 7-2. Sampling and analysis plan for fuel oil.

Analysis of the fuel oil samples was completed per the test plan with the exception of the sulfur analysis. Sulfur was determined using ASTM Method D 129 "Standard Test Method for Sulfur in Petroleum Products (General Bomb Method)," which is provided in Appendix A. This method was found to be more appropriate than the planned ASTM Method D 4239.

A replicate sample of fuel oil was collected in the event that damage to the original sample occurred during shipment and handling. No damage occurred, and all results appeared consistent with number 2 fuel oil; therefore, the replicate was not analyzed.

7.3 Exhaust gases (sample point 3 in Figure 7-1). The exhaust gases from the 12-in. inner diameter boiler stack were sampled to determine the composition and gas flow rate. A summary of the sampling and analysis plan for the exhaust gases is shown in Table 7-3.

7.3.1 Particulate sampling equipment. Particulates were collected using an EPA Method 5 sampling train. The Method 5 sampling train consisted of the following components:

- A 316 stainless steel nozzle with an inner diameter sized to sample isokinetically.
- A heated, borosilicate-lined probe, equipped with a thermocouple to measure flue gas temperature and an S-type pitot tube to measure flue gas velocity pressure.
- A heated oven containing a borosilicate filter holder with a 90-mm Reeve Angel 934 AH glass fiber filter.
- An impinger train containing four impingers:
  - 100 mL of distilled water.
  - 100 mL of distilled water.
  - Dry.
  - 300 g of silica gel.
- During testing, a refrigerated coolant recirculating system was used to maintain the particulate test train impingers below the method-required temperature limitations.
- A vacuum hose to connect the outlet of the impinger train to the control module.
- A control module containing a 3-cfm carbon vane vacuum pump (sample gas mover), a calibrated dry gas meter (sample gas volume measurement device), a calibrated orifice (sample gas flow rate monitor), and inclined manometers (orifice and gas stream pressure indicators).

Sampling Point Number:	3								
Description:	Exhaust Gases								
Test Objective:	Determine the Composition and Flow Rate Discharging the Boiler								
Sampling Objective:	Collect a Representative Sample								
Parameters to be Tested:	TNT	Total Hydro-carbons	Carbon Dioxide	Carbon Monoxide	Oxygen	Nitrous Oxides	Particu-lates	Moisture Content	Volumetric Flow Rate
Test Runs Sampled:	T-5	All	All	All	All	All	T-1 to T-3,T-5	T-1 to T-3,T-5	T-1 to T-3,T-5
Detection Limit:	2ug/Train	1 ppm	0.1%	10 ppm	0.1%	1 ppm	0.1 mg Per Sample	0.1%	N/A
Sampling or Monitoring Method:	EPA Modified Method 5	EPA Method 25A	EPA Method 3A	EPA Method 10	EPA Method 3A	EPA Method 7E	EPA Method 5	EPA Method 5 and Modified Method 5	EPA Modified Methods 1, 2
Sample Extraction/Analysis Method(s):	EPA Modified Method 5 HPLC	Flame Ionization Detector	Infrared Absorption	Infrared Absorption	Electro-chemical Cell	Chemilumi-nescent Reaction	Gravimetric	N/A	N/A
Sampling or Monitoring Design:									
• Total Number of Samples Collected	1	9	18	18	18	18	6	6	6
- Field Blanks	1	N/A	N/A	N/A	N/A	N/A	1	N/A	N/A
- Trip Blanks	1 Per Sample Shipment	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
- Method Blanks	1 Per Analytical Batch[a]	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
- Blank Spikes	1 Per Analytical Batch	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
- Blank Spike Duplicates	1 Per Analytical Batch	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
- Number of Sample Replicates	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
• Total Number of Samples Analyzed	2	9	9	9	9	9	6	6	6

N/A = Not applicable. T = Test run.
ppm = Parts per million.
HPLC = High-performance liquid chromatography.
[a]Batch is a minimum of 20 samples.

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Table 7-3. Sampling and analysis plan for exhaust gases.

The control module was located in the Building 117-4 control room.

- A switchable, calibrated, digital pyrometer to monitor flue and sample gas temperatures.

A schematic of the sampling train is shown in Figure 7-2.

7.3.2 Explosives sampling equipment. TNT and RDX were collected using an EPA Modified Method 5 sampling train. Samples were analyzed using high-performance liquid chromatography (HPLC) procedures. The EPA Modified Method 5 sampling train consisted of the following components:

- A 316 stainless steel nozzle with an inner diameter sized to sample isokinetically.
- A heated, borosilicate-lined probe, equipped with a thermocouple to measure flue gas temperature and an S-type pitot tube to measure flue gas velocity pressure.
- A heated oven containing a borosilicate filter holder with a Pallflex® 2500 QAT-UP 90-mm quartz fiber filter. A thermocouple was inserted in the filter box chamber.
- An impinger train consisting of a Grahm- (spiral-) type ice water-cooled condenser, two ice water-jacketed sorbent modules each containing approximately 40 g of 30/60 mesh XAD-2 (pre-extracted), temperature sensors (thermocouples), a 1-L condensate trap, two standard Greenburg-Smith impingers each containing 100 mL of distilled water, and a final impinger containing 300 g of dry, preweighed silica gel plus a thermocouple to measure sample gas exit temperature.
- During testing, a refrigerated coolant recirculating system was used to maintain the explosives test train impingers and XAD-2 resin condensers below the method-required temperature limitations.
- A vacuum line (umbilical cord) to connect the outlet of the impinger train to a control module.
- A control module containing a 3-cfm carbon vane vacuum pump (sample gas mover), a calibrated dry gas meter (sample gas volume measurement device), a calibrated orifice (sample gas flow rate monitor), and inclined manometers (orifice and gas stream pressure indicators). The control module was located in the Building 117-4 control room.
- A switchable, calibrated, digital pyrometer to monitor flue and sample gas temperatures.

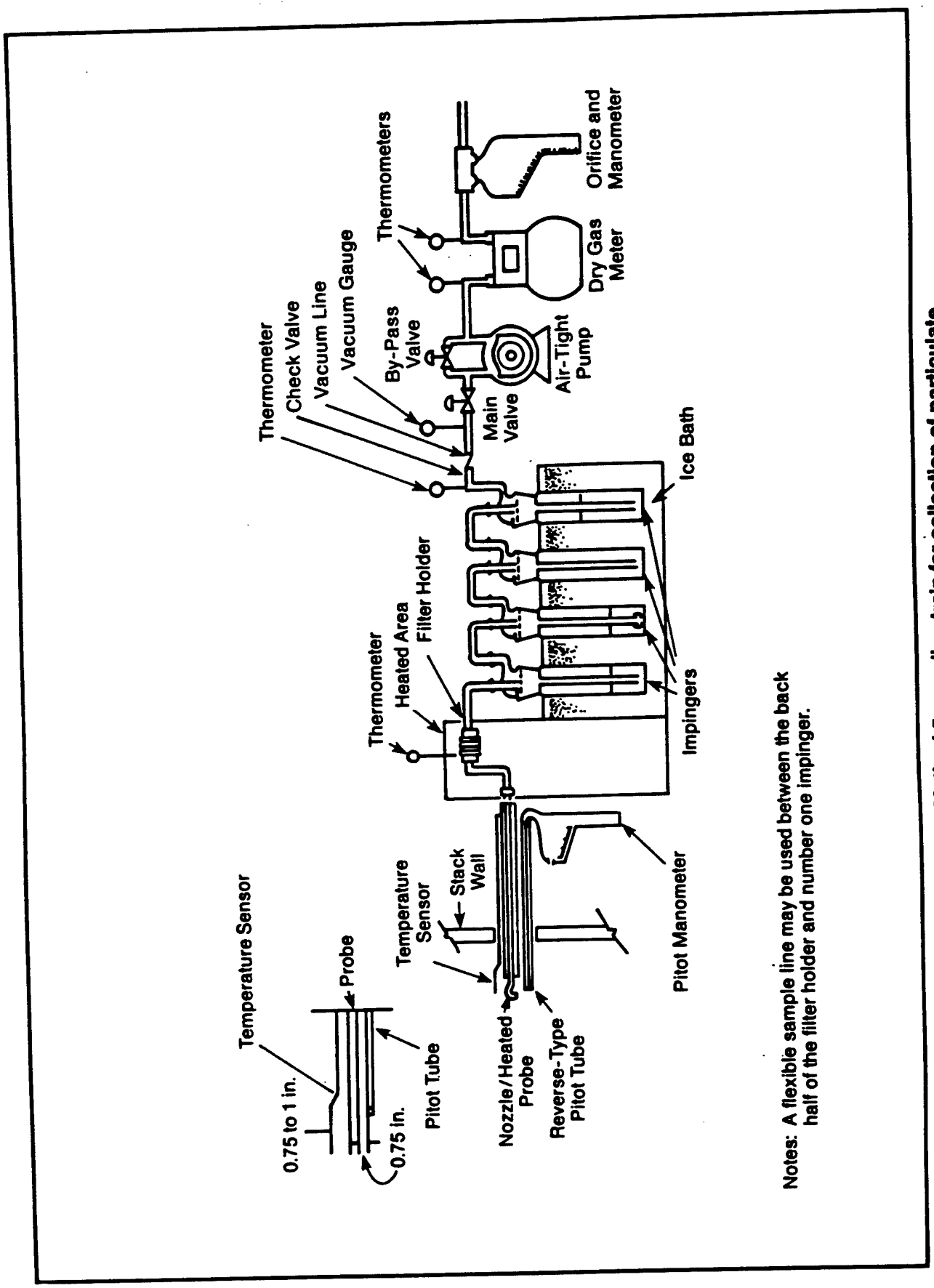


Figure 7-2. EPA Method 5 sampling train for collection of particulate.

A schematic of the Modified Method 5 sampling train for the exhaust gases is shown in Figure 7-3.

7.3.3 Sampling procedures. A separate test port was utilized for each train. The Modified Method 5 test train probe was located in the lower test port. The Method 5 test train probe was located in the upper test port. The lower sampling port was located 8 ft below the upper particulate sampling port and offset by 90 degrees (see Figure 7-4). A total of four traverse points on a single axis across the stack diameter were sampled for each test run. Prior to the start of testing, the Modified Method 5 and Method 5 test train sampling probes were external to the stack. A final check of all equipment functions was made at this time.

After reaching stable operating conditions with TNT-spiked fuel oil, the explosives and particulate sampling runs were begun. The test personnel were restricted to the Command Center. An automated sampling train positioning device was operated remotely from the Command Center. The positioning device moved the sampling probes into the stack at the appropriate traverse point locations. The test ports were sealed with a cover plate held in position by a spring to avoid leakage.

The particulate samples were collected during 60- or 80-min test runs, with 15 or 20 min of sampling time per traverse point. The explosives sample was collected in an 80-min test run, with 20 min of sampling time per traverse point. Test train readings (i.e., temperatures, pressures, sampling volumes, etc.) were taken every 5 min during each test period. Following completion of each test period, the sample probes were retracted from the stack using a remote positioning device, and the port covers were sealed.

At the completion of the testing, the sample team manually removed the test trains for recovery in the Command Center.

7.3.4 Continuous emission monitoring. A continuous emission monitoring (CEM) system was used to extract a sample of the exhaust gases for analysis of total hydrocarbons, carbon dioxide, carbon monoxide, oxygen, and nitrous oxides.

Total hydrocarbons in the exhaust gases were continuously monitored during each test by EPA Method 25A using a CEM flame ionization detector (FID). The specifications for the instrument are summarized in Table 7-4.

Carbon dioxide and carbon monoxide content was measured continuously using nondispersive infrared gas analyzers. Carbon dioxide concentration was monitored following EPA Method 3A procedures. EPA Method 10 procedures were utilized to measure carbon monoxide content. The specifications for the instruments to monitor carbon dioxide and carbon monoxide are summarized in Tables 7-5 and 7-6, respectively.

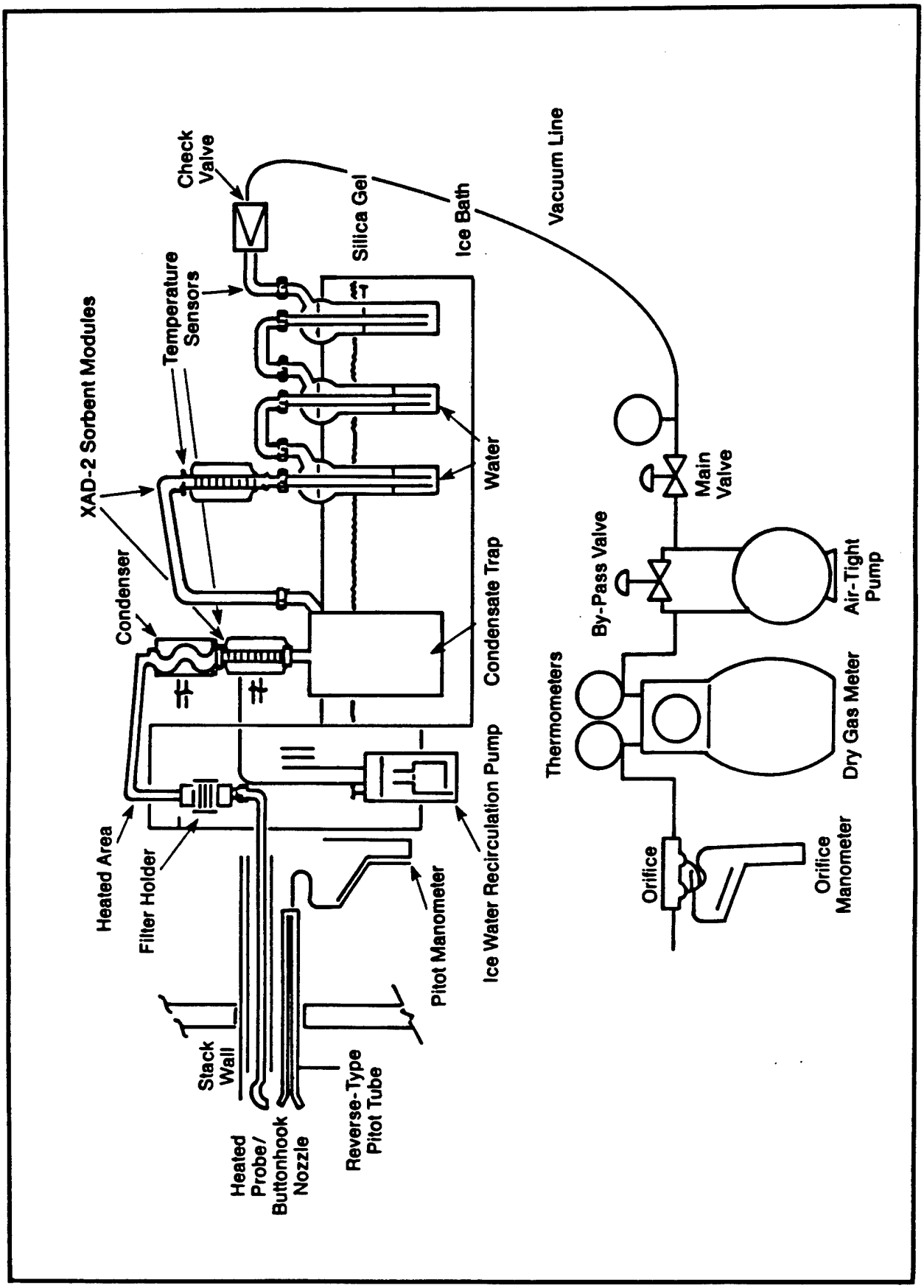
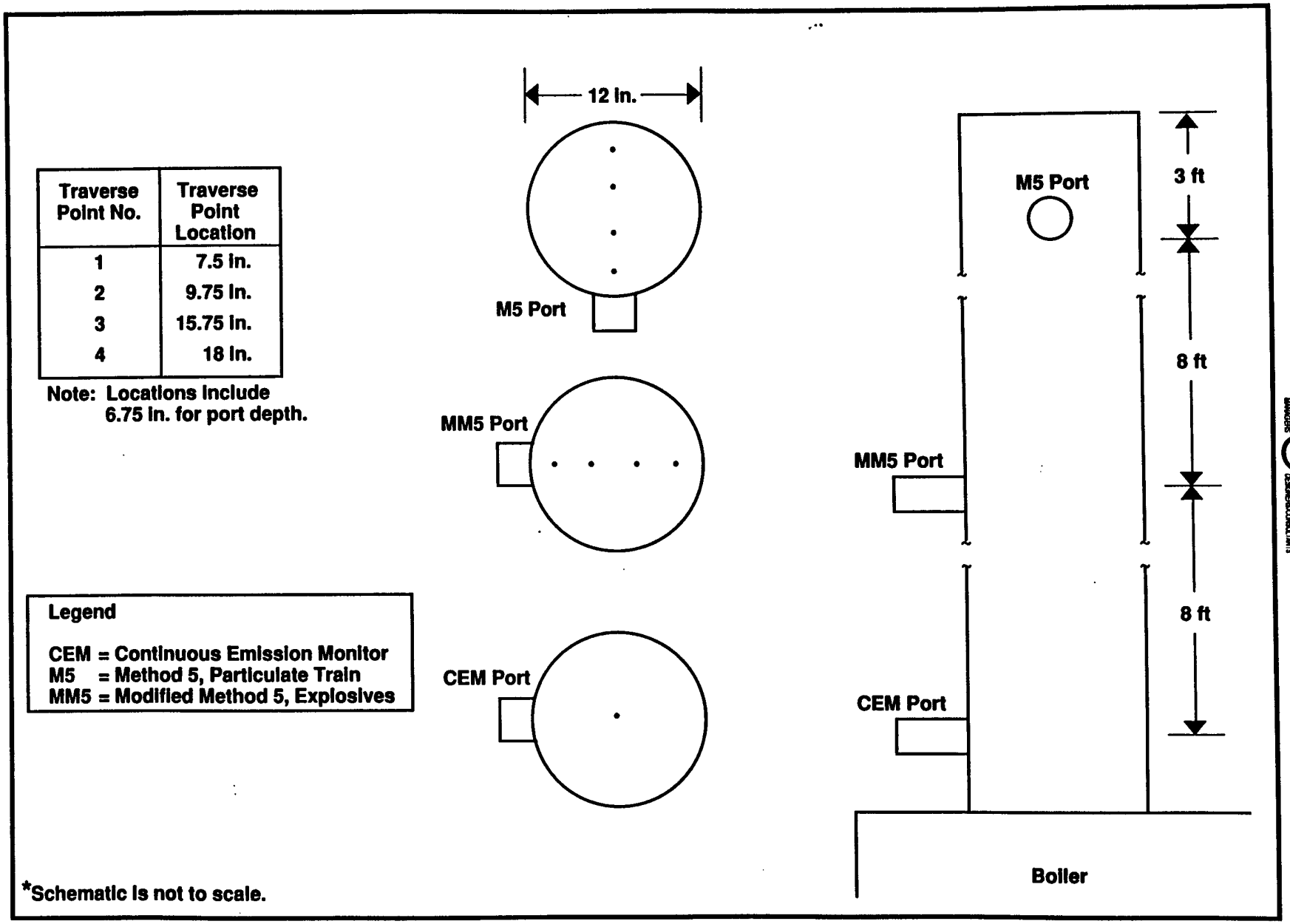


Figure 7-3. EPA Modified Method 5 sampling train for collection of explosives.



Traverse Point No.	Traverse Point Location
1	7.5 in.
2	9.75 in.
3	15.75 in.
4	18 in.

Note: Locations include 6.75 in. for port depth.

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Figure 7-4. Boiler stack sampling point locations.*

Table 7-4. Specifications for the analyzer to monitor total hydrocarbons.

Analysis method:	Flame ionization detector (FID)
Range:	Any three of the following: 0 to 10, 100, 1,000, 10,000, or 100,000 ppm
Response time:	90% of full-scale in less than 1 min
Zero drift:	1% of full-scale per 24 hr
Span drift:	1% of full-scale per 24 hr
Linearity:	Within 1% of selected range
Output:	0 to 10 v DC
Display:	Analog meter in ppm hydrocarbon

Table 7-5. Specifications for the analyzer to monitor carbon dioxide.

Analysis method:	Nondispersive infrared analyzer
Response time:	90% of reading in 1 sec
Accuracy:	±1% of full-scale
Zero drift:	±1% of full-scale per 24 hr
Span drift:	±1% of full-scale per 24 hr
Linearity:	±1% of full-scale
Output:	0 to 100 mv
Display:	Digital meter in % CO_2

Table 7-6. Specifications for the analyzer to monitor carbon monoxide.

Analysis method:	Nondispersive, infrared, single-beam with gas-phase correlation filter.
Range:	0 to 100 ppm or 0 to 1,000 ppm
Response time:	90% within 1 min
Zero drift:	±1% per 24 hr
Span drift:	±1% per 24 hr
Linearity:	Within 1% full-scale
Output:	0 to 10 v DC
Display:	Digital meter in ppm CO

The concentration of oxygen in the exhaust gases was monitored using an electrochemical analyzer following EPA Method 3A protocol. The specifications for the electrochemical analyzer are summarized in Table 7-7.

Nitrous oxides content was continuously monitored by a CEM analyzer using a chemiluminescent reaction and following EPA Method 7E. The specifications for the analyzer are summarized in Table 7-8.

7.4 Explosives solution (sample point 4 in Figure 7-1). The explosives solution was sampled during Test T-9 to quantify the amount of explosives and solvents in the solution. A summary of the sampling and analysis is shown in Table 7-9. Because of the crystallization problems, the solution prepared for Test T-9 was diluted with acetone, toluene, and fuel oil. A grab sample of solution was collected from Tank T-200 after the conclusion of Test T-9b and before starting Test T-9c. The solution was analyzed for TNT by high-pressure liquid chromatography. The solution was also analyzed for toluene and acetone by gas chromatography with a flame ionization detector. Because of the high concentration of explosives and solvents in the solution, the sample was diluted before analysis.

Table 7-7. Specifications for the analyzer to monitor oxygen.

Analysis method:	Electrochemical
Range:	0 to 25%
Response time:	30 sec for 90% response, 10 sec typical for small step change
Accuracy:	2% of full-scale at 72°F, all ranges
Zero drift*:	0.5% O_2 over 24 hr
Span drift*:	0.5% O_2 over 24 hr
Output:	0 to 100 mv
Display:	Digital meter in % O_2
Stability:	2% of full-scale over 30 days typical

*40 CFR 60 required instrument operating parameters.

Table 7-8. Specifications for the analyzer to monitor nitrous oxides.

Analysis method:	Chemiluminescent reaction
Range:	0 to 100; 0 to 250; 0 to 1,000 ppm
Response time:	1.5 sec, NO mode 1.7 sec, NO_x mode
Accuracy:	Derived from the NO or NO_2 calibration gas, ±1% of full-scale
Zero drift:	Negligible after 0.5-hr warmup
Span drift*:	2.5% of full-scale per 24 hr
Linearity:	Within 1% of full-scale
Output:	0 to 10 v DC
Display:	Analog meter in ppm NO, NO_x

*40 CFR 60 required instrument operating parameters.

Table 7-9. Sampling and analysis plan for the explosives solution.

Sampling Point Number	4	
Description	Dissolving Tank Solution	
Test Objective	Determine Solution Composition	
Sampling Objective	Collect a Representative Sample	
Parameters to be Tested	Explosives	Volatile Organics
Test Run Sampled	T-9	T-9
Detection Limit	0.24 mg/L	5 mg/g
Sampling Method	grab sample[a]	grab sample[a]
Sampling Extraction/Analysis Methods	LW02	GC/FID
Sampling or Monitoring Design:		
Total Number of Samples Collected	1	1
Field Blanks	0	0
Trip Blanks	0	0
Method Blanks	1	1
Blank Spikes	1	1
Blank Spike Duplicates	0	0
Number of Sample Replicates	0	0
Total Number of Samples Analyzed	3	3

[a]Liquid siphoned from the tank.

8. OPERATIONAL PARAMETER MONITORING METHODS

The pilot test equipment was monitored continuously using process instruments. Monitors provided data on the following parameters:

- Temperature.
- Pressure.
- Flow.
- Level.
- Viscosity.
- Solution density.

The locations of the instruments are provided in Figure 8-1. The instruments transmitted the process measurement as a 4- to 20-milliamp signal. The signal was displayed on the digital indicators located on the feed and boiler control panels. The control panels were located in the process control room in Building 117-4. Figure 8-2 is a photograph of the two control panels. Data were also recorded on two strip-chart recorders.

The boiler control panel strip-chart recorder was a Honeywell DPR1500. The strip-chart recorded data from 15 channels. Table 8-1 provides a list of the data recorded on each channel. The recorder was connected through a digital link to a personal computer. The computer recorded a snapshot every 5 sec of the process measurements on a file. The files were downloaded daily onto digital media and were used during data analysis. Near the conclusion of the testing, the recorder ink wheel malfunctioned. Because of the malfunction, the strip-chart data from Test T-9 were not available. The recorder remained unrepaired at the conclusion of the test.

The strip-chart recorder for the feed system was a Honeywell Versaprint 131. The strip-chart recorded data on six channels. Table 8-2 provides a list of the data recorded on each channel. The Versaprint recorder was not capable of being digitally stored.

The remainder of this section describes the measurement methods used and any problems encountered with the instruments or monitoring methods.

8.1 Temperature. Temperatures were monitored at six locations on the feed and boiler system by thermocouples. Table 8-3 provides a list of the location, thermocouple type, and calibration range for each temperature monitor. The Accutech Model AI-2000 temperature transmitter on Tank T-100 failed during Test T-5. The transmitter was returned to the manufacturer and replaced with a new model. The calibration ranges for the T-100, T-200, and T-300 temperature transmitters were each set at a 40°F to 200°F scale. The ambient temperature during some of the testing was below 40°F; accordingly, the monitors did not accurately represent the solution temperature. The Accutech AI-2000 was shop-calibrated

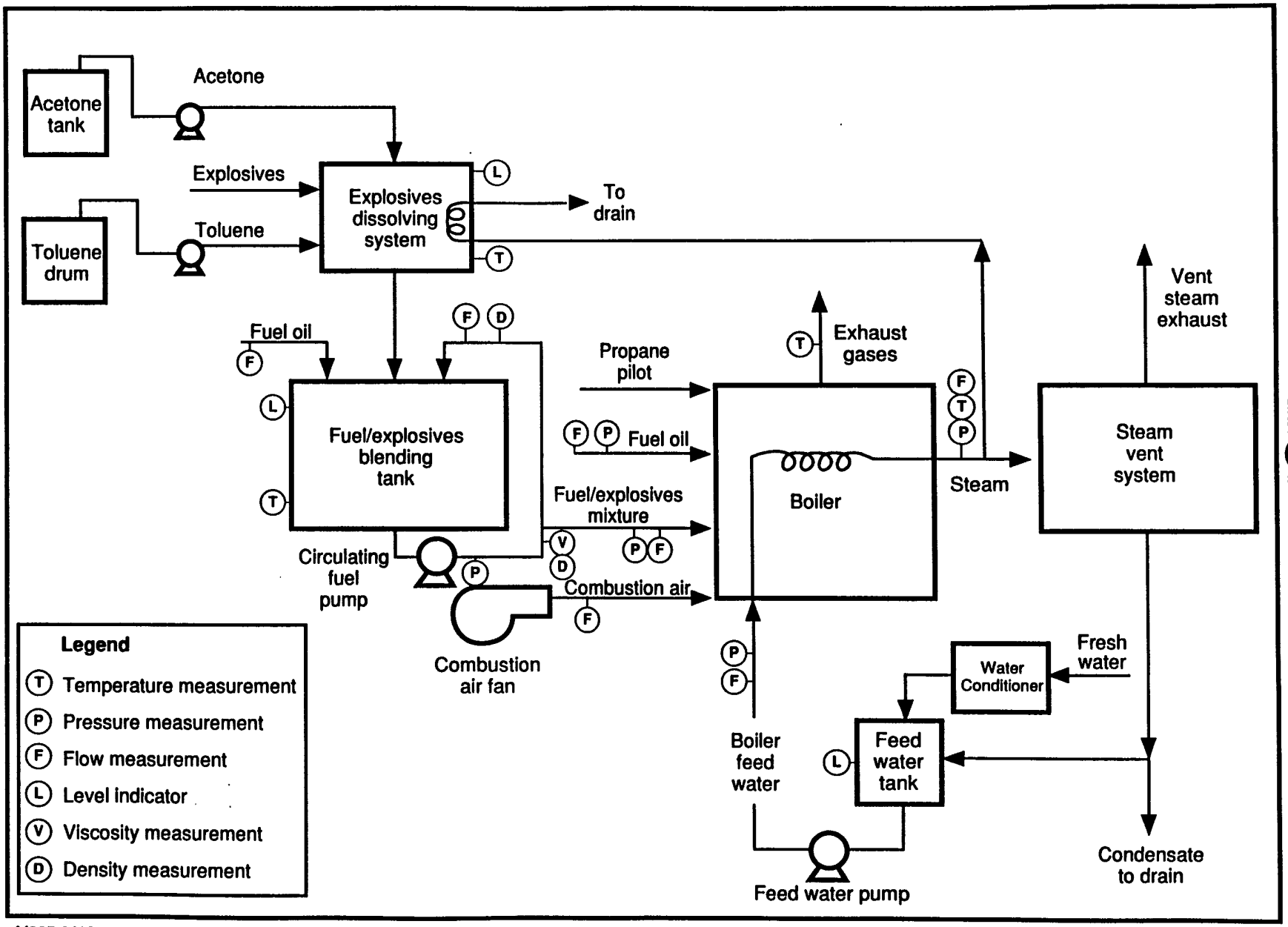

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Figure 8-1. Locations of process instruments.

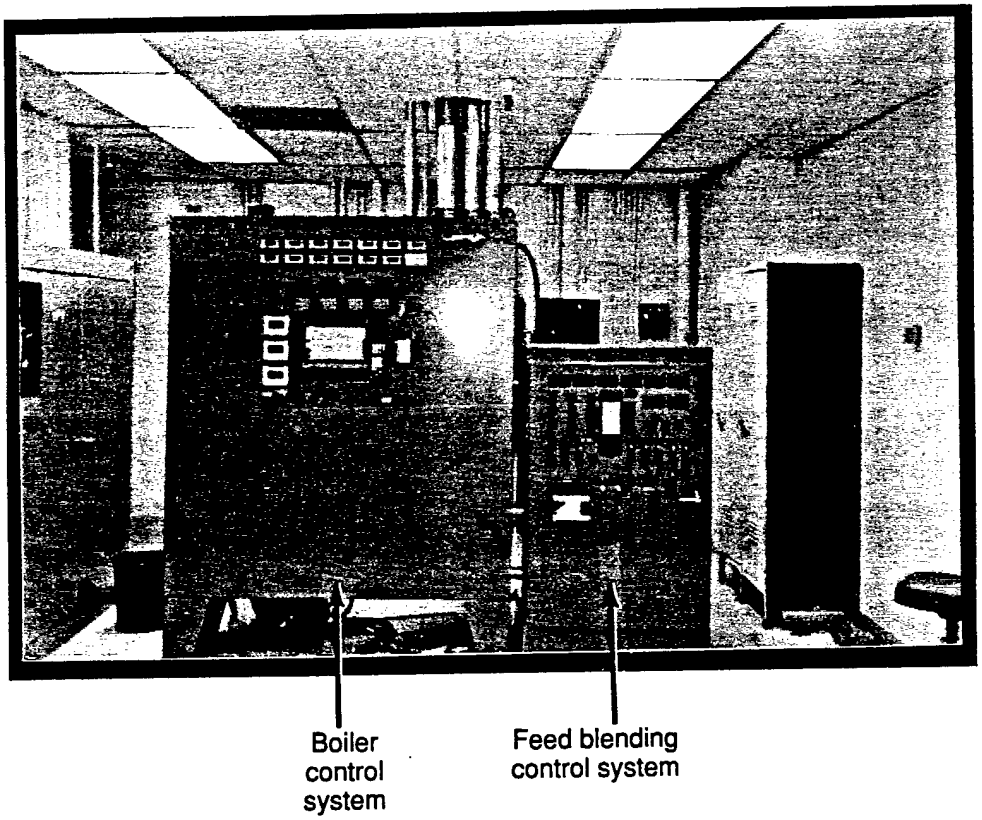


Figure 8-2. Photograph of process control panels.

Table 8-1. Boiler system data recorder.

Channel	Measurement	Units
1	Steam flow	lb/hr
2	Steam pressure	psig
3	Steam temperature	°F
4	Stack temperature	°F
5	Compressed air pressure	psig
6	Feed water flow	gph
7	Feed water temperature	°F
8	Feed water pressure	psig
9	Feed water tank level	in.
10	Fuel oil flow rate	gph
11	Fuel oil burner pressure	psig
12	Slurry/solution flow rate	gph
13	Slurry/solution burner pressure	psig
14	Slurry/solution viscosity	cp*
15	Combustion air flow	cfm

*Centipoise.

Table 8-2. Feed system data recorder.

Channel	Measurement	Units
1	Tank T-100 temperature	°F
2	Tank T-200 temperature	°F
3	Tank T-300 temperature	°F
4	Slurry/solution pump discharge pressure	psig
5	Slurry/solution specific gravity	SU[a]
6	Slurry/solution recycling flow rate	gpm

[a]SU = Standard units relative to water (1 gm/cc).

Table 8-3. Temperature monitors.

Location	Thermocouple Type	Transmitter Scale	
		Minimum (°F)	Maximum (°F)
Stack exhaust gas	K[a]	0	1,000
Steam	K	0	300
Boiler feed water	K	0	300
Tank T-100	J[b]	40	200
Tank T-200	J	40	200
Tank T-300	J	40	200

[a]Type K thermocouple = Iron/constantan junction.
[b]Type J thermocouple = Chromel/alumel junction.

and could not be field-calibrated. For future operations, it is recommended that the calibration program for the Accutech transmitters be purchased. The program will allow adjustment of the low and high ranges for the range corresponding to actual conditions. The transmitters for the boiler system were Honeywell Smart® transmitters. The Honeywell equipment was supplied with a calibrator/communicator instrument that allowed remote and relatively easy calibration and adjustment of the instruments.

8.2 Pressure. System pressure was monitored remotely at six locations on the system. The locations of the monitors are provided in Table 8-4. In addition to the remote monitors, pressure gauges were located at critical locations on all process piping to assist in startup and debugging operations. Because of the potential for stagnant locations within the pressure gauges and transmitters, the pressure-sensing instruments on the explosives solution lines were provided with isolation discs.

8.3 Flow. Flow of process fluids was measured at six locations within the system. Table 8-5 provides the locations of flow measurement along with the method and calibration range for each of the instruments. Flow measurements for fuel oil to the burner, feed water to the boiler, and steam generation were made using sharp-edge orifices and differential pressure measurements. Each of these systems performed well.

The flow measurements made by the steam orifice meter must be adjusted to reflect differences between actual steam density and the calibrated steam density. The flow of feed water to the boiler and steam exiting the boiler should have indicated similar values. The feed water rate consistently was below the steam rate. Unfortunately, the discrepancy was discovered after demobilization, and a cause for the discrepancy could not be determined.

The flow measurement for the explosives solution being recycled to the blending tank was performed by a K-Flow Model K-250 Coriolis effect mass flow meter. The K-flow meter also provided density measurements as described in Subsection 8.6. The K-flow housing was customized with a compressed air purge system complete with an air flow and air pressure switch to meet the Division I, Class II electrical location requirements. Measurements of the flow of combustion air and explosives solution to the boiler proved difficult to obtain. A description of each system and the difficulties encountered is presented in the following subsections.

8.3.1 Combustion air flow. The combustion air fan for the boiler was constructed as an integral piece of the boiler housing. Because of the equipment configuration (as shown in Figure 8-3), a straight section of ducting was not available for air flow measurement.

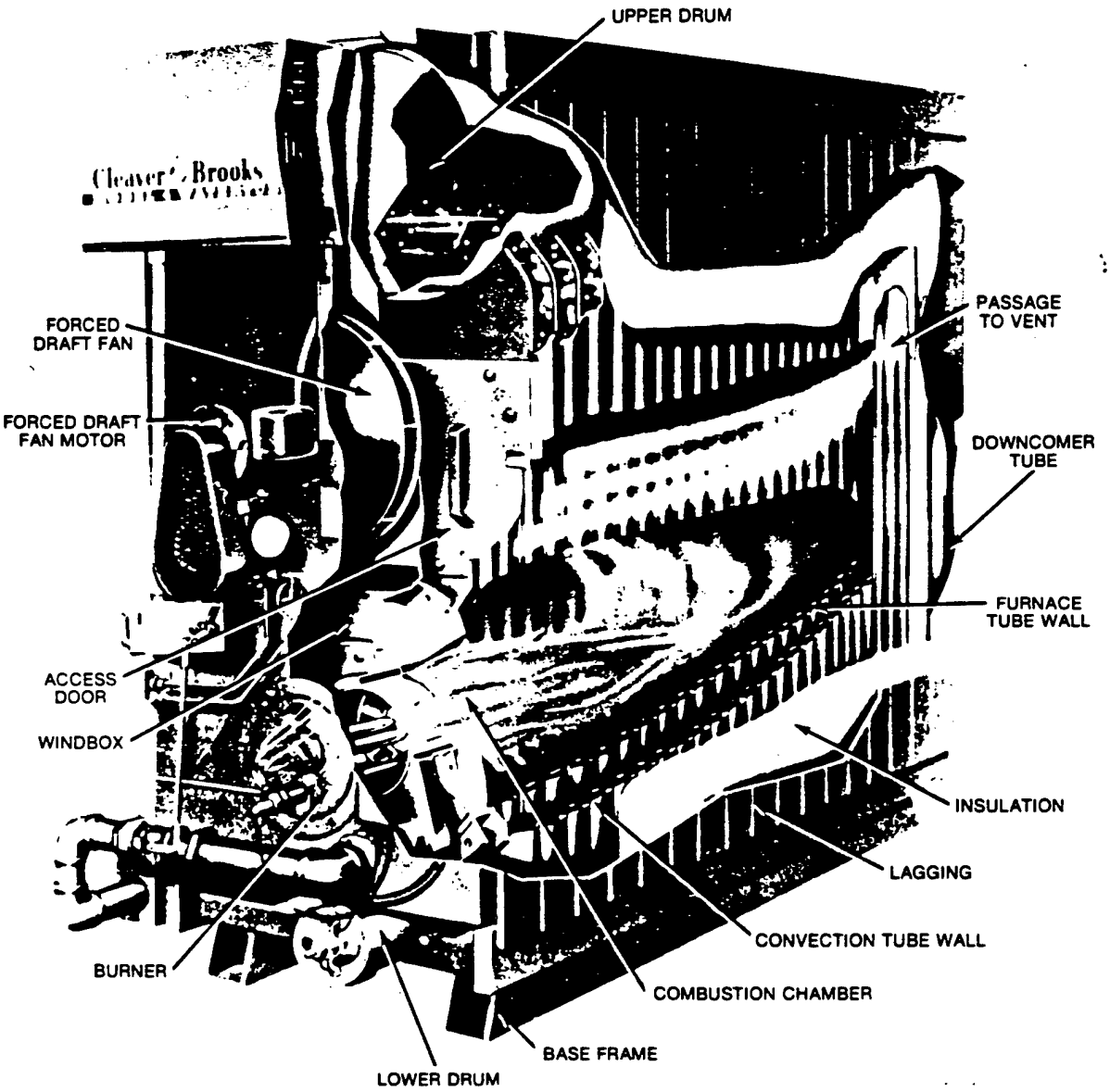
Consequently, the combustion air flow was measured by the differential pressure between the windbox and combustion chamber. Prior to boiler testing, the combustion air flow rate was measured

Table 8-4. Pressure monitors.

Location	Transmitter Scale (psig)
Feed water pressure	0 to 100
Steam pressure	0 to 30
Fuel oil burner pressure	0 to 100
Slurry burner pressure	0 to 100
Burner compressed air pressure	0 to 100
Slurry pump discharge pressure	40 to 200

Table 8-5. Flow measurements.

Location	Measurement Method	Transmitter Scale Minimum to Maximum
Feed water flow	Differential pressure across orifice plate	0 to 20 gph
Steam flow	Differential pressure across orifice plate	0 to 2,000 lb/hr
Fuel oil flow	Differential pressure across orifice plate	0 to 20 gph
Slurry to burner	Differential pressure across venturi	0 to 20 gph
Slurry recycle	Coriolis effect meter	0 to 100 gpm
Combustion air	Differential pressure across burner throat	0 to 230 scfm



Source: Cleaver Brooks Operations Manual.

Figure 8-3. Cutaway of a typical Model 4 boiler.

using a pitot tube in the stack. A correlation between the square root of the pressure drop across the burner throat and the actual air flow measurement was made. Figure 8-4 provides a comparison of the actual flow measurements and the fan damper position.

8.3.2 Solution flow. The measurement of flow of the explosives solution was planned to be made by differential pressure across an orifice plate in a method similar to fuel oil measurement. The potential safety hazard with deposits of explosives solids in the stagnant areas around the orifice resulted in the abandonment of the system. After an exhaustive search, the most reliable system that could measure the relatively small flow (0 to 20 gph) and be unaffected by the potential slurry was found to be a venturi flow meter. A custom venturi flow meter was manufactured for this project. Figure 8-5 provides a scale drawing of the venturi.

The operation of the venturi flow meter was very troublesome. Calibrations were conducted routinely, and the differential pressure and flows varied widely. The flow meter provided relative indication of rates, but could not be used as an accurate measurement device. Consistent control of excess air required an accurate and absolute measurement of fuel oil and explosives solution entering the boiler. The inaccuracy of the explosives flow measurement did not allow for automatic control of excess air rates when solution was fired.

During operation of Test T-9, which involved crystallized TNT, the venturi plugged on numerous occasions. The plugging was determined by deduction of available evidence to be occurring in the inlet throat to the venturi. A malfunctioning check valve in the explosives solution burner allowed compressed air to be introduced into the solution piping and to backflush the venturi. Several attempts at backflushing were required to clear the plugged venturi. To reduce the occurrence of plugging by crystallization, the venturi was heated by blasting steam on its exterior.

It is unusual that the venturi, which had a throat diameter of 0.070-in., plugged, while the burner nozzle with 0.064-in. diameter orifices, did not plug. It is believed that the funneling nature of the venturi inlet in comparison to the shearing action of the burner nozzle is the cause of different reactions to the solids in the solution.

8.4 Level. Level was measured in the feed water tank and in solution blending Tank T-300 on a continuous basis. The level in the mixing tanks was measured at two locations (low and high level) by float-type switches. The continuous measurement of level in the feed water tank was made by measurement of differential pressure of the water in the tank and atmosphere. The level was reported as inches depth. The feed water tank in the horizontal position did not allow the use of a simple linear method to convert depth to volume of liquid storage.

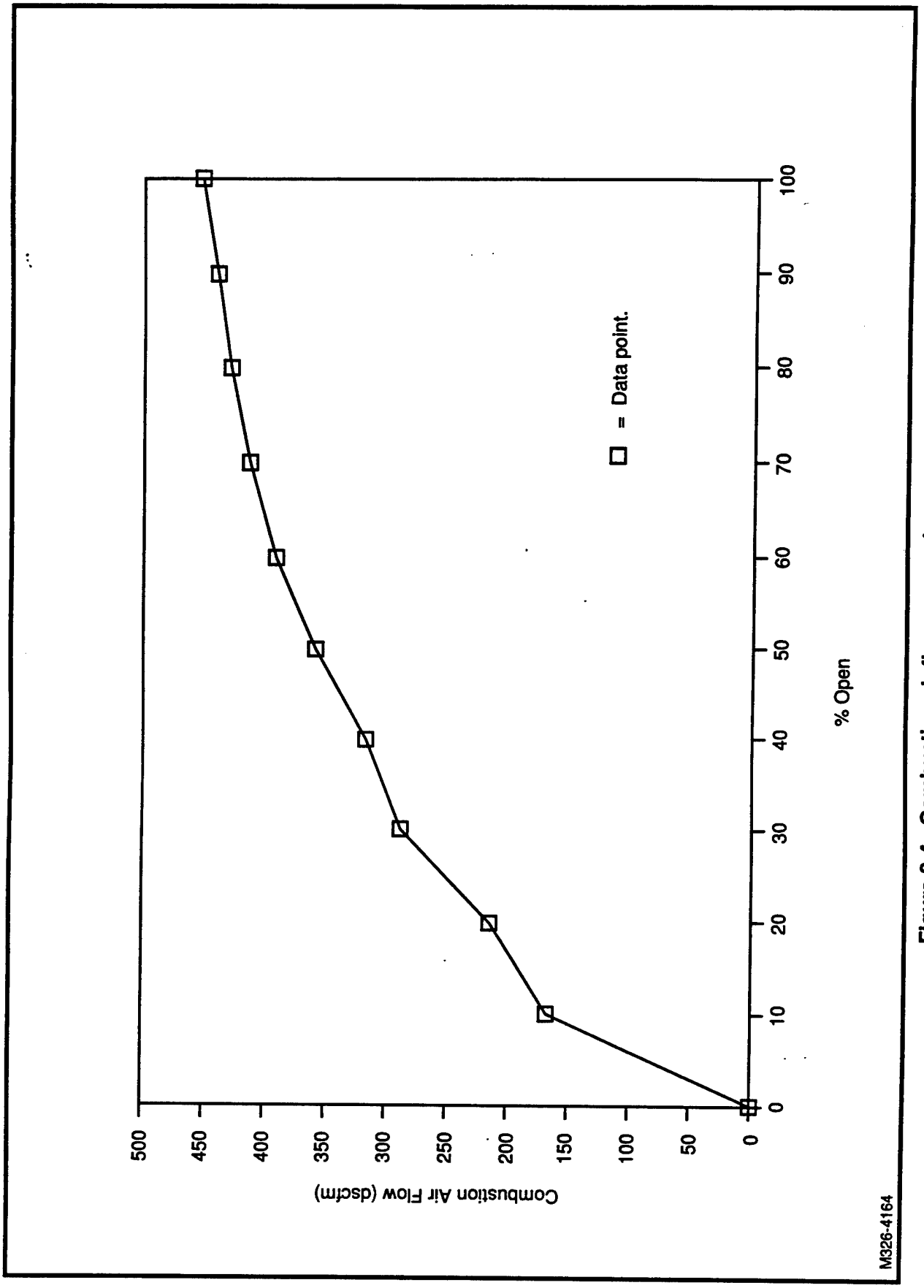


Figure 8-4. Combustion air flow versus damper position.

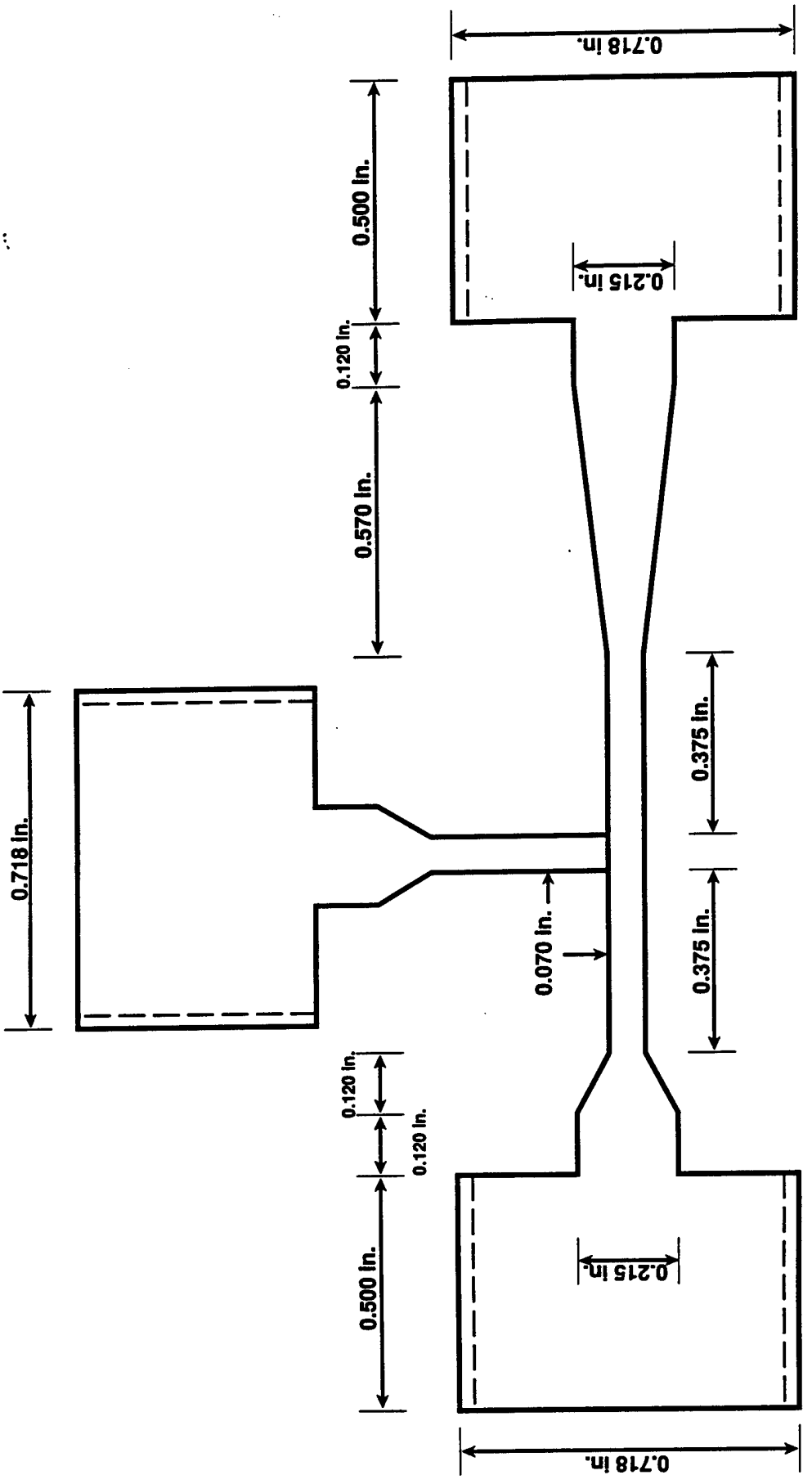


Figure 8-5. Cross-sectional view of the venturi flow meter.

The depth of the blending Tank T-300 was made by a Millitronics Multiranger Plus sonic-type meter. The instrument measures depth by reflection of sound waves from the surface of the liquid. The speed of sound and, therefore, the accuracy is highly affected by the ambient temperature and composition of the air in the tank. The instrument provided excellent relative measurements of level, but, because of the variable atmospheric conditions in the tank, it was often difficult to determine the absolute volume of liquid. The compensation for air temperature was made manually by the system operators; however, the instrument does have the option of adding an automatic temperature compensation component. The manufacturer can add a customized feature to provide a reference target that will allow automatic compensation for atmospheric conditions. Both of these changes are highly recommended.

8.5 Viscosity. Viscosity was planned to be measured at two locations: (1) in the recycling line to the explosives solution blending tank and (2) at the boiler skid prior to firing the boiler. The viscometer on the recycling line could not be supplied because an instrument meeting the electrical classification and having a physical configuration that did not allow the potential for buildup of solids could not be located. The viscometer selected for measuring the fluid viscosity on the boiler skid was a Brookfield TT100. This instrument measured viscosity by sensing the angular deflection of a stator that was caused by a continuously rotating rotor. Figure 8-6 provides a schematic of the internal parts of the viscometer.

The data collected by the instrument were questionable because the data varied widely and did not change as expected when various fluids were changed. Also, during calibration checks and inspections, the interior chamber surrounding the rotor was found to contain a significant deposit of solids. The drive shaft seal was found to be damaged and leaking explosives solution after relatively short service time. The seal was suspected of failing because the rotor motor was operating during dry conditions. The seal was replaced, and the viscometer motor was interlocked to the circulating pump operation. The replacement seals failed after fewer than 30 days of operation. The future use of this instrument should be studied.

8.6 Density. The density of the explosives solution was measured at the boiler skid and in the recycling line to the blending tank. The density measurement on the boiler skid was performed by a Sensall Model 4940 sludge density monitor. The density meter utilized ultrasonic transmission to determine the concentration of solids in the solution. The instrument reported the results on a percent solids basis. Since calibration with a known solids content solution was not possible, the indications from the instrument were considered relative.

During Test T-9 when crystallized TNT was found in the tanks and piping system, the densimeter provided a reading of substantial solids content. Also, when plugging and operational problems with

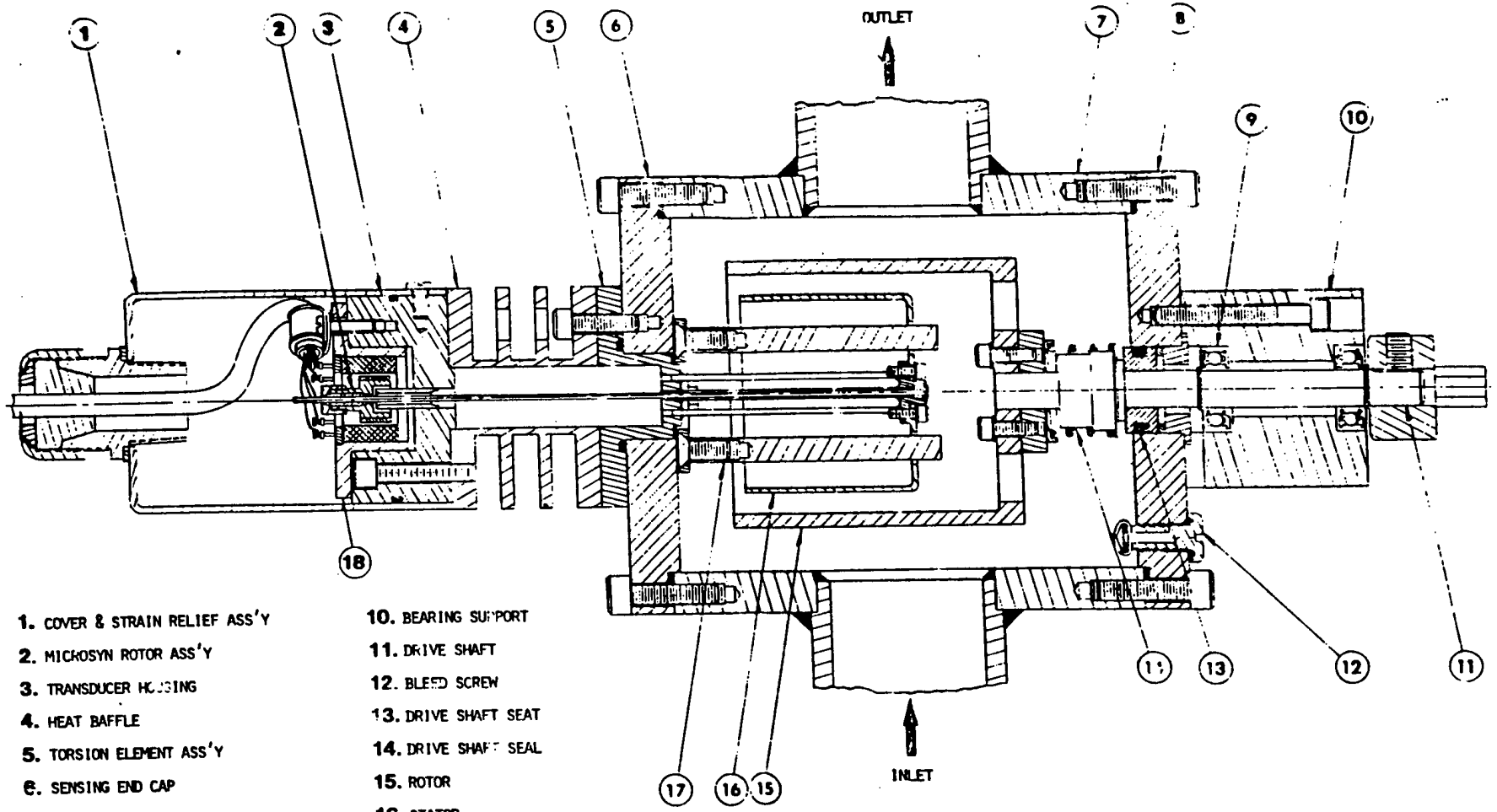


Figure 8-6. Inline viscometer assembly.

the venturi flow meter were encountered, the densimeter had indicated solids being present in the solution.

The second densimeter was the specific gravity indication from the Coriolis effect mass meter. The density measurements provided by the K-flow meter did vary according to solution composition changes as expected; however, the instrument did not indicate wide fluctuations in the operating density when solids were circulating.

9. DISCUSSION OF RESULTS

During the test program, data were collected from process instruments, emission sampling equipment, and observations made during the testing. The data collected are summarized and discussed in this section. The data are discussed according to the following major categories:

- Stack emission characterization.
- Boiler efficiency and operation with TNT supplemental fuel.
- Feed system mixing and handling.

9.1 Stack emissions. Stack discharge gases were sampled during each of the test runs. The data collected were used to determine particulate emission rates, destruction and removal efficiencies for TNT, combustion efficiency, nitrous oxide generation rates, and products of incomplete combustion. A discussion of the results, correlations, and applicable regulations is presented in the following subsections.

9.1.1 Particulate emission rate results. The particulate emission rates were determined for Tests T-1a, T-1b, T-1c, T-2, T-3, and T-5. The data for each test run are presented in Tables 9-1a and 9-1b. Detailed stack sampling data are provided in Appendix B. The measured emission rates for particulate were corrected to a 7% oxygen content. The formula for correcting for 7% oxygen content is as follows:

$$Pc = Pm \times \frac{(14)}{21-Ym}$$

Where:

Pc = Particulate emission rate corrected to 7% oxygen (gr/dscf).

Pm = Particulate emission rate as measured (gr/dscf).

Ym = Oxygen concentration as measured in exit gas (%).

A summary of the particulate emission rates is provided in Table 9-2. Comparisons of corrected particulate emission rates for each test run are shown in Figure 9-1. Test T-5 involved firing an explosives solution. The remainder of the test runs involved firing fuel oil only. The particulate emission rate measured while firing explosives solution is on the same order of magnitude as rates measured when firing fuel oil only.

Table 9-1a. Summary of particulate test data and test results for Tests T-1a, T-1b, and T-1c.

TEST DATA:			
Test Run Number	T-1a	T-1b	T-1c
Test Location		Boiler Outlet	
Test Date	10-22-90	10-27-90	10-30-90
Test Time Period	1601-1720	2218-0134	1310-1430
SAMPLING DATA:			
Sampling duration (min)	60.0	80.0	80.0
Nozzle diameter (in.)	0.500	0.430	0.484
Cross-sectional nozzle area (ft^2)	0.001364	0.001008	0.001278
Barometric pressure (in. Hg)	26.00	25.77	25.50
Average orifice pressure differential (in. H_2O)	1.85	0.85	1.46
Average dry gas meter temperature (°F)	84	80	89
Average absolute dry gas meter temperature (°R)	544	540	549
Total liquid collected by train (mL)	88.0	76.0	107.0
Standard volume of H_2O vapor collected (ft^3)	4.1	3.6	5.0
Dry gas meter calibration factor	1.008	1.008	1.008
Sample volume at meter conditions (dcf)	46.137	41.660	55.193
Sample volume at standard conditions (dscf)[a]	39.386	35.410	45.786
Percent of isokinetic sampling	97.7	96.6	97.7
GAS STREAM COMPOSITION DATA:			
CO_2, % by volume, dry basis	10.7	8.7	12.1
O_2, % by volume, dry basis	6.5	9.3	5.0
CO, ppm by volume, dry basis	42.7	63.0	13.6
N_2, % by volume, dry basis	82.8	82.0	82.9
Molecular weight of dry gas (lb/lb mole)	30.0	29.8	30.1
H_2O vapor in gas stream (prop. by vol.)	0.095	0.092	0.099
Mole fraction of dry gas	0.905	0.908	0.901
Molecular weight of wet gas (lb/lb mole)	28.8	28.7	28.9
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:			
Static pressure (in. H_2O)	-0.05	-0.05	-0.07
Static pressure (in. Hg)	-0.004	-0.004	-0.005
Absolute pressure (in. Hg)	26.00	25.77	25.49
Average temperature (°F)	583	479	532

Table 9-1a
(continued)

TEST DATA:			
Test Run Number	T-1a	T-1b	T-1c
Test Location		Boiler Outlet	
Test Date	10-22-90	10-27-90	10-30-90
Test Time Period	1601-1720	2218-0134	1310-1430
Average absolute temperature (°R)	1,043	939	992
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	4	4	4
Average gas stream velocity (ft/sec)	20.7	17.2	18.7
Stack/duct cross-sectional area (ft^2)	0.79	0.79	0.79
Average gas stream volumetric flow (wacf/min)	973	811	882
Average gas stream volumetric flow (dscf/min)	387	357	360
Particulate Emissions:			
Total particulate catch (g)	0.0040	0.0232	0.0046
Concentration (gr/dscf)	0.0016	0.0101	0.0016
Mass rate (lb/hr)	0.005	0.031	0.005

[a]Standard conditions = 68°F (20°C) and 29.92 in. Hg (760 mm Hg).
[b]As measured by the WESTON CEM trailer.

Table 9-1b. Summary of particulate test data and test results for Tests T-2, T-3, and T-5.

TEST DATA:			
Test Run Number	T-2	T-3	T-5
Test Location		Boiler Outlet	
Test Date	10-23-90	10-25-90	10-31-90
Test Time Period	1726-1826	1607-1727	2335-0111
SAMPLING DATA:			
Sampling duration (min)	60.0	80.0	80.0
Nozzle diameter (in.)	0.500	0.430	0.430
Cross-sectional nozzle area (ft^2)	0.001364	0.001008	0.001008
Barometric pressure (in. Hg)	25.90	25.80	25.54
Average orifice pressure differential (in. H_2O)	2.43	1.12	1.41
Average dry gas meter temperature (°F)	89	86	85
Average absolute dry gas meter temperature (°R)	549	546	545
Total liquid collected by train (mL)	111.0	112.0	108.0
Standard volume of H_2O vapor collected (ft^3)	5.2	5.3	5.1
Dry gas meter calibration factor	1.008	1.008	1.008
Sample volume at meter conditions (dcf)	52.593	47.396	53.104
Sample volume at standard conditions (dscf)[a]	44.402	39.944	44.429
Percent of isokinetic sampling	98.9	98.0	97.1
GAS STREAM COMPOSITION DATA:			
CO_2, % by volume, dry basis	11.3	11.6	10.4
O_2, % by volume, dry basis	5.7	6.6	7.2
CO, ppm by volume, dry basis	47.0	49.5	28.7
N_2, % by volume, dry basis	83.0	81.8	82.4
Molecular weight of dry gas (lb/lb mole)	30.0	30.1	30.0
H_2O vapor in gas stream (prop. by vol.)	0.105	0.117	0.103
Mole fraction of dry gas	0.895	0.883	0.897
Molecular weight of wet gas (lb/lb mole)	28.8	28.7	28.7
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:			
Static pressure (in. H_2O)	-0.07	-0.06	-0.06
Static pressure (in. Hg)	-0.005	-0.004	-0.004
Absolute pressure (in. Hg)	25.89	25.80	25.54
Average temperature (°F)	565	565	570

Table 9-1b
(continued)

TEST DATA:			
Test Run Number	T-2	T-3	T-5
Test Location		Boiler Outlet	
Test Date	10-23-90	10-25-90	10-31-90
Test Time Period	1726-1826	1607-1727	2335-0111
Average absolute temperature (°R)	1,025	1,025	1,030
Pitot tube coefficient	0.84	0.84	0.84
Total number of traverse points	4	4	4
Average gas stream velocity (ft/sec)	22.9	21.5	24.1
Stack/duct cross-sectional area (ft^2)	0.79	0.79	0.79
Average gas stream volumetric flow (wacf/min)	1,081	1,018	1,142
Average gas stream volumetric flow (dscf/min)	431	399	448
Particulate Emissions:			
Total particulate catch (g)	0.0051	0.0221	0.0110
Concentration (gr/dscf)	0.0018	0.0085	0.0038
Mass emission rate (lb/hr)	0.006	0.029	0.015

[a]Standard conditions = 68°F (20°C) and 29.92 in. Hg (760 mm Hg).
[b]As measured by the WESTON CEM trailer.

Table 9-2. Summary of particulate emission rates for each test.

Test Run Number	Actual Particulate Emission Rate (gr/dscf)	Oxygen Concentration in Stack (%)	Particulate Emission Rate Corrected to 7% O_2 (gr/dscf)
T-1a	0.0016	6.5	0.0015
T-1b	0.0101	9.3	0.0121
T-1c	0.0016	5.0	0.0014
T-2	0.0018	5.7	0.0016
T-3	0.0085	6.6	0.0083
T-5	0.0038	7.2	0.0039

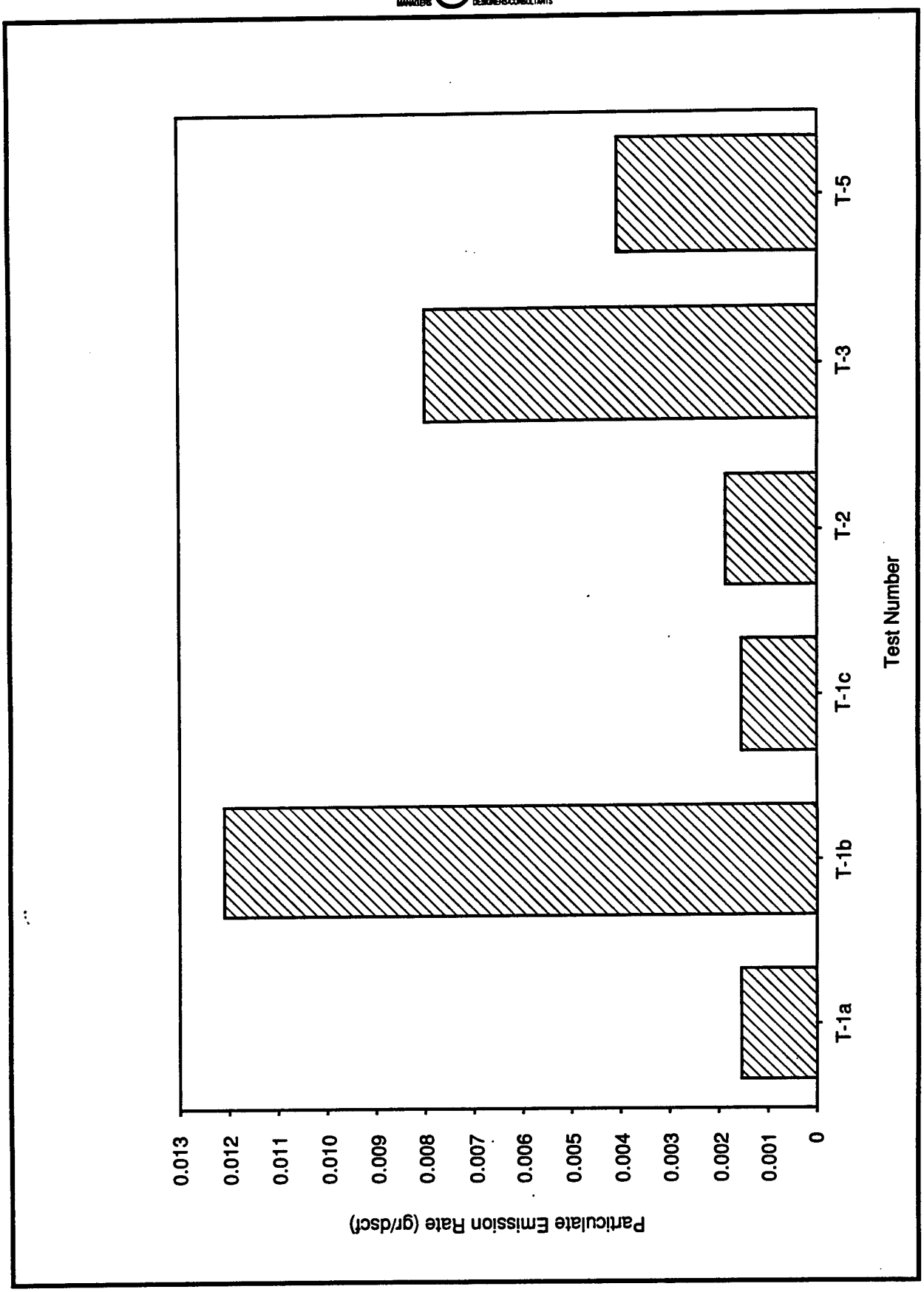


Figure 9-1. Particulate emission rate corrected to 7% oxygen.

9.1.2 Particulate emission rate correlations. A series of linear regression analyses was performed on the particulate emission data to determine whether the particulate emission rate was related to common incinerator performance variables. The three incinerator performance variables selected for evaluation were oxygen content in the stack, combustion (stack) temperature, and retention time. The relationship with oxygen provided the most effective correlation. The coefficient of determination (R^2) was used to determine the most effective correlation. A correlation relating particulate emission rate to oxygen content in the stack is described by the equation:

$$Pe = (0.00253 \times Ym) - 0.01220$$

Where:

Pe = Estimated particulate emission rate corrected to 7% O_2.

Ym = Oxygen concentration as measured in exit gas (%).

R^2 for this equation was 71.5%. A comparison of the actual data points to a curve of the linear correlation is shown in Figure 9-2. The particulate emission from the boiler is primarily soot (particles of unburned carbon). As oxygen concentration in exit gas increases, the flame temperature generated in the combustion zone decreases, which is a probable cause of the creation of increased soot.

9.1.3 Particulate emission rate regulations. The regulations governing the destruction of hazardous waste, including explosives wastes, are outlined in the Resource Conservation and Recovery Act (RCRA) and its amendments. The criteria for industrial boilers incinerating hazardous waste are contained in 40 CFR 266, Subpart D, entitled Hazardous Waste Burned for Energy Recovery. The criteria for particulate emission rates are not specifically regulated in the current RCRA statutes; however, in May and October 1989, the U.S. Environmental Protection Agency (EPA) published proposed revisions to the regulations that would require a boiler to meet a particulate emission level of 0.08 grain/dry standard cubic foot (gr/dscf) (corrected to 7% oxygen). The proposed emission level is equivalent to current particulate emission requirements for hazardous waste incinerators. During Test T-5, the boiler generated particulate matter at a rate of 0.00039 gr/dscf, which is one order of magnitude lower than that required by the proposed regulations.

9.1.4 Explosives emission results. The stack gases were sampled for explosives during Test T-5. Test T-5 was performed by cofiring a 1% TNT solution with fuel oil. The TNT solution provided 62% of the total heat input to the boiler. The sampling data for the explosives testing are provided in Table 9-3. The stack emission sample was analyzed for TNT and RDX. Analytical results

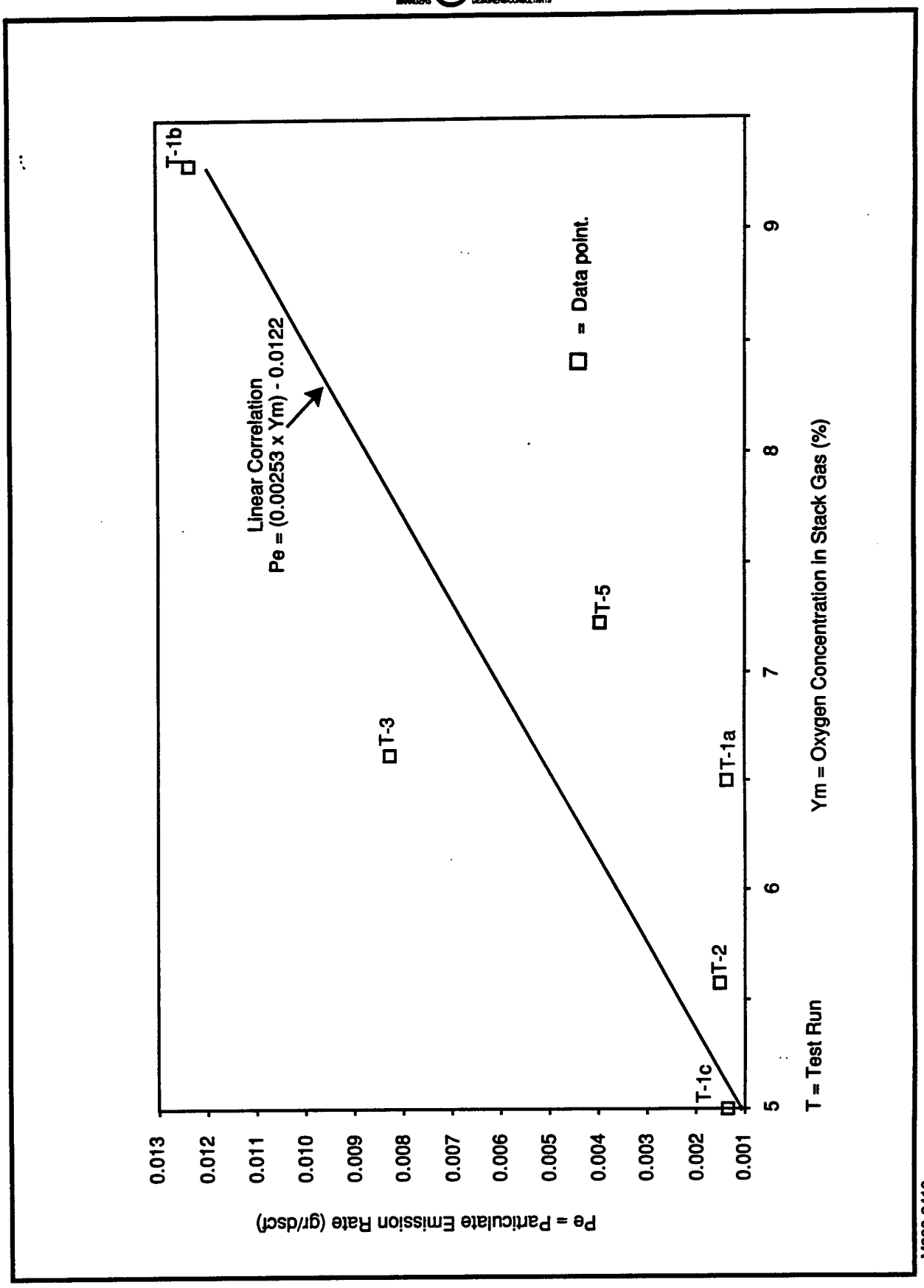


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Figure 9-2. Comparison of particulate emission rate to oxygen concentration in stack gas.

Table 9-3. Summary of sampling data and explosives test results for Test T-5.

TEST DATA:	
Test Run Number	T-5
Test Location	Outlet
Test Date	10-31-90
Test Time Period	2335-0111
SAMPLING DATA:	
Sampling duration (min)	80.0
Nozzle diameter (in.)	0.402
Cross-sectional nozzle area (ft^2)	0.000881
Barometric pressure (in. Hg)	25.54
Average orifice pressure differential (in. H_2O)	1.15
Average dry gas meter temperature (°F)	83
Average absolute dry gas meter temperature (°R)	543
Total liquid collected by train (mL)	81.0
Standard volume of H_2O vapor collected (ft^3)	3.8
Dry gas meter calibration factor	1.000
Sample volume at meter conditions (dcf)	48.085
Sample volume at standard conditions (dscf)[a]	40.037
Percent of isokinetic sampling	98.4
GAS STREAM COMPOSITION DATA:	
CO_2, % by volume, dry basis	10.4
O_2, % by volume, dry basis	7.2
CO, ppm by volume, dry basis	28.7
N_2, % by volume, dry basis	82.4
Molecular weight of dry gas (lb/lb mole)	30.0
H_2O vapor in gas stream (prop. by vol.)	0.087
Mole fraction of dry gas	0.913
Molecular weight of wet gas (lb/lb mole)	28.9
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:	
Static pressure (in. H_2O)	-0.07
Static pressure (in. Hg)	-0.005
Absolute pressure (in. Hg)	25.53
Average temperature (°F)	627

Table 9-3
(continued)

TEST DATA:	
Test Run Number	T-5
Test Location	Outlet
Test Date	10-31-90
Test Time Period	2335-0111
Average absolute temperature (°R)	1,087
Pitot tube coefficient	0.84
Total number of traverse points	4
Average gas stream velocity (ft/sec)	25.4
Stack/duct cross-sectional area (ft^2)	0.79
Average gas stream volumetric flow (wacf/min)	1,205
Average gas stream volumetric flow (dscf/min)	456
EXPLOSIVES EMISSIONS:	
2-4-6-Trinitrotoluene (TNT)	
Concentration (lb/dscf)	7.49E-10
Concentration (ppm/v)	1.27E-03
Mass emission rate (lb/hr)	2.05E-05
RDX	
Concentration (lb/dscf)	< 2.79E-10
Concentration (ppm/v)	< 4.83E-04
Mass emission rate (lb/hr)	< 7.62E-06

[a]Standard conditions = 68°F (20°C) and 29.92 in. Hg (760 mm Hg).

indicated that there was a small emission of TNT (1.27 ppb/vol) and, as expected, no detectable emission of RDX.

9.1.5 Explosives emission regulations. As discussed in Subsection 9.1.3, EPA has proposed modifications to the current regulations for boilers burning hazardous waste for energy. The proposed regulations would require a destruction and removal efficiency (DRE) for the principal organic hazardous constituent (POHC) of 99.99%, where DRE is calculated as follows:

$$DRE = 100\% \times \frac{(W_{in} - W_{out})}{W_{out}}$$

Where:

DRE = Destruction and removal efficiency (%).

W_{in} = Mass flow rate of POHC (TNT) into the boiler (lb/hr).

W_{out} = Emission flow rate of POHC (TNT) (lb/hr).

The determination of the mass flow rate of TNT to the boiler was not straightforward. During Test T-5, the venturi flow meter measuring the rate of explosives solution was not operating properly. The solution flow rate was determined indirectly using the change in solution volume in the blending tank (Tank T-300) over time. A summary of the tank level and corresponding volume during the test is shown in Table 9-4.

A linear regression analysis was completed on the volume-versus-time measurements to develop an equation that would estimate the mass feed rate to the boiler. The equations generated is:

$$V_c = 26.97 - 0.1199(Te)$$

Where:

V_c = Calculated tank volume (gal).
Te = Elapsed time (min).

The coefficient of determination (R^2) for the linear regression was 99.8%. A comparison of the measured tank volume to the linear correlation is shown in Figure 9-3. Using the developed equation, the calculated rate of explosives solution flow to the boiler was 7.15 gallons per hour (gph).

The DRE for TNT was calculated to be 99.996%, using the mass of TNT in the explosives solution and detected TNT stack emission.

9.1.6 Combustion efficiency results. The concentrations of carbon dioxide and carbon monoxide in the stack gases were monitored by the continuous emission monitoring (CEM) system. Monitoring

Table 9-4. Summary of blending tank level and corresponding volume measured during Test T-5.

Date	Actual Time	Elapsed Time (min)	Tank T-300 Level (in.)	Volume in Tank[a] (gal)
31 Oct. 1990	2315	0	8.7	27.5
	2330	15	8.1	25.6
	2345	30	7.5	23.7
1 Nov. 1990	0000	45	6.6	20.9
	0015	60	6.2	19.6
	0030	75	5.6	17.7
	0045	90	5.1	16.1
	0100	105	4.5	14.2
	0115	120	3.8	12.0
	0130	135	3.3	10.4
	0145	150	2.9	9.2
	0200	165	2.2	7.0
	0215	180	1.7	5.4
	0230	195	1.3	4.1
	0245	210	0.7	2.2
	0230	225	0.0	0.0

[a] Conversion: 1 in. depth = 3.16 gal.

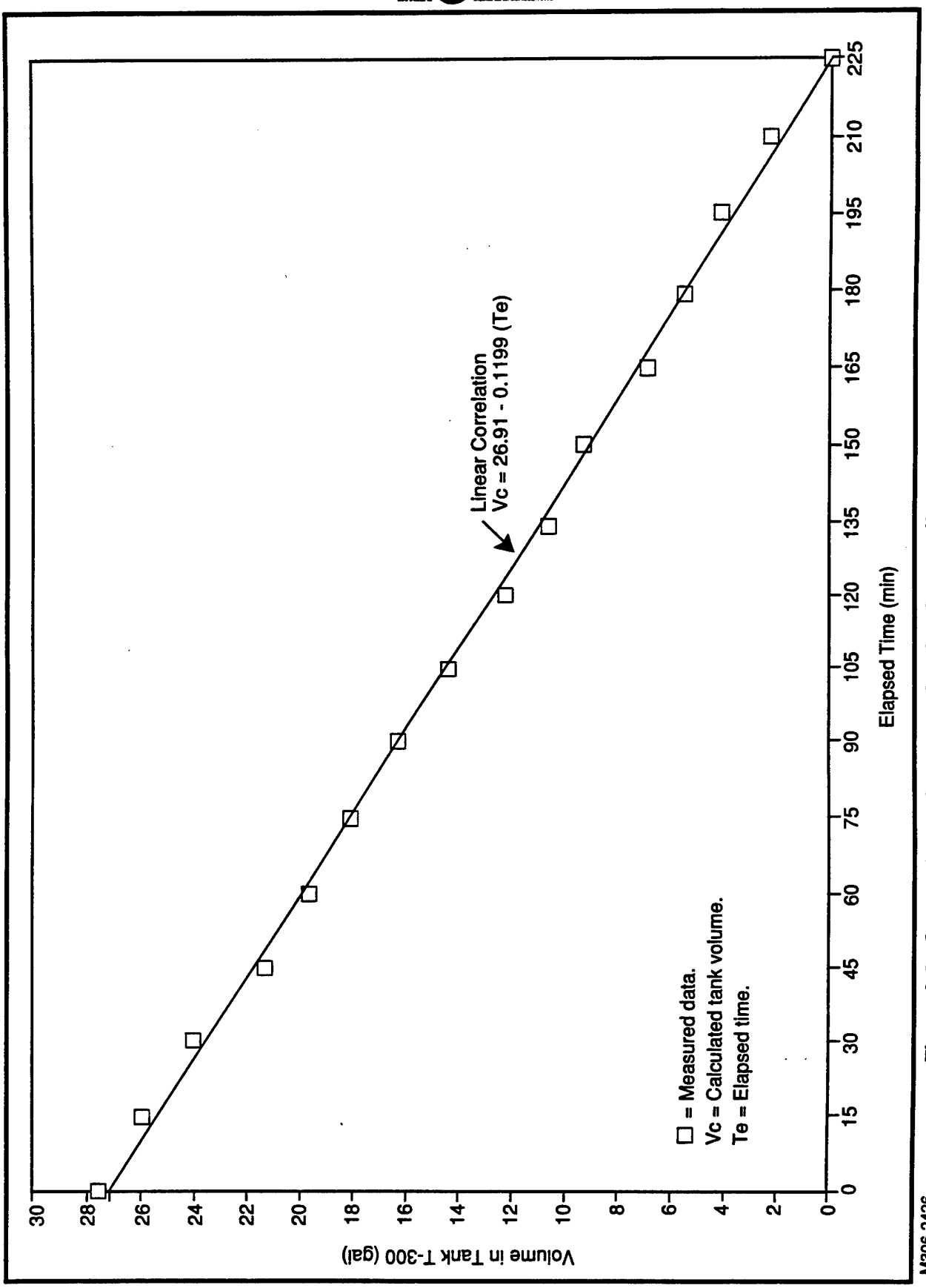


Figure 9-3. Comparison of measured tank volume to linear regression equation.

was conducted during all tests. The concentration of carbon monoxide is often used as an indicator of combustion characteristics.

A second indicator of combustion characteristics is the combustion efficiency, which is calculated as follows:

$$CE = \frac{CO_2}{CO_2 + CO} \times 100$$

Where:

CE = Combustion efficiency (%).
CO_2 = Concentration of carbon dioxide (%).
CO = Concentration of carbon monoxide (%).

The average values measured during each of the test phases are summarized in Table 9-5. Complete data from the CEM system are provided in Appendix C. The data from part b of Test T-9 was divided into two separate groups. Test T-9b(1) is a summary of data collected from 11:45 to 14:29 on 29 November 1990, and Test T-9b(2) is a summary of data collected from 14:30 to 15:18 on 29 November 1990. The data are broken into these two groups because the explosives solution was burned independently during Test T-9b(1) and was cofired with fuel oil during Test T-9b(2).

A bar graph depicting the combustion efficiency for each test is provided in Figure 9-4. For the tests conducted without explosives or significant quantities of explosives, the combustion efficiencies were all above 99.9%, indicating excellent combustion. The results from Test T-9 are all low and indicative of poor combustion.

9.1.7 Combustion efficiency correlations. A plot of combustion efficiency versus oxygen concentration in the stack gases is provided in Figure 9-5.

9.1.8 Combustion efficiency regulations. The emission of carbon monoxide is proposed to be regulated under the RCRA authority as discussed in Subsection 9.1.3. The proposed limit for carbon monoxide is a maximum of 100 ppm/vol based on a 60-min rolling average. The emissions of CO from the boiler when firing fuel oil or dilute explosives solution were below the proposed limit. However, as shown in Table 9-5, the CO emission rate during Test T-9 was significantly higher than the proposed limit. The cause of the high CO emissions during Test T-9 must be determined and solved if the boiler is to comply with the proposed RCRA regulations.

9.1.9 Background nitrous oxide emission results. The emission of nitrous oxides (NO_x) was monitored by the CEM system. The emissions of NO_x include nitrogen oxide (NO) and nitrogen dioxide

Table 9-5. Summary of average data for CO_2, CO, and O_2 as measured by the CEM system.

Test Number	Parameter Concentrations			
	CO_2 (%)	CO (ppm)	O_2 (%)	Combustion Efficiency (%)
T-1a	10.7	42.7	6.5	99.960
T-1b	8.7	63.0	9.3	99.928
T-1c	12.1	13.6	5.0	99.989
T-2	11.3	47.0	5.7	99.958
T-3	11.6	49.5	6.6	99.957
T-5	10.4	28.7	7.2	99.972
T-9a	11.7	357.2	4.8	99.696
T-9b(1)	14.5	479.0	3.3	99.671
T-9b(2)	12.3	395.5	4.5	99.679
T-9c	11.5	295.1	5.0	99.744

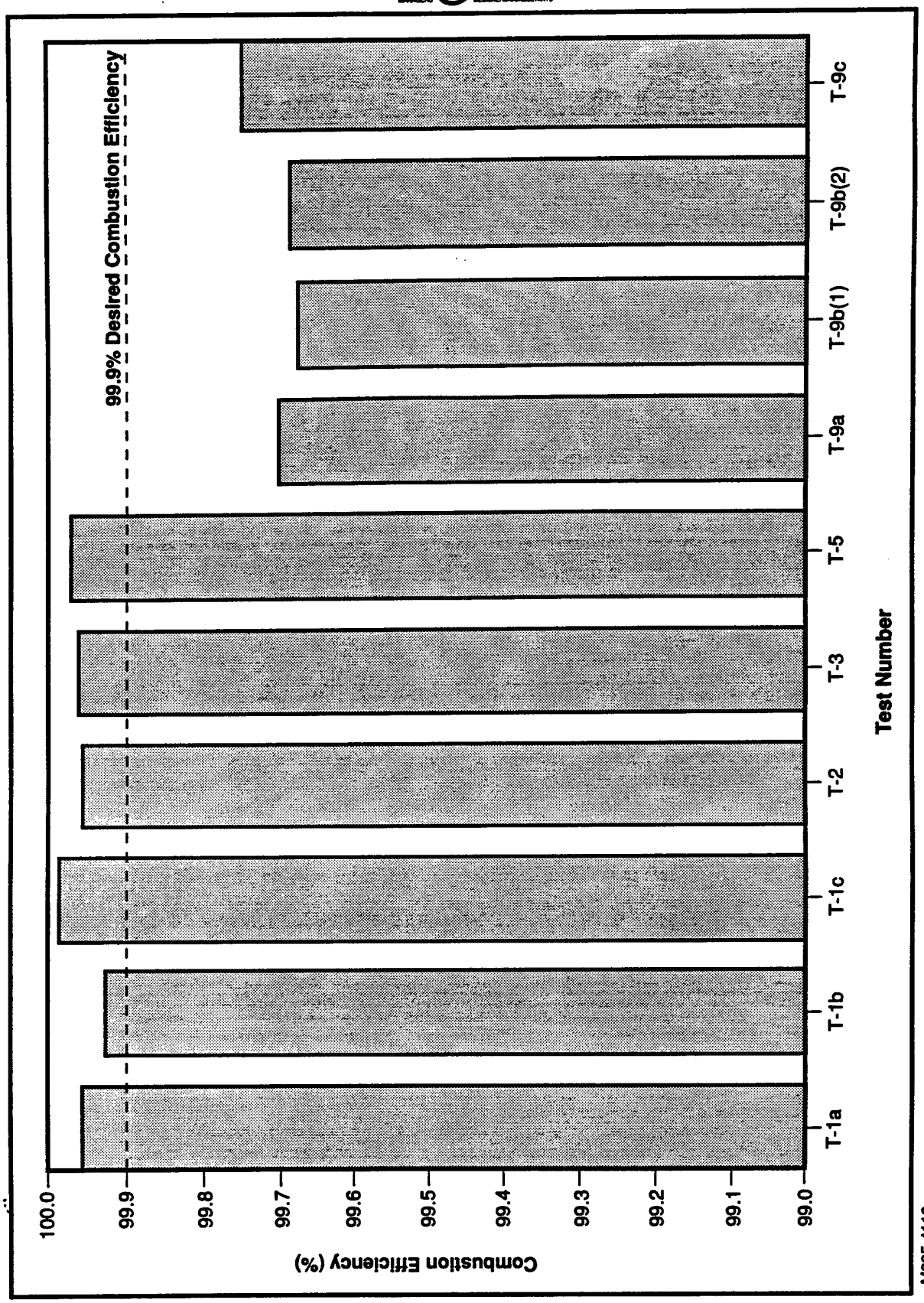


Figure 9-4. Combustion efficiency.

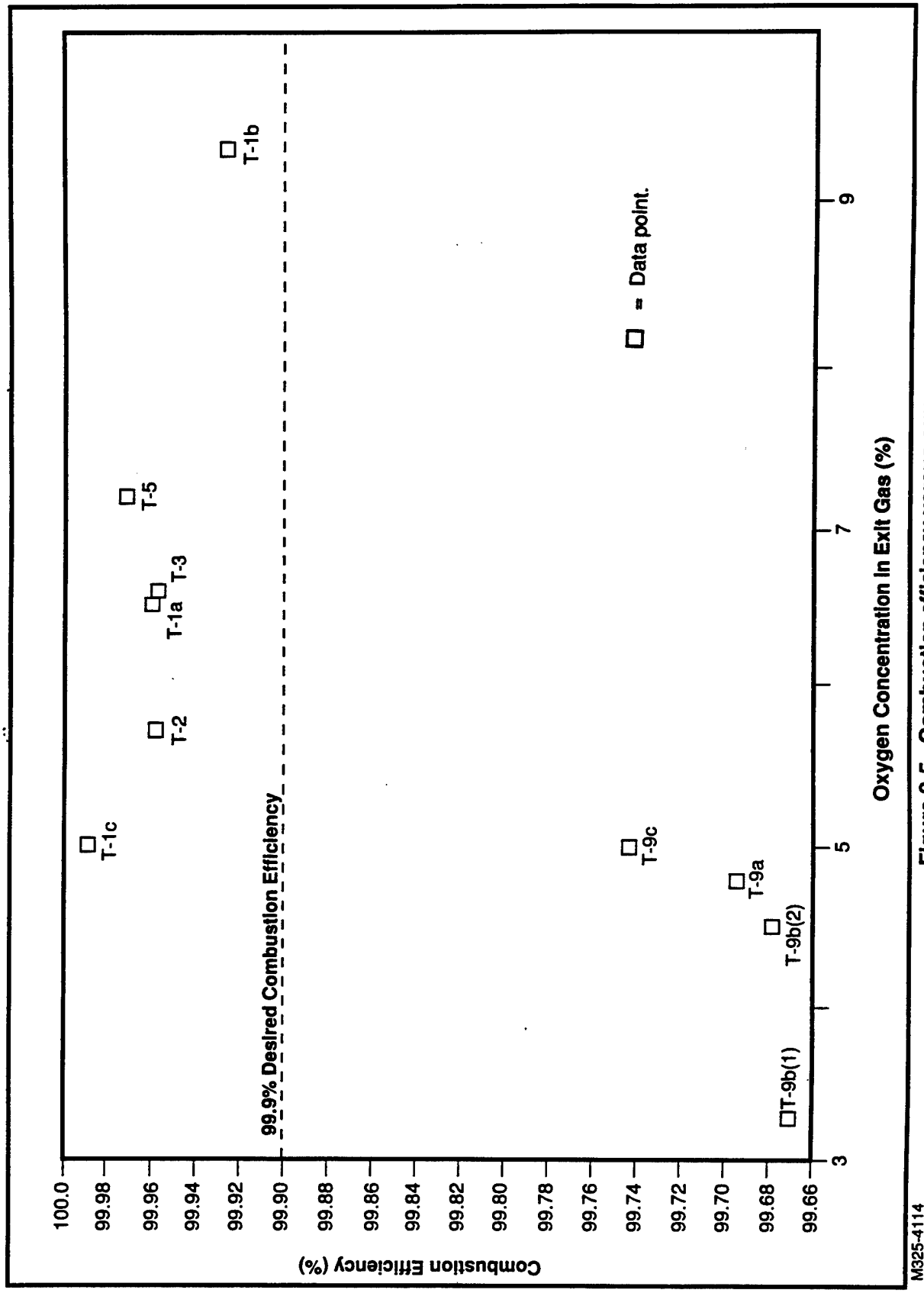


Figure 9-5. Combustion efficiency versus oxygen.

(NO_2). These compounds are collectively analyzed and reported as NO_2 equivalents.

The data collected in Phase I of the testing were analyzed to establish a base line NO_x generation curve for the boiler as it burns fuel oil. The 5-sec snapshot data from Tests T-1b, T-1c, T-2, and T-3 were compiled into 1-min averages. (Data from Test T-1a were not included because the burner nozzle size was changed and the burn characteristics were not considered similar.) A linear regression of the more than 700 data points was completed. The developed correlation curve was defined by the equation:

$$C_{NO_x} = (-11.55 \times C_{O_2}) + 152.3$$

Where:

C_{NO_x} = Concentration of NO_x (ppm).
C_{O_2} = Concentration of O_2 (%).

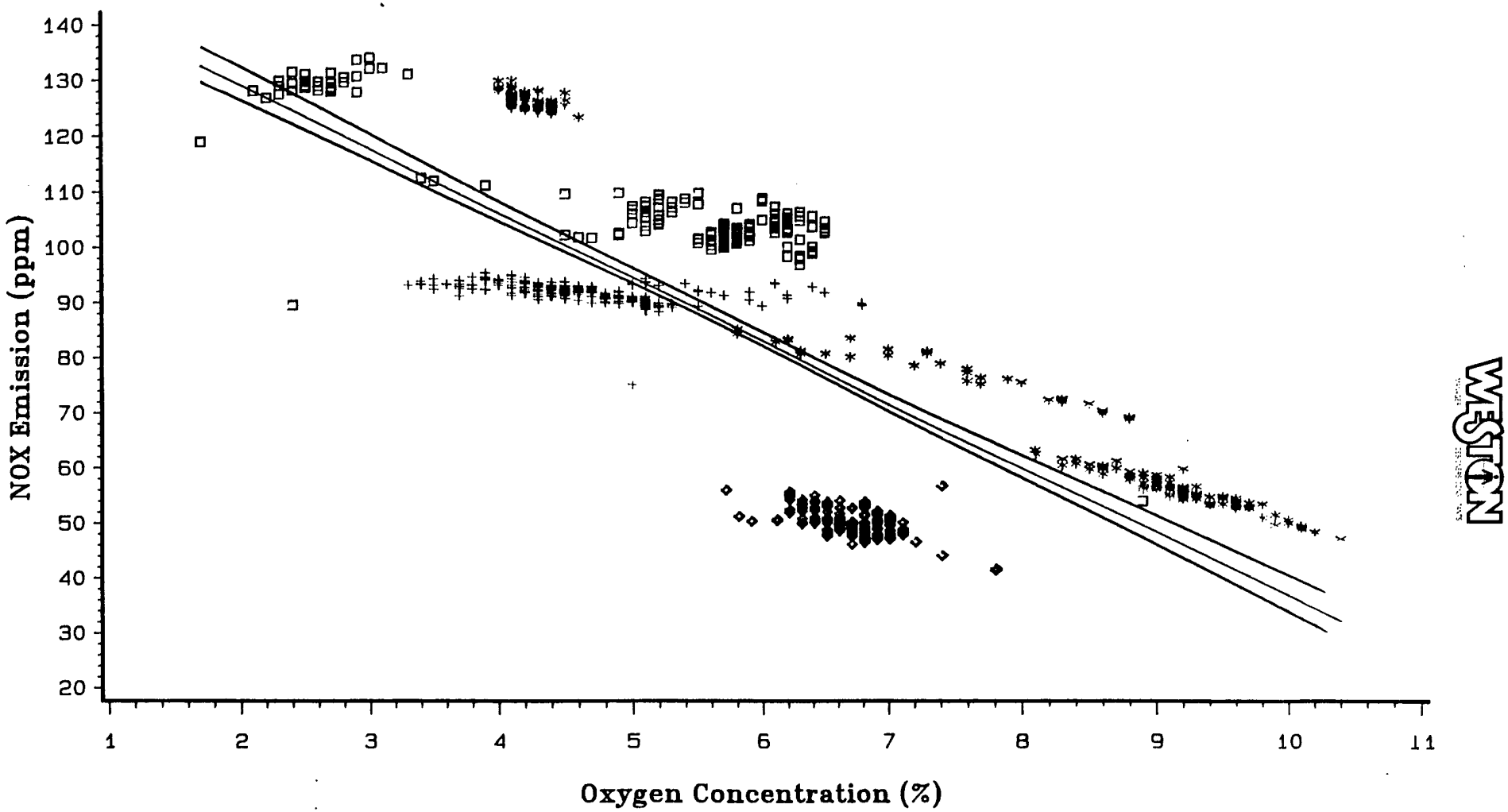
The coefficient of determination (R^2) for the equation was 57%.

A comparison of the 1-min average NO_x data points with the linear regression curve is presented in Figure 9-6. The data collected during the background tests and the trending as displayed by the linear correlations are consistent with typical boiler operations. The formation of NO_x was found to increase as the oxygen concentration in the combustion products decreased. NO_x is formed from the nitrogen contained in the fuel and the combination of N_2 in air with oxygen. The nitrogen and oxygen combined to form NO_x only at high temperatures. As the oxygen in the stack gas is reduced, the flame temperature increases and the formation of NO_x is increased.

9.1.10 Nitrous oxide emissions with TNT. NO_x emission rates were elevated during the burns conducted with TNT solutions. Figures 9-7, 9-8, 9-9, and 9-10 provide plots of the data from Tests T-5, T-9a, T-9b, and T-9c relative to the linear regression for nonexplosives boiler operations.

The data from Test T-5, which were collected during the cofiring of a 1% TNT solution with fuel oil, are similar in characteristics to the nonexplosives testing data. Figure 9-7 contains data points and a linear correlation of NO_x versus oxygen for Test T-5. The NO_x concentrations are approximately 50 to 100 ppm above the concentrations measured during nonexplosives testing. A mass balance was completed and determined that 40 to 60% of the nitrogen contained in the TNT is emitted as NO_x.

The test data from Test T-9 are divided into three major segments. Test T-9a involved a solution of TNT and acetone cofired with fuel oil. The supply of solution was erratic, and the data plotted in Figure 9-8 show that the oxygen content varied greatly from 0 to 9%. The NO_x generated was quite high, in some cases 50



star = test1b data
plus = test1c data
square = test2 data
diamond = test3 data

Figure 9-6. NO_X versus oxygen with 95% confidence bounds.

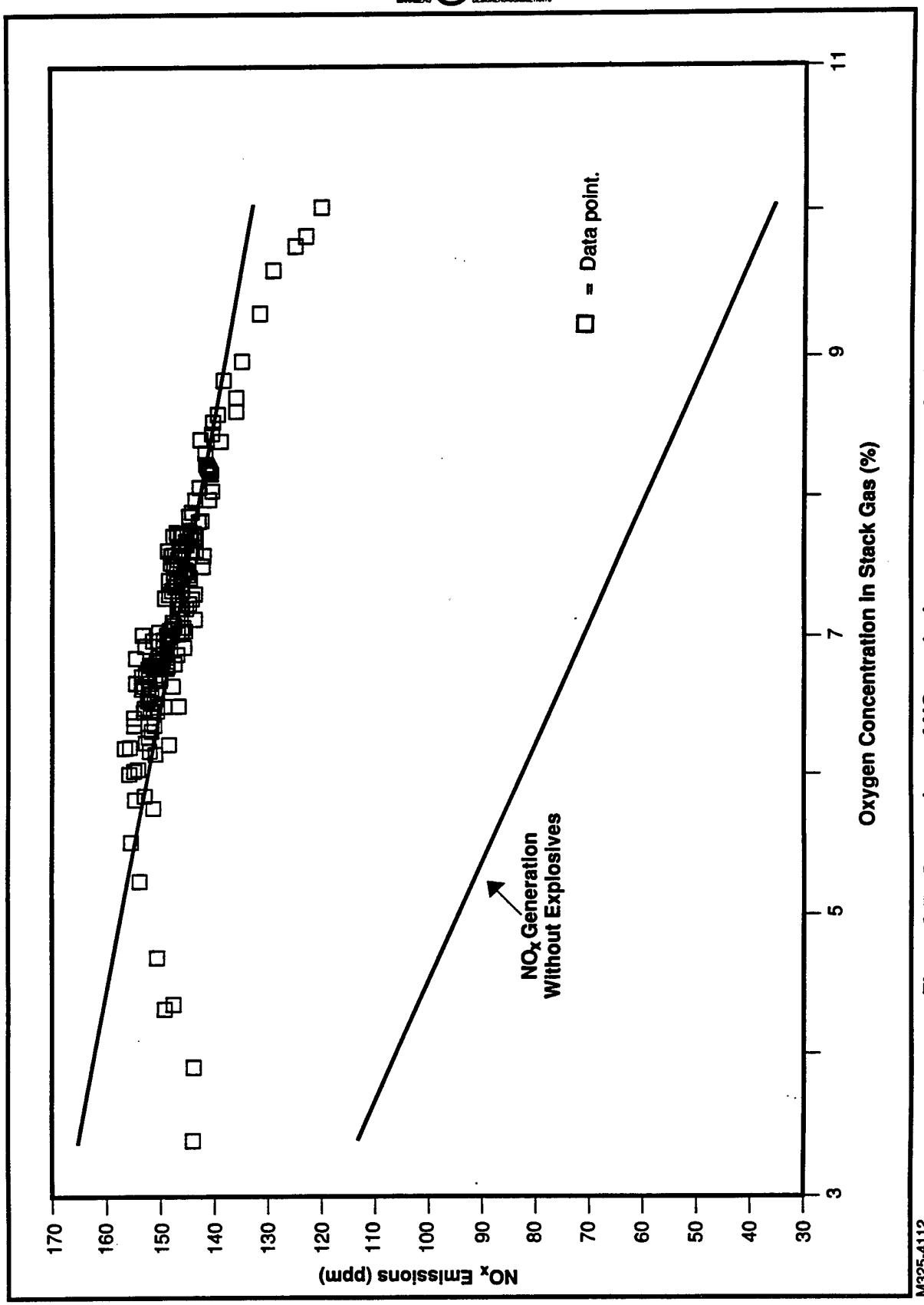


Figure 9-7. Comparison of NO_x emissions versus oxygen for Test T-5.

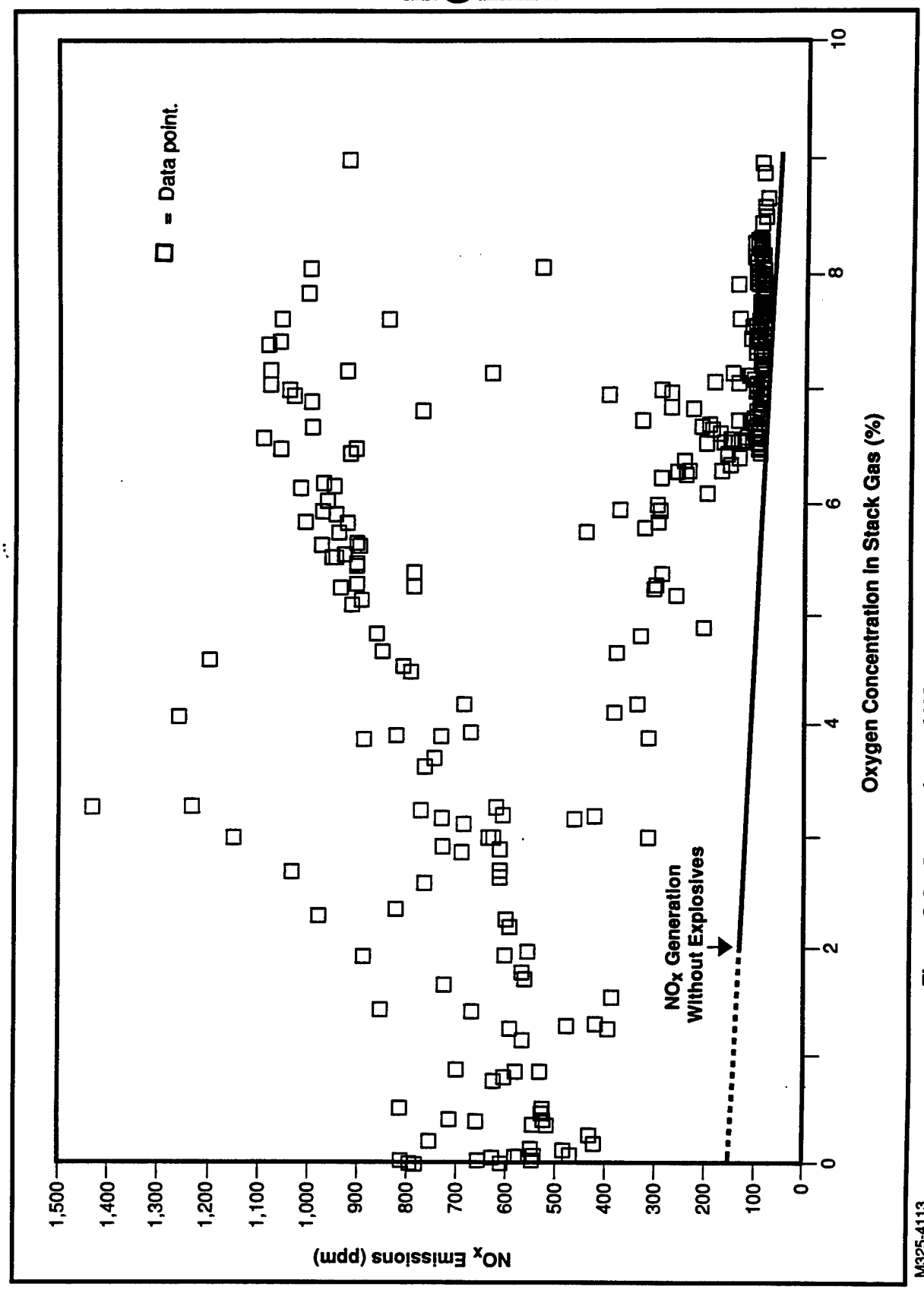


Figure 9-8. Comparison of NO_x emissions versus oxygen for Test T-9a.

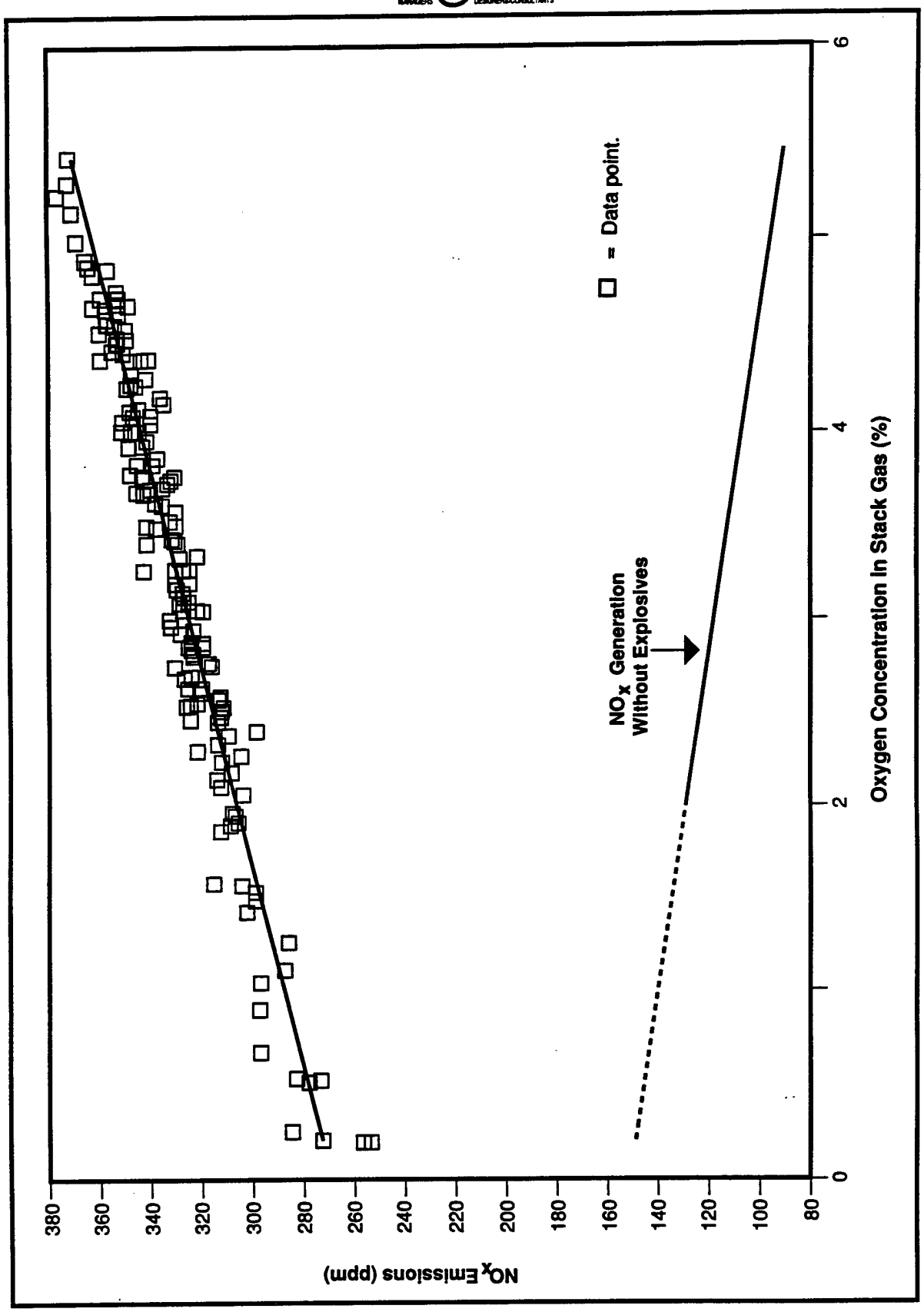


Figure 9-9. Comparison of NO_x emissions versus oxygen for Test T-9b.

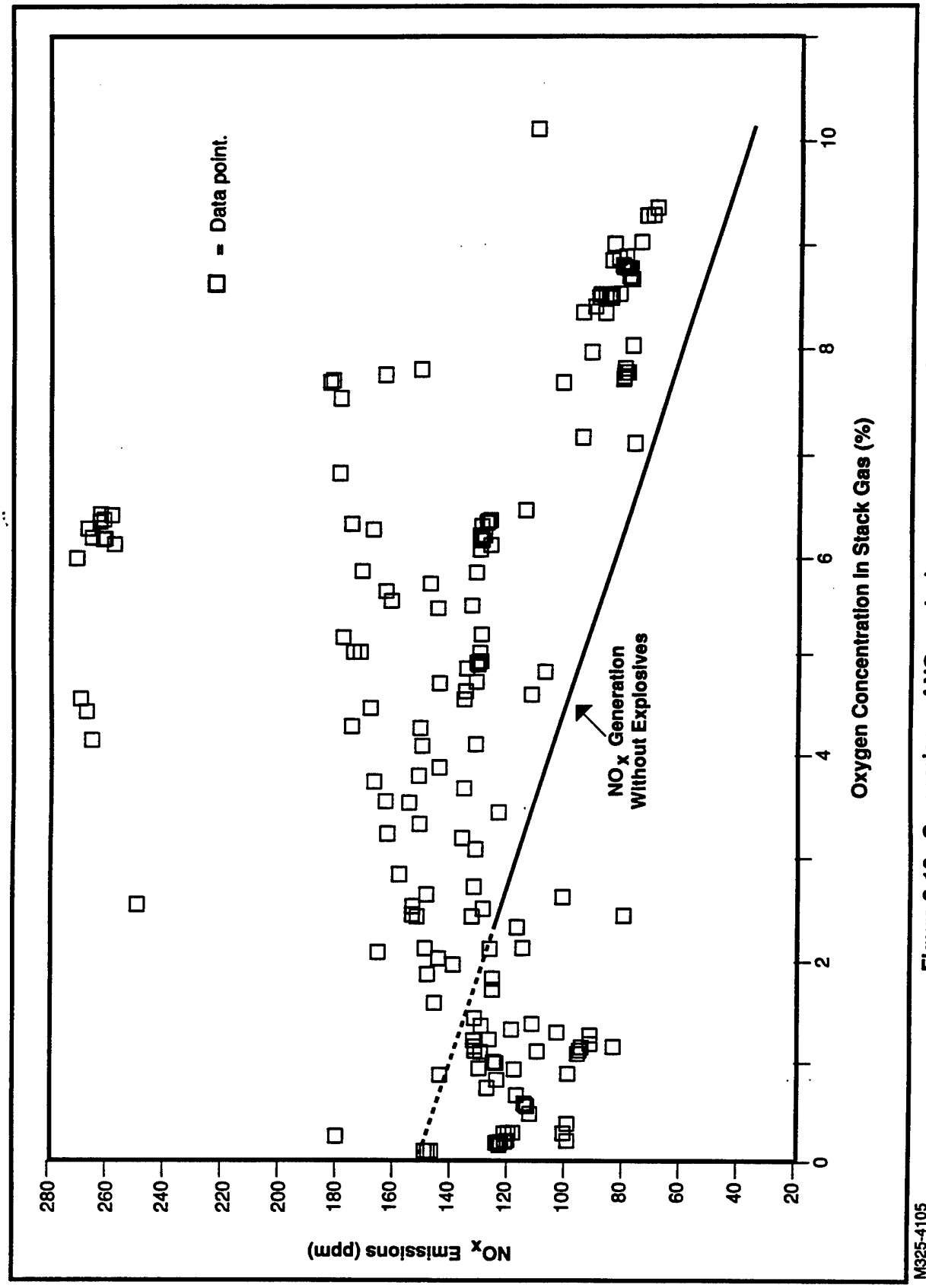


Figure 9-10. Comparison of NO_x emissions versus oxygen for Test T-9c.

to 100 times higher than that shown in the nonexplosives data. The data generated when the oxygen level is near 7% approaches the nonexplosives cases. This is believed to be caused by the loss of flow of explosives solution.

The second set of test data from Test T-9 (T-9b) was generated when a fuel oil, toluene, acetone, and TNT solution was fired. The data were collected in Test T-9b(1) when the boiler was fired with only the explosives solution. The data points and a linear correlation are shown relative to a nonexplosives test in Figure 9-9. The data are unique in that they represent a reversal of the NO_x and oxygen data. NO_x increases with oxygen concentration during the test. The operation of the boiler was different than the base line and other explosives testing because it was one of the few times during the testing that only explosives solution was fired.

The final set of test data (Test T-9c) was also produced from a solution containing TNT, fuel oil, acetone, and toluene. The data are shown in Figure 9-10. During Test T-9c, the solution was cofired with fuel oil. There was no clear trend in the NO_x levels. The operation did generate some spikes up to 260 ppm; however, in general, the NO_x generated was comparable to the nonexplosives data.

9.1.11 Nitrous oxide emission regulations. The emission rate of NO_x from industrial, commercial, or institutional steam-generating units is regulated under 40 CFR 60, Subpart Db. As outlined in the regulations, steam-generating units (i.e., boilers) with a thermal rating >100 million Btu/hr and firing No. 2 fuel oil containing >0.05% nitrogen (residual oil) must meet the following NO_x emission criteria:

- <0.30 lb NO_x/million Btu of heat input if the heat release rate is <70,000 Btu/hr ft^3, or
- <0.40 lb NO_x/million Btu of heat input if the heat release rate is >70,000 Btu/hr ft^3.

The heat release of the boiler was 83,682 Btu/hr ft^3 based on the boiler heat input rating of 2,000,000 Btu/hr and an internal volume of 23.9 ft^3. A comparison of NO_x emission rates from each test to the regulation is provided in Table 9-6. While firing fuel oil only, the boiler complied with the applicable regulation. The boiler did not comply with the regulation when firing TNT solutions. NO_x emissions above the stated regulations can be allowed on a case-by-case basis; 40 CFR 60.44(s) does allow EPA to grant a waiver from the NO_x criteria if the boiler is firing hazardous waste under RCRA or the Toxic Substances Control Act (TSCA) permits.

9.1.12 Products of incomplete combustion. During hazardous waste incineration, principal organic constituents (i.e., TNT) do not completely convert into simple gaseous products such as carbon

Table 9-6. Summary of boiler NO_x emission rates.

Test Number	NO_x Concentration (ppm/vol)	NO_x Emission Rate (lb/hr)	Burner Heat Release (Btu/hr)	NO_x Emission Rate (lb/million Btu)
T-1a	108.8	0.30	1,511,000	0.198
T-1c	95.6	0.25	1,570,000	0.154
T-2	105.2	0.32	2,084,000	0.154
T-3	51.3	0.15	2,046,000	0.073
T-5	156.4	0.50	1,600,000	0.312
T-9a	490.7	1.43[a]	1,790,000[b]	0.797
T-9b	328.8	0.96[a]	1,901,000[b]	0.503
T-9c	127.8	0.37	1,830,000[b]	0.203

[a]Calculated assuming 1ppm/vol = 0.002907 lb/hr.
[b]Heat release calculated is lowest estimate for test.

dioxide and water vapor. Trace amounts of more complex molecular structures will remain. These more complex products are collectively referred to as products of incomplete combustion (PICs). The stack samples collected for explosives analysis during Test T-5 were screened visually for the presence of nontarget compounds. (Target compounds were TNT and RDX.) The sample contained approximately five to six major components. The compounds detected were at a concentration comparable to TNT (i.e., ppb/vol). The compounds eluted in the chromatogram at the approximate location where single-ring nitroaromatic compounds would elute. No definitive qualification was possible for the observed data.

9.2 Boiler efficiency and operation. A large volume of data was collected from the process instruments on the feed system and boiler. These data were collected to complete detailed heat and mass balances on the boiler and to determine how the burning of explosives solution affected the boiler efficiency.

9.2.1 Fuel oil. The fuel oil fired in the boiler and mixed to form the explosives solution was supplied by the Hawthorne Army Ammunition Plant. A sample was collected and analyzed to determine its elemental composition and heating value. The analysis is provided in Table 9-7. The fuel is typical of a No. 2 fuel oil. Because the nitrogen content of the fuel exceeded 0.05%, the fuel is classified as a residual oil for calculation of nitrous oxide emissions.

To ensure complete combustion of the fuel oil during boiler operations, air is supplied in excess of the stoichiometric requirement. The quantity of air above the stoichiometric requirement is referred to as excess air. The formula for calculating excess air is as follows:

$$XS = \frac{M_{act} - M_{sto}}{M_{act}} \times 100\%$$

Where:

XS = Excess air (%).

M_{act} = Mass of combustion air actual (lb/lb fuel).

M_{sto} = Mass of combustion air stoichiometric (lb/lb fuel).

The process instrumentation on the boiler system measured the oxygen concentration on a dry volume basis, not as an excess air percentage. For the fuel oil burned at Hawthorne Army Ammunition Plant, Table 9-8 was created for converting excess air percentages to the measurable oxygen concentrations.

Table 9-7. Summary of fuel oil analysis.

Analysis	Method	Value
Carbon	ASTM[a] D3178	86.09%
Hydrogen	ASTM D3178	13.60%
Nitrogen	ASTM D3228	0.25%
Sulfur	ASTM D129	0.27%
Ash	ASTM D482	<5ppm
Heating Value	ASTM D240	19.675 Btu/lb
Specific Gravity	ASTM D1298	0.8625 at 25°C
Viscosity		3.96 CS at 25°C

[a]American Society of Testing Materials.

Table 9-8. Excess air to exit gas oxygen conversion table.

Excess Air (%)	Exit Gas Oxygen (% vol, dry basis)
0	0.00
5	1.06
10	2.01
15	2.88
20	3.67
25	4.40
30	5.06
35	5.68
40	6.25
45	6.77
50	7.27
55	7.72
60	8.15
65	8.55
70	8.93
75	9.29
80	9.63
85	9.94
90	10.23
95	10.52
100	10.78

9.2.2 Heat and mass balances. Data from the boiler control panel were logged on a personal computer every 5 sec. The information was averaged over the length of each test. Table 9-9 provides a summary of the data collected for each test. On Table 9-9, the minimum, maximum, average, standard deviation, and standard deviation as a percentage of the average are provided.

Mass balance calculations were completed for Tests T-1a, T-1c, T-2, T-3, and T-5. (Measurement of the explosives solution flow rate could not be calculated for Test T-1b.) In each case, the flow of explosives solution to the boiler was calculated based on the loss in volume in Tank T-300. The calculated rate of exhaust gases was compared to the actual measurements made during stack sampling. The closure error for the mass balance is defined by the equation:

$$\text{Closure error} = \frac{Qm - Qc}{Qm} \times 100\%$$

Where:

Qm = Measured stack exit gas volume (dscfm).
Qc = Calculated stack exit gas volume (dscfm).

For the five mass balances, the closure error ranged from 0.3% to 28%. The 28% case was calculated during Test T-1c. The other closure errors were all <14%.

Similarly, heat balance calculations were completed for Tests T-1a, T-1b, T-2, T-3, and T-5. The closure error for heat balance is defined by the equation:

$$\text{Closure error} = \frac{H_{in} - H_{out}}{H_{in}} \times 100\%$$

Where:

H_{in} = Heat input from fuel (Btu/hr).
H_{out} = Heat output (Btu/hr).

Heat input is the sum of heat supplied to the boiler from the explosives solution and fuel oil if the explosives solution was cofired. The heat output is the sum of heat losses and consists of the following components:

- Heat to steam.
- Sensible heat lost in stack gas.
- Enthalpy to evaporate water vapor in stack gases.
- Sensible heat to combustion air.
- Radiation losses.

Table 9-9. Summary of process operating data.

Test T-1a					
Data Type (unit)	Minimum	Maximum	Average	Standard Deviation	Standard Deviation as a Percentage of Average (%)
Steam Flow (lb/hr)	1,415	1,718	1,594	87	5.5
Steam Pressure (psig)	3.96	6.98	5.51	0.93	16.8
Steam Temperature (°F)	220	228	224	2	1.1
Stack Temperature (°F)	598	603	600	2	0.3
Compressed Air Pressure (psig)	54.3	56.1	55.3	0.5	1.0
Feed Water Flow (gpm)	-5.0	-5.0	-5.0	0.0	0.0
Feed Water Temperature (°F)	81.8	129.6	91.2	13.1	14.4
Feed Water Pressure (psig)	1.0	8.4	4.1	2.8	69.8
Feed Water Level (in.)	11.7	12.8	12.3	0.4	3.1
Fuel Oil Flow (gph)	-0.3	-0.2	-0.2	0.0	-0.5
Fuel Oil Pressure (psig)	-1.2	-1.0	-1.1	0.0	-4.0
Explosives Solution Flow (gph)	11.2	11.3	11.2	0.0	0.2
Explosives Solution Pressure (psig)	12.69	13.12	12.91	0.13	1.0
Explosives Solution Viscosity (cps)	0.84	1.41	1.04	0.17	16.7
Explosives Solution Density (% solids)	0.2	0.3	0.2	0.0	14.7
Combustion Air Flow (cfm)	361	390	377	6	1.6

Table 9-9
(continued)

Test T-1b					
Data Type (unit)	Minimum	Maximum	Average	Standard Deviation	Standard Deviation as a Percentage of Average (%)
Steam Flow (lb/hr)	-6	1,664	1,133	447	39.4
Steam Pressure (psig)	0.0	9.0	2.3	1.7	75.2
Steam Temperature (°F)	206	233	214	5	2.4
Stack Temperature (°F)	339	666	524	61	11.6
Compressed Air Pressure (psig)	55.8	80.2	57.2	2.0	3.5
Feed Water Flow (gpm)	0.0	5.3	1.1	1.8	161.2
Feed Water Temperature (°F)	72.7	104.8	88.2	8.7	9.9
Feed Water Pressure (psig)	0.9	10.2	1.8	1.6	87.0
Feed Water Level (in.)	11.5	14.4	12.8	0.6	4.7
Fuel Oil Flow (gph)	0.0	15.5	1.2	3.4	289.6
Fuel Oil Pressure (psig)	-1.2	11.5	0.1	2.9	4,526.8
Explosives Solution Flow (gph)	-0.2	21.0	13.7	5.7	41.5
Explosives Solution Pressure (psig)	-0.3	65.1	18.2	8.5	46.7
Explosives Solution Viscosity (cps)	0.6	1.4	0.9	0.2	21.3
Explosives Solution Density (% solids)	3.4	9.1	4.4	0.8	17.5
Combustion Air Flow (cfm)	-12	651	49	124	253.7

Table 9-9
(continued)

Test T-1c					
Data Type (unit)	Minimum	Maximum	Average	Standard Deviation	Standard Deviation as a Percentage of Average (%)
Steam Flow (lb/hr)	1,490	1,585	1,551	19	1.2
Steam Pressure (psig)	3.2	7.7	5.5	1.1	20.1
Steam Temperature (°F)	216	230	223	3	1.4
Stack Temperature (°F)	590	608	599	4	0.8
Compressed Air Pressure (psig)	57.2	58.9	58.1	0.5	0.8
Feed Water Flow (gpm)	0.0	3.8	1.2	1.3	111.4
Feed Water Temperature (°F)	71.4	72.5	72.1	0.3	0.4
Feed Water Pressure (psig)	1.0	8.8	3.6	2.9	79.4
Feed Water Level (in.)	10.8	12.2	11.5	0.4	3.3
Fuel Oil Flow (gph)	0.1	0.1	0.1	0.0	3.0
Fuel Oil Pressure (psig)	-0.2	0.1	0.0	0.1	-113.1
Explosives Solution Flow (gph)	12.0	13.1	12.6	0.3	2.2
Explosives Solution Pressure (psig)	30.0	33.2	31.7	0.9	2.9
Explosives Solution Viscosity (cps)	0.6	0.8	0.7	0.0	4.3
Explosives Solution Density (% solids)	0.6	1.8	0.9	0.3	34.8
Combustion Air Flow (cfm)	99	168	135	15	11.1

Table 9-9
(continued)

Test T-2					
Data Type (unit)	Minimum	Maximum	Average	Standard Deviation	Standard Deviation as a Percentage of Average (%)
Steam Flow (lb/hr)	1,457	1,881	1,660	125	7.5
Steam Pressure (psig)	7.0	11.7	9.0	1.5	16.9
Steam Temperature (°F)	228	240	233	4	1.6
Stack Temperature (°F)	633	642	638	3	0.5
Compressed Air Pressure (psig)	56.3	58.2	57.3	0.5	0.9
Feed Water Flow (gpm)	-5.0	-5.0	-5.0	0.0	0.0
Feed Water Temperature (°F)	108.9	123.4	114.1	3.9	3.5
Feed Water Pressure (psig)	0.9	11.6	6.3	4.3	67.8
Feed Water Level (in.)	12.0	15.7	13.2	1.1	8.7
Fuel Oil Flow (gph)	-0.3	-0.2	-0.2	0.0	-0.6
Fuel Oil Pressure (psig)	-1.2	-0.9	-1.1	0.1	-6.4
Explosives Solution Flow (gph)	12.0	12.2	12.1	0.0	0.3
Explosives Solution Pressure (psig)	50.5	51.9	51.1	0.4	0.8
Explosives Solution Viscosity (cps)	0.6	1.0	0.8	0.1	12.9
Explosives Solution Density (% solids)	0.1	0.6	0.2	0.1	56.4
Combustion Air Flow (cfm)	481	501	489	4	0.7

Table 9-9
(continued)

Data Type (unit)	Test T-3 Minimum	Maximum	Average	Standard Deviation	Standard Deviation as a Percentage of Average (%)
Steam Flow (lb/hr)	1,084	1,840	1,496	194	13.0
Steam Pressure (psig)	2.2	7.4	5.1	1.5	29.2
Steam Temperature (°F)	214	229	223	4	1.8
Stack Temperature (°F)	641	663	652	5	0.8
Compressed Air Pressure (psig)	57.5	59.2	58.4	0.5	0.9
Feed Water Flow (gpm)	-5.0	-5.0	-5.0	0.0	-0.2
Feed Water Temperature (°F)	70.3	85.7	74.7	4.3	5.8
Feed Water Pressure (psig)	1.0	8.0	3.0	2.3	79.2
Feed Water Level (in.)	11.2	13.4	12.4	0.6	4.7
Fuel Oil Flow (gph)	-0.1	-0.1	-0.1	0.0	-4.8
Fuel Oil Pressure (psig)	1.0	1.6	1.2	0.2	12.4
Explosives Solution Flow (gph)	10.2	11.2	10.6	0.2	2.2
Explosives Solution Pressure (psig)	10.9	12.9	11.7	0.4	3.8
Explosives Solution Viscosity (cps)	0.3	0.4	0.3	0.0	9.4
Explosives Solution Density (% solids)	-3.3	5.7	0.7	0.8	117.5
Combustion Air Flow (cfm)	373	464	417	20	4.8

Table 9-9
(continued)

Test T-5					
Data Type (unit)	Minimum	Maximum	Average	Standard Deviation	Standard Deviation as a Percentage of Average (%)
Steam Flow (lb/hr)	933	1,678	1,540	123	8.0
Steam Pressure (psig)	1.2	10.3	5.1	2.0	38.8
Steam Temperature (°F)	211	235	222	6	2.5
Stack Temperature (°F)	626	685	658	15	2.2
Compressed Air Pressure (psig)	57.8	58.5	58.1	0.3	0.4
Feed Water Flow (gpm)	0.0	4.6	1.3	1.5	115.2
Feed Water Temperature (°F)	68.3	69.1	68.8	0.2	0.3
Feed Water Pressure (psig)	0.9	11.3	3.4	2.9	83.5
Feed Water Level (in.)	10.8	12.3	11.6	0.4	3.6
Fuel Oil Flow (gph)	3.8	12.2	4.5	1.4	31.5
Fuel Oil Pressure (psig)	3.7	9.3	4.2	1.0	23.6
Explosives Solution Flow (gph)	0.4	8.5	7.0	1.2	17.5
Explosives Solution Pressure (psig)	2.9	52.5	43.7	6.9	15.9
Explosives Solution Viscosity (cps)	0.7	0.9	0.8	0.1	7.7
Explosives Solution Density (% solids)	0.1	0.1	0.1	0.0	2.2
Combustion Air Flow (cfm)	400	568	524	33	6.2

Table 9-9
(continued)

Test T-9a					
Data Type (unit)	Minimum	Maximum	Average	Standard Deviation	Standard Deviation as a Percentage of Average (%)
Steam Flow (lb/hr)	1,383	2,012	1,633	117	7.1
Steam Pressure (psig)	2.5	13.3	8.1	2.1	26.1
Steam Temperature (°F)	214	242	230	5	2.4
Stack Temperature (°F)	585	772	668	56	8.4
Compressed Air Pressure (psig)	54.0	57.6	55.9	0.7	1.3
Feed Water Flow (gpm)	0.1	4.2	1.3	1.2	88.4
Feed Water Temperature (°F)	71.0	77.4	74.7	1.4	1.8
Feed Water Pressure (psig)	0.9	14.6	5.1	4.1	79.4
Feed Water Level (in.)	10.9	12.2	11.6	0.3	3.0
Fuel Oil Flow (gph)	0.0	12.3	8.9	3.0	34.3
Fuel Oil Pressure (psig)	0.2	10.0	7.2	2.2	30.2
Explosives Solution Flow (gph)	-0.2	21.0	10.9	7.7	70.1
Explosives Solution Pressure (psig)	-1.2	28.8	2.4	4.4	179.8
Explosives Solution Viscosity (cps)	9.0	12.8	11.5	0.7	6.3
Explosives Solution Density (% solids)	-7.5	0.1	-0.3	1.6	-534.4
Combustion Air Flow (cfm)	266	521	433	47	10.9

Table 9-9
(continued)

Data Type (unit)	Test T-9b Minimum	Maximum	Average	Standard Deviation	Standard Deviation as a Percentage of Average (%)
Steam Flow (lb/hr)	1,780	2,052	1,862	66	3.5
Steam Pressure (psig)	6.4	12.0	9.4	1.1	11.3
Steam Temperature (°F)	227	239	234	3	1.1
Stack Temperature (°F)	626	721	702	13	1.8
Compressed Air Pressure (psig)	56.8	58.9	57.9	0.5	0.9
Feed Water Flow (gpm)	-0.2	1.4	0.8	0.4	52.2
Feed Water Temperature (°F)	76.6	91.4	80.4	2.4	2.9
Feed Water Pressure (psig)	0.9	12.9	9.0	3.7	40.9
Feed Water Level (in.)	11.2	12.2	11.5	0.2	2.1
Fuel Oil Flow (gph)	0.0	0.0	0.0	0.0	18.3
Fuel Oil Pressure (psig)	-0.5	0.3	-0.4	0.1	-29.6
Explosives Solution Flow (gph)	15.2	20.7	18.0	1.4	8.1
Explosives Solution Pressure (psig)	5.8	7.6	6.5	0.4	5.7
Explosives Solution Viscosity (cps)	10.3	13.5	12.2	0.7	5.6
Explosives Solution Density (% solids)	0.1	0.1	0.1	0.0	2.7
Combustion Air Flow (cfm)	384	419	397	6	1.5

Table 9-9
(continued)

Test T-9c					
Data Type (unit)	Minimum	Maximum	Average	Standard Deviation	Standard Deviation as a Percentage of Average (%)
Steam Flow (lb/hr)	1,215	1,852	1,728	135	7.8
Steam Pressure (psig)	1.9	9.9	6.0	2.1	34.7
Steam Temperature (°F)	213	235	225	6	2.6
Stack Temperature (°F)	677	828	760	44	5.7
Compressed Air Pressure (psig)	55.8	60.3	58.6	1.2	2.1
Feed Water Flow (gpm)	-0.2	2.5	0.9	0.8	87.9
Feed Water Temperature (°F)	61.9	79.8	64.2	3.6	5.6
Feed Water Pressure (psig)	0.9	10.8	5.0	3.3	65.8
Feed Water Level (in.)	10.8	11.9	11.4	0.3	2.5
Fuel Oil Flow (gph)	6.6	11.3	9.1	1.4	15.7
Fuel Oil Pressure (psig)	5.8	9.6	7.6	1.1	14.5
Explosives Solution Flow (gph)	0.0	21.0	12.2	6.8	56.1
Explosives Solution Pressure (psig)	-1.2	12.5	3.1	3.6	113.1
Explosives Solution Viscosity (cps)	9.5	12.9	11.5	0.9	8.1
Explosives Solution Density (% solids)	0.2	30.4	18.2	10.5	57.7
Combustion Air Flow (cfm)	288	522	417	40	9.6

For the five heat balances, the closure errors ranged from 1.5% to 15.6%, which are similar in magnitude to the mass balance results.

9.2.3 Boiler efficiency. The operation of a boiler is often evaluated based on the boiler efficiency. Boiler efficiency is defined by the equation:

$$BE = \frac{H_{steam}}{H_{in}} \times 100\%$$

Where:

H_{steam} = Heat converted to steam (Btu/hr).
H_{in} = Heat input from fuel (Btu/hr).

A summary of the boiler efficiencies for all tests is provided in Table 9-10. The boiler efficiency measured during tests conducted with explosives are comparable to the nonexplosives background tests.

9.3 Feed system mixing and blending. The preparation of the explosives solution and delivery of a consistent solution to the boiler were the most troublesome activities during the explosives tests. Test T-5 was completed with successful mixing and blending of the explosives solution. During Test T-5, the difficulties encountered were related to mechanical operation of the circulating pump. Problems during Test T-9 were caused by the inability to dissolve and maintain the TNT in solution. This subsection discusses the solution composition and mixing methods as they relate to test observations.

9.3.1 Solution composition. The solutions prepared for the test were three component mixtures consisting of toluene, fuel oil, and TNT. The solution composition can be represented by a single point on a tertiary composition graph. Figure 9-11 is a tertiary graph illustrating the initial compositions of Tests T-5 and T-9. During the execution of Test T-9, a large quantity of the explosives did not dissolve. During the three parts of Test T-9, additional solvents (toluene and acetone) were added to dilute the TNT concentration. A sample of sample solution was collected prior to the Test T-9c burn. The analysis of Test T-9c and the compositions of the Test T-5 and T-9 mixtures are summarized on Table 9-11.

On tertiary composition graphs, boundary curves can be drawn that distinguish areas consisting of homogeneous solutions and multiphase compositions. It was a general consideration in developing the test plan to select TNT concentrations that would provide single-phase solution. During preliminary studies, the phase characterization curve that distinguished the phase boundary for an acetone, No. 2 fuel oil, and TNT mixture was completed. The boundary curve is shown in Figure 9-11. The data points for Test

Table 9-10. Summary of boiler efficiency data.

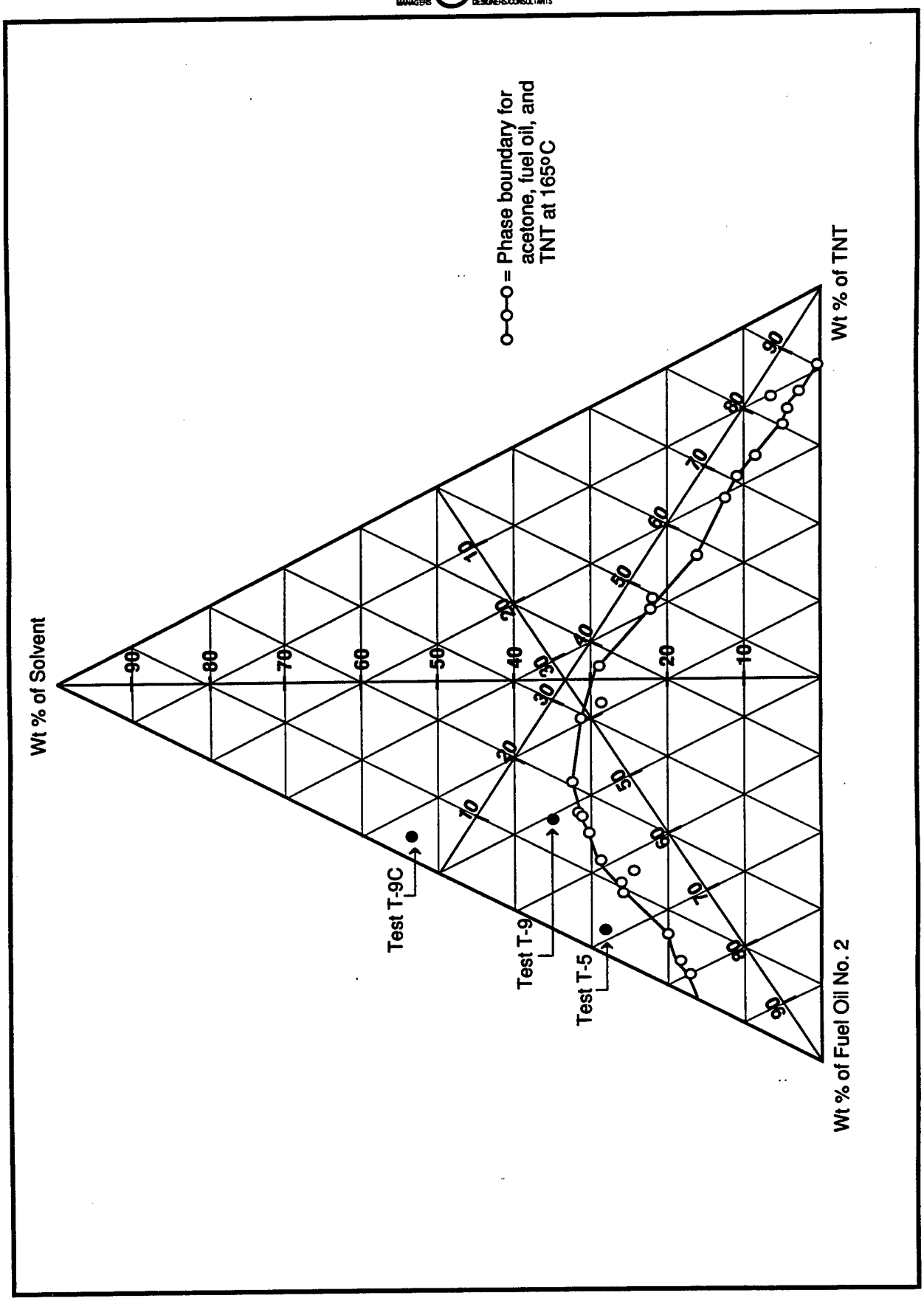
Test Number	Steam Heat (Btu/hr)	Heat Input (Btu/hr)	Boiler Efficiency (%)
T-1a	1,373,000	1,511,000	90.8
T-1c	1,359,000	1,570,000	81.4
T-2	1,535,000	2,084,000	73.7
T-3	1,308,000	2,046,000	63.9
T-5	1,470,000	1,600,000	91.9
T-9a	1,540,000	1,790,000 to 1,874,000[a]	82.1 to 86.0[a]
T-9b	1,790,000	1,901,000 to 2,176,000[a]	82.3 to 94.2[a]
T-9c	1,557,000	1,830,000 to 2,262,000[a]	68.8 to 85.1[a]

[a]Exact heat inputs and efficiencies cannot be determined because of the unknown solution heating value.

Table 9-11. Summary of explosives solution composition.

Test No.	TNT (wt %)	Solvent (wt %)	Fuel Oil (wt %)
5	1.05	28.56	70.41
9	15.6	34.1	50.3
9c	2.86	54.0[a]	43.14

[a] Consists of a mixture of acetone and toluene (12.0% and 42.0%, respectively).



M306-4109

Figure 9-11. Tertiary graph illustrating the initial compositions of Tests T-5 and T-9.

T-5 and T-9 mixtures are slightly above the boundary curve; however, because toluene is more soluble than acetone in fuel oil, it was assumed that the solution would be a single-phase solution. This assumption was found to be wrong.

The 1% TNT solution created for Test T-5 was a single-phase solution. For Test T-9, a two-phase mixture was produced that comprised liquid and crystallized TNT.

9.3.2 Temperature effects. The solution temperature affects the phase boundaries of the multicomponent mixtures. Solubility data for TNT and toluene were collected from the Department of the Army, Technical Manual on Military Explosives (TM 9-1300-214, September 1984). A logarithmic relationship between the solubility and temperature was created from the data. The curve fitted to the solubility as defined by the following equation:

$$T = 44.41 \times \ln(S) - 112.28$$

Where:

T = Solution temperature (°F).

S = Solubility of TNT in toluene (g TNT/100 g solvent).

The solubility data and the equation were converted to a weight percentage and are shown in Figure 9-12.

The initial mixture of TNT and toluene for Test T-9 was heated to 100°F in accordance with the pre-established standard operating procedures. Mixing of the heated toluene/TNT solution with unheated fuel in the blending tank and the circulation of the solution in uninsulated piping exposed the solution to ambient temperatures. During Test T-9, which was conducted in late November and early December, the ambient conditions were below 32°F. The equation describing solubility of TNT in toluene predicts that TNT will precipitate or crystallize from the solution. Maintaining solution temperature during all phases of the test is an important consideration for future work.

9.3.3 Mixing. During preparation of the TNT and toluene solution for Test T-9, the TNT did not completely dissolve. After following the standard operating procedures, a large quantity of explosives was left undissolved on the bottom of Tank T-200. The explosives were later removed by the addition of more toluene. The temperature and solvent-to-TNT ratio was sufficient to dissolve all the TNT. The mixing action in the tank was insufficient to circulate fresh solvent to the mass of TNT, and the time allowed for complete dissolution was too short. This is a critical issue to be resolved in future test programs.

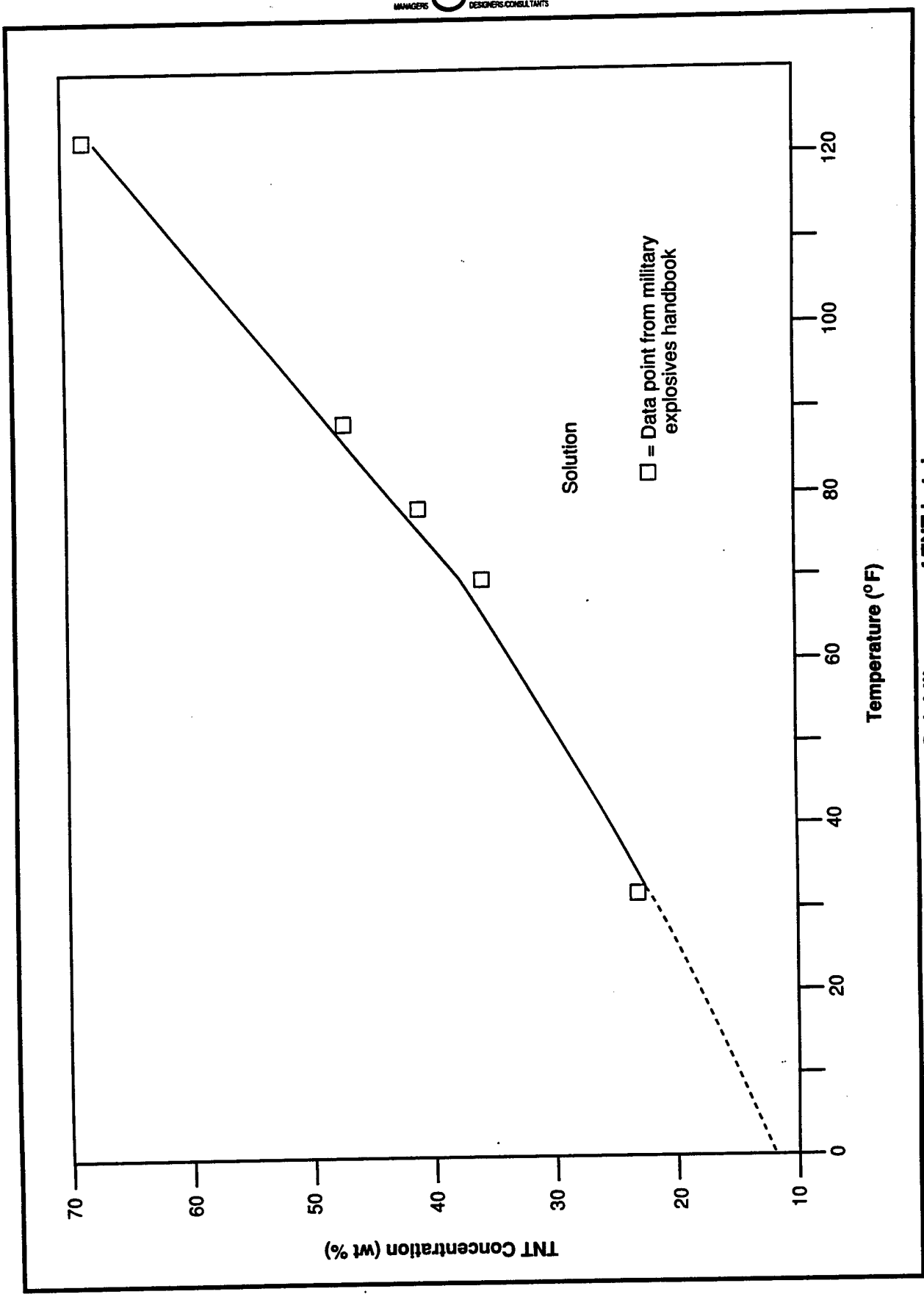


Figure 9-12. Solubility curve of TNT in toluene.

10. CONCLUSIONS AND RECOMMENDATIONS

10.1 Conclusions. Phase I of the supplemental fuels pilot-scale tests demonstrates that this technology has the potential to be an effective method to recover useable energy from waste explosives. From the five completed tests, a large amount of data was collected. Extensive experience was developed in operating the system. From the data and operational experience, the following conclusions are drawn:

- Dilute TNT solutions can be fired safely in a conventional boiler for the recovery of heat.
- Delivery of a stable and consistent explosives solution is necessary for proper operation of the boiler. High concentrations of TNT (i.e., >3%) caused problems with the current test equipment configuration, and modifications are necessary to the design if future development work is to be completed.
- Dilute TNT solutions can be processed while meeting the RCRA regulations concerning air emissions, i.e., >99.99% destruction and removal efficiency and particulate emissions of <0.08 gr/dscf.
- Emissions of NO_x were found to be elevated for processing the TNT solution. The levels of NO_x measured exceeded current air emissions regulations for standard boiler configurations.
- The recovery of heat as measured by boiler efficiency was not greatly affected when the boiler was fired with an explosives solution.

10.2 Recommendations. The development of supplemental fuel firing for full-scale applications will require further testing to demonstrate that the process is reliable and that high concentrations of explosives can be successfully fired. As a first step, laboratory-scale testing should be completed to resolve crystallization and solubility problems. The operation of the solution burners was troublesome when crystallized TNT was present in the solution. The temperature and phase diagrams for No. 2 fuel oil, TNT, and solvents (acetone and toluene) should be developed for the expected range of operating temperatures and concentrations.

Using the solution data developed on a bench-scale basis, further pilot-scale testing should be performed using TNT only. Before RDX studies, which are expected to involve two-phase solutions, are initiated, the boiler system should be fully demonstrated on single-phase TNT solutions. The TNT experiments should be designed to increase the operating concentrations of TNT. The pilot-scale system, as discussed in this subsection, must be modified to improve operability and maintainability. Following

successful completion of additional TNT tests, an evaluation and recommendation for RDX tests could then be made.

The recommendations provided as follows include specific changes to the pilot system located at the Hawthorne Army Ammunition Plant. These recommended changes will permit further pilot-scale demonstrations. The recommendations are as follows:

- The compressed air system should be improved to provide heated and dried air to the diaphragm pump and other air operated equipment on the feed system.

- The slurry handling piping and blending tank should be heated and insulated to maintain a constant temperature during all ambient conditions.

- The mixing equipment and operating procedures should be reviewed and modified to allow complete dissolution of the explosives in solvent prior to mixing with fuel oil.

- The instruments for measuring level, flow, and temperature of the feed blending system should be upgraded as discussed in Section 4.

- The burners for fuel oil and slurry should be modified to permit separate supply and control of compressed air to the burner nozzles. The supply of compressed air to the explosives solution burner should be remotely adjustable and equipped with instrumentation to monitor the flow and pressure of the compressed air.

- The control system for combustion air should be modified to respond to the stack gas oxygen concentration and avoid the use of fuel and explosives solution flow measurements (the flow monitors proved too unreliable for control purposes).

- The flame strength signal should be investigated to determine whether electrical signal interference is being caused by the wiring from the field to the control system. If the measured flame signal strength is found to be accurate, the propane pilot burner should be replaced with a pilot utilizing a compressed air and propane mixing system. A compressed air and propane mixing system can provide a consistent, high-strength flame for easy ignition.

- The data from the feed blending system controls should be collected on the boiler control system data logger. By recording these data on similar electronic media, analysis will be easier.

APPENDIX A

ASTM METHOD D-129

Designation: D 129 – 64 (Reapproved 1978)[ε1]

An American National Standard
British Standard 4454

Designation: 61/84

Standard Test Method for Sulfur in Petroleum Products (General Bomb Method)[1]

This standard is issued under the fixed designation D 129; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This method was adopted as a joint ASTM-IP standard in 1964.

This method has been adopted for use by government agencies to replace Method 5202 of Federal Test Method Standard No. 791b.

[ε1] NOTE—Editorial changes were made throughout in July 1981.

Attention is called to Section 2.2 on Safety and to the specific precautionary directions incorporated in the method.

1. Scope

1.1 This test method covers the determination of sulfur in petroleum products, including lubricating oils containing additives, additive concentrates, and lubricating greases, that cannot be burned completely in a wick lamp. The method is applicable to any petroleum product sufficiently low in volatility that it can be weighed accurately in an open sample boat and containing at least 0.1 % sulfur.

NOTE 1—This method is not applicable to samples containing elements that give residues, other than barium sulfate, which are insoluble in dilute hydrochloric acid and would interfere in the precipitation step. These interfering elements include iron, aluminum, calcium, silicon, and lead which are sometimes present in greases, lube oil additives, or additive oils. Other acid insoluble materials that interfere are silica, molybdenum disulfide, asbestos, mica, etc. The method is not applicable to used oils containing wear metals, and lead or silicates from contamination. Samples that are excluded can be analyzed by ASTM Test Method D 1552, Test for Sulfur in Petroleum Products (High-Temperature Method).[2]

2. Summary of Method

2.1 The sample is oxidized by combustion in a bomb containing oxygen under pressure. The sulfur, as sulfate in the bomb washings, is determined gravimetrically as barium sulfate.

2.2 **Safety**—*Strict adherence to all of the provisions prescribed hereafter ensures against explosive rupture of the bomb, or a blow-out, provided the bomb is of proper design and construction and in good mechanical condition. It is desirable, however, that the bomb be enclosed in a shield of steel plate at least 13 mm thick, or equivalent protection be provided against unforseeable contingencies.*

3. Apparatus and Materials

3.1 *Bomb*,[3,4] having a capacity of not less than 300 mL, so constructed that it will not leak during the test and that quantitative recovery of the liquids from the bomb may be achieved readily. The inner surface of the bomb may be made of stainless steel or any other material that will not be affected by the combustion process or products. Materials used in the bomb assembly, such as the head gasket and lead-wire insulation, shall be resistant to heat and chemical action, and shall not undergo any reaction that will affect the sulfur content of the liquid in the bomb.

3.2 *Sample Cup*, platinum, 24 mm in outside diameter at the bottom, 27 mm in outside diameter at the top, 12 mm in height outside, and weighing 10 to 11 g.

3.3 *Firing Wire*, platinum, approximately No. 26 B & S gage, 27 SWG, or equivalent.

Caution—*The switch in the ignition circuit shall be of a type which remains open, except when held in closed position by the operator.*

3.4 *Ignition Circuit*, capable of supplying sufficient current to ignite the cotton wicking or nylon thread without melting the wire. The current shall be drawn from a step-down transformer or from a suitable battery.

3.5 *Cotton Wicking or Nylon Sewing Thread*, white.

4. Reagents and Materials

4.1 *Purity of Reagents*—Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.[5] Other grades may be used, provided it is first ascertained that the

[1] This test method is under the jurisdiction of ASTM Committee D-2 on Petroleum Products and Lubricants.

Current edition effective Aug. 31, 1964. Originally issued 1922. In 1949, revised incorporating former D 894. Replaces D 129 – 62.

In the IP, this method is under the jurisdiction of the Standardization Committee.

[2] *Annual Book of ASTM Standards*, Vol 05.01.

[3] Criteria for judging the acceptability of new and used oxygen combustion bombs are described in ASTM Recommended Practice E 144, for Safe Use of Oxygen Combustion Bombs, *Annual Book of ASTM Standards*, Vol 14.02.

[4] A bomb conforming to the test specifications in IP Standard IP 12 is suitable.

[5] "Reagent Chemicals, American Chemical Society Specifications," Am. Chemical Soc., Washington, D.C. For suggestions on the testing of reagents not listed by the American Chemical Society, see "Reagent Chemicals and Standards," by Joseph Rosin, D. Van Nostrand Co., Inc., New York, N. Y., and the "United States Pharmacopeia."

reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

4.2 *Purity of Water*—Unless otherwise indicated, references to water shall be understood to mean distilled water or water of equal purity.

4.3 *Barium Chloride Solution* (85 g/litre)—Dissolve 100 g of barium chloride dihydrate ($BaCl_2 \cdot 2H_2O$) in distilled water and dilute to 1 liter.

4.4 *Bromine Water (saturated).*

4.5 *Hydrochloric Acid* (sp gr 1.19)—Concentrated hydrochloric acid (HCl).

4.6 *Oxygen*, free of combustible material and sulfur compounds, available at a pressure of 40 atm (41 kgf/cm^2).

4.7 *Sodium Carbonate Solution* (50 g/litre)—Dissolve 135 g of sodium carbonate decahydrate ($Na_2CO_3 \cdot 10H_2O$) or its equivalent weight in distilled water and dilute to 1 litre.

4.8 *White Oil, USP, or Liquid Paraffin, BP, or equivalent.*

5. Procedure

5.1 *Preparation of Bomb and Sample*—Cut a piece of firing wire 100 mm in length. Coil the middle section (about 20 mm) and attach the free ends to the terminals. Arrange the coil so that it will be above and to one side of the sample cup. Insert between two loops of the coil a wisp of cotton or nylon thread of such length that one end will extend into the sample cup. Place about 5 mL of Na_2CO_3 solution in the bomb (Note 2) and rotate the bomb in such a manner that the interior surface is moistened by the solution. Introduce into the sample cup the quantities of sample and white oil (Notes 3 and 4) specified in the following table, weighing the sample to the nearest 0.2 mg (when white oil is used, stir the mixture with a short length of quartz rod and allow the rod to remain in the sample cup during the combustion).

NOTE 2—After repeated use of the bomb for sulfur determinations, a film may be noticed on the inner surface. This dullness should be removed by periodic polishing of the bomb. A satisfactory method for doing this is to rotate the bomb in a lathe at about 300 rpm and polish the inside surface with emery polishing papers Grit No. 4/0, or equivalent paper,[6] coated with a light machine oil to prevent cutting, and then with a paste of grit-free chromic oxide[3] and water. This procedure will remove all but very deep pits and put a high polish on the surface. Before the bomb is used it should be washed with soap and water to remove oil or paste left from the polishing operation.

Caution—*Do not use more than 1.0 g total of sample and white oil or other low sulfur combustible material or more than 0.8 g if the IP 12 bomb is used.*

Sulfur Content percent	Weight of Sample, g	Weight of White Oil, g
5 or under	0.6 to 0.8	0.0
Over 5	0.3 to 0.4	0.3 to 0.4

NOTE 3—Use of sample weights containing over 20 mg of chlorine may cause corrosion of the bomb. To avoid this, it is recommended that for samples containing over 2 % chlorine, the sample weight be based on the chlorine content as given in the following table:

Chlorine Content percent	Weight of Sample, g	Weight of White Oil, g
2 to 5	0.4	0.4
Over 5 to 10	0.2	0.6
Over 10 to 20	0.1	0.7
Over 20 to 50	0.05	0.7

NOTE 4—If the sample is not readily miscible with white oil, other low sulfur combustible diluent may be substituted. However, combined weight of sample and nonvolatile diluent shall not exceed g or more than 0.8 g if the IP 12 bomb is used.

5.2 *Addition of Oxygen*—Place the sample cup in pos and arrange the cotton wisp or nylon thread so that the dips into the sample. Assemble the bomb and tighten cover securely. **Caution**—*Do not add oxygen or ignite sample if the bomb has been jarred, dropped, or tilted.* Ac oxygen slowly (to avoid blowing the oil from the cup) u pressure is reached as indicated in the following table:

Capacity of Bomb, ml	Minimum Gage Pressure,[4] atm kgf/cm^2	Maximum Ga Pressure,[4] atm kgf/cm^2
300 to 350	38 (39)	40 (41)
350 to 400	35 (36)	37 (38)
400 to 450	30 (31)	32 (33)
450 to 500	27 (28)	29 (30)

[4] The minimum pressures are specified to provide sufficient oxy complete combustion and the *maximum pressures represent a safety requ*

5.3 *Combustion*—Immerse the bomb in a cold dis water bath. Connect the terminals to the open elec circuit. Close the circuit to ignite the sample. Caution *not go near the bomb until at least 20 s after firing.* Re the bomb from the bath after immersion for at least 10 Release the pressure at a slow, uniform rate such tha operation requires not less than 1 min. Open the bom examine the contents. If traces of unburned oil or deposits are found, discard the determination and oughly clean the bomb before again putting it in use 2).

5.4 *Collection of Sulfur Solution*—Rinse the inter the bomb, the oil cup, and the inner surface of the b cover with a fine jet of distilled water, and colle washings in a 600-mL beaker having a mark to indic mL. Remove any precipitate in the bomb by means rubber policeman. Wash the base of the terminals unt washings are neutral to a suitable indicator. Add 10 saturated bromine water to the washings in the beake volume of the washings is normally in excess of 300 Place the sample cup in a 50-mL beaker. Add 5 m saturated bromine water, 2 mL of HCl, and enough d water just to cover the cup. Heat the contents of the to just below its boiling point for 3 or 4 min and add beaker containing the bomb washings. Wash the samp and the 50-mL beaker thoroughly with distilled Remove any precipitate in the cup by means of a policeman. Add the washings from the cup and the 5 beaker, and the precipitate, if any, to the bomb wash the 600-mL beaker. Do not filter any of the washing filtering would remove any sulfur present as ins material.

[6] Emery Polishing Paper Grit No. 4/0 may be purchased from the Behr-Manning Co., Troy, N. Y. Chromic oxide may be purchased from J. T. Baker & Co., Phillipsburg, N. J.

5.5 *Determination of Sulfur*—Evaporate the combined washings to 200 mL on a hot plate or other source of heat. Adjust the heat to maintain slow boiling of the solution and add 10 mL of a $BaCl_2$ solution, either in a fine stream or dropwise. Stir the solution during the addition and for 2 min thereafter. Cover the beaker with a fluted watch glass and continue boiling slowly until the solution has evaporated to a volume approximately 75 mL as indicated by a mark on the beaker. Remove the beaker from the hot plate (or other source of heat) and allow it to cool for 1 hr before filtering. Filter the supernatant liquid through an ashless, quantitative filter paper (Note 5). Wash the precipitate with water, first by decantation and then on the filter, until free from chloride. Transfer the paper and precipitate to a weighed crucible and dry (Note 6) at a low heat until the moisture has evaporated. Char the paper completely without igniting it, and finally ignite at a bright red heat until the residue is white in color. After ignition is complete, allow the crucible to cool at room temperature, and weigh.

NOTE 5—A weighed porcelain filter crucible (Selas type) of 5 to 9-μm porosity may be used in place of the filter paper. In this case the precipitate is washed free of chloride and then dried to constant weight at 500 ± 25°C.

NOTE 6—A satisfactory means of drying, charring, and igniting the paper and precipitate is to place the crucible containing the wet filter paper in a cold electric muffle furnace and to turn on the current. Drying, charring, and ignition usually will occur at the desired rate.

5.6 *Blank*—Make a blank determination whenever new reagents, white oil, or other low-sulfur combustible material are used. When running a blank on white oil, use 0.3 to 0.4 g and follow the normal procedure.

6. Calculation

6.1 Calculate the sulfur content of the sample as follows:

$$\text{Sulfur, weight percent} = (P - B)13.73/W$$

where:

P = grams of $BaSO_4$ obtained from sample,
B = grams of $BaSO_4$ obtained from blank, and
W = grams of sample used.

7. Report

7.1 Report the results of the test to the nearest 0.01 %.

8. Precision

8.1 The precision of this test is not known to have been obtained in accordance with currently accepted guidelines (for example in Committee D-2 Research Report RR: D02-1007, "Manual on Determining Precision Data for ASTM Methods on Petroleum Products and Lubricants").

8.1.1 *Repeatability*—The difference between two test results, obtained by the same operator with the same apparatus under constant operating conditions on identical test material, would in the long run, in the normal and correct operation of the test method, exceed the following values only in one case in twenty:

8.1.2 *Reproducibility*—The difference between two single and independent results obtained by different operators working in different laboratories on identical test material would, in the long run, in the normal and correct operation of the test method, exceed the following values only in one case in twenty:

Sulfur, weight percent	Repeatability	Reproducibility
0.1 to 0.5	0.04	0.05
0.5 to 1.0	0.06	0.09
1.0 to 1.5	0.08	0.15
1.5 to 2.0	0.12	0.25
2.0 to 5.0	0.18	0.27

NOTE 7—The precision shown in the above table does not apply to samples containing over 2 % chlorine because an added restriction on the amount of sample which can be ignited is imposed.

NOTE 8—This method has been cooperatively tested only in the range of 0.1 to 5.0 % sulfur.

NOTE 9—The following information on the precision of this method has been developed by the Institute of Petroleum (London):

(*a*) Results of duplicate tests should not differ by more than the following amounts:

Repeatability	Reproducibility
$0.016\,x + 0.06$	$0.037\,x + 0.13$

where x is the mean of duplicate test results.

(*b*) These precision values were obtained in 1960 by statistical examination of interlaboratory test results.[7] No limits have been established for additive concentrates.

[7] IP Standards for Petroleum and Its Products, Part I, Appendix E.

APPENDIX B

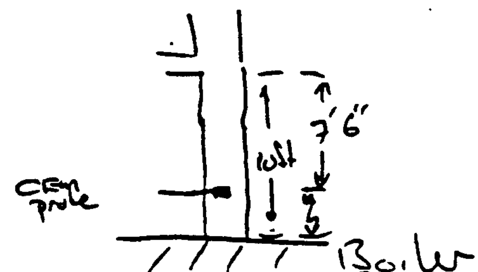
STACK SAMPLING DATA

- RAW TEST DATA
- LABORATORY REPORTS
- SAMPLE CALCULATIONS
- EQUIPMENT CALIBRATIONS

RAW TEST DATA

TRAVERSE POINT LOCATION FOR CIRCULAR DUCTS

PLANT USATHAMA
DATE 10/2/90
SAMPLING LOCATION mm5 Lower Port
INSIDE OF FAR WALL TO OUTSIDE OF PORT. (DISTANCE A) 18.75"
INSIDE OF NEAR WALL TO OUTSIDE OF PORT. (DISTANCE B) 6.75"
STACK I.D.. (DISTANCE A - DISTANCE B) 12.00"
NEAREST UPSTREAM DISTURBANCE 11'
NEAREST DOWNSTREAM DISTURBANCE 7.5'
CALCULATOR



SCHEMATIC OF SAMPLING LOCATION

TRAVERSE POINT NUMBER	FRACTION OF STACK I.D.	STACK I.D.	PRODUCT OF COLUMNS 2 AND 3 (TO NEAREST 1 8 INCH)	DISTANCE B	TRAVERSE POINT LOCATION FROM OUTSIDE OF PORT (SUM OF COLUMNS 4 & 5)
1	.067		.804		7.534 7 1/2
2	.250		3.0		9.75 9 3/4
3	.750		9.0		15.75 15 3/4
4	.933		11.196		17.946 18

GAS VELOCITY AND VOLUME DATA FORM

Plant USATHAMA / NWDAP Location M-5 PORT - STACK
Date 10-21-92 Run no. Prelim 24-hr. clock time
Operators MARZ / M.LK Stack diameter or dimensions, in. 2 12" Dia
Barometric pressure, in. Hg Cross sectional area, ft.²
Pitot tube identification no. P.2 Cp .84

Traverse Point Number	Velocity head (Δp), in. H_2O	Stack Temperature (T_s), ^oF.	Static pressure (P_{static}) in. H_2O	Cyclonic flow determination: Δp at 0° reference	Cyclonic flow determination: Angle (α) which yields a null Δp
1	.035	460			
2	.055	535			
3	.075	580			
4	.070	565			
1	.035	483			
2	.055	574	-.04	0.0	—
3	.075	581			
4	.07	582			
	Ave .058	545			
1	.035	557			
2	.050	569			
3	.075	594			
4	.07	528			
1	.035	470			
2	.055	580	-.05	0.0	—
3	.075	587			
4	.065	562			
	.0575	Ave 556			
	Avg. $\sqrt{\Delta p}$	Avg. Ts	Avg. P static		Avg. α [a]

[a] Must be <10 degrees to be acceptable.

GAS VELOCITY AND VOLUME DATA FORM

Plant Isabtaima Hawaii Location Stack
Date 1/13/80 Run no. ________ 24-hr. clock time ________
Operators ________ Stack diameter or dimensions, in. ________
Barometric pressure, in. Hg ________ Cross sectional area, ft^2 ________
Pitot tube identification no. ________ Cp .84

67°

	Traverse Point Number	Velocity head (Δp), in. H_2O	Stack Temperature (T_s), °F.	Static pressure (P static) in. H_2O	Cyclonic flow determination: Δp at 0° reference		Angle (α) which yields a null Δp	
0%	1	.005				1	.03	$\sqrt{\Delta p}$ = 0.2150
	2	.005	211		60%	2	.0375	
	3	.005				3	.045	
	4	.01				4	.055	
	5	.01	$\sqrt{\Delta p}$ = 0.08635			5	.055	532
	6	.01				6	.060	
	1	.005						
	2	.005			70%	1	.035	
	3	.0075	222			2	.04	
10%	4	.01				3	.0475	$\sqrt{\Delta p}$ 0.224
	5	.01	$\sqrt{\Delta p}$ 0.08997			4	.055	
	6	.0125				5	.0625	553
						6	.065	
	1	.01						
	2	.0125						
20%	3	.015	308					
	4	.0175			80%	1	.0425	
	5	.02	$\sqrt{\Delta p}$ = 0.12490			2	.045	
	6	.02				3	.0525	$\sqrt{\Delta p}$ = 0.232
						4	.06	
	1	.01				5	.0625	
30%	2	.015	354			6	.065	574
	3	.02						
	4	.025						
	5	.0275	$\sqrt{\Delta p}$ = 0.143508					
	6	.03				1	.045	
						2	.0475	
	1	.0225			90%	3	.055	$\sqrt{\Delta p}$ = 0.239
[illegible]%	2	.025	static -.01			4	.0625	
	3	.03				5	.0675	592
	4	.035	439			6	.07	
	5	.04	$\sqrt{\Delta p}$ = 0.18061					
	6	.04						
						1	.045	
						2	.05	
	1	.0225			100%	3	.055	
	2	.03	481			4	.0625	static
	3	.035				5	.065	-.0175
[illegible]%	4	.045				6	.0675	
	5	.05	$\sqrt{\Delta p}$ = 0.19493					
	6	.05						$\sqrt{\Delta p}$ = 0.2391
								590
		Avg. $\sqrt{\Delta p}$	Avg. Ts	Avg. P static			Avg. α [a]	

[a] Must be <10 degrees to be acceptable.

GAS VELOCITY AND VOLUME DATA FORM

Plant FWAAF Location Stack
Date 10/2/90 Run no. _____ 24-hr. clock time _____
Operators _____ Stack diameter or dimensions, in. _____
Barometric pressure, in. Hg _____ Cross sectional area, ft.^{2} _____
Pitot tube identification no. _____ Cp .84

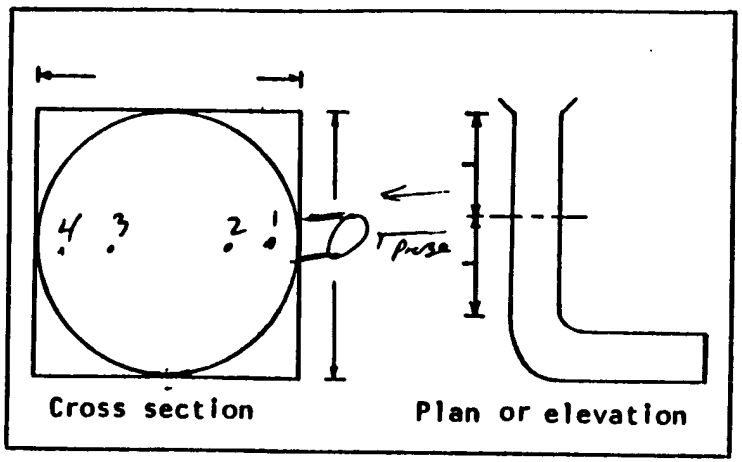
Traverse Point Number	Velocity head (Δp), in. H_2O	Stack Temperature (T_s),	Static pressure (P_{static}) in. H_2O	Cyclonic flow determination: Δp at 00 reference	Cyclonic flow determination: Angle (α) which yields a null Δp
0%		73°F 23°F Moisture			
1	0				
2	.005			1 .04	
-7	.005	4.53 FT/sec	60%	2 .045	537 dscf/m
4	.01	1830 dscf/m		3 .045	
5	.01		385	4 .0525	
6	.0125	$\sqrt{\Delta p}$ = .075537		5 .055	
				6 .0575	$\sqrt{\Delta p}$ = .222584
1	.005				
2	.005				
10%	.0075				
4	.01	218 dscf/m	70%	1 .045	
5	.01			2 .05	
-6	.0125	$\sqrt{\Delta p}$ = .089971	407	3 .05	572 dscf/m
				4 .06	
1	.01			5 .065	
2	.015			6 .065	$\sqrt{\Delta p}$ = .235699
3	.015				
4	.0175	358 dscf/m			
5	.02		80%	1 .045	
6	.02	$\sqrt{\Delta p}$ = .126680		2 .05	
				3 .055	
22-125	.0175		420	4 .065	$\sqrt{\Delta p}$ = .239185
2	.02			5 .065	
30%	.02	360 dscf/m		6 .065	581 dscf/m
4	.0225				
245	.025		90%	1 .045	
6	.025	$\sqrt{\Delta p}$ = .148245		2 .05	
				3 .055	
406	.0225		426	4 .065	$\sqrt{\Delta p}$ = .239185
2	.025			5 .065	
319	.03	427 dscf/m		6 .065	581 dscf/m
4	.035				
5	.035				
6	.04	$\sqrt{\Delta p}$ = .175914	100	1 .045	
				2 .05	
50%	.03			3 .055	
2	.0375		428	4 .065	
3	.04	489 dscf/m		4 .0675	
253	.0475			6 .0675	$\sqrt{\Delta p}$ = .240804
5	.0475				
6	.05	$\sqrt{\Delta p}$ = .20Hz!			783 dscf/m
	Avg. $\sqrt{\Delta p}$	Avg. T_s	Avg. P_{static}		Avg. α [a]

[a] Must be <10 degrees to be acceptable.

PARTICULATE FIELD DATA FORM

Sheet ___ of ___

Plant USAF/ANG HWAAP
City HAWTHORNE NEVADA
Location STACK
Operator MILLS/MARZ
Run No. ONE A Date 10/22/80
Ambient temp., °F 75
Baro. press. (P_b), in. Hg. 26.0
Sample box no. ___
Meter box no. NUTECH 12
Meter box ΔH@ 1.905
Meter box cal. (Y) 1.008
Probe length, ft. 3 FT
Probe liner material PYREX
Probe heater setting 20



Pitot tube identification no. P2
Pitot tube cal. factor (C_p) 0.84
Nozzle identification no. S11
Avg. nozzle diameter (D_n), in. .500
Pyrometer identification no. NUTECH 12
Thermocouple identification no. ___
Assumed moisture, % 10
Assumed temperature, °F. 600
Static pressure (P_{static}), in. H_2O -.05
C factor ___ Reference Δp ___
Initial leak rate .010 cfm @ 15 in. Hg
Final leak rate .014 cfm @ 7 in. Hg
Filter no. 20055

M3-316 LINE — INITIAL GOOD — FINAL GOOD
PITOT — GOOD — GOOD

Test point schematic

Traverse point number	Sampling time, min.	24-hr. clock time	Velocity head (ΔP), in. H_2O	Orifice meter pressure differential (ΔH), in. H_2O	Gas meter reading, $ft.^3$	Dry gas meter temperature (T_m) Inlet °F.	Dry gas meter temperature (T_m) Outlet °F.	Source temperature (T_s), °F	Pump vacuum, in.Hg. gauge	Impinger exit gas temp., °F.	Filter box temp., °F.	I M
	0	1601			168,115							
1	5		.075	2,29	172.4	78	77	613	7.0	68	243	27
1	10		.07	2,14	176.6	81	77	616	7.0	67	239	27
1	15	1616-1618	.0675	2.06	180,7	84	78	614	7.0	66	237	27
2	20		.06	1.84	184,7	85	80	588	6.0	66	242	28
2	25		.06	1.84	188,9	87	80	590	6.0	66	236	3x
2	30	1631-1650	.06	1.84	192,278	87	83	593	6.0	65	240	2x
3	35		.045	1.38	195,7	88	83	523	4.5	65	234	3x
3	40		.045	1.38	199,1	89	83	527	4.5	66	233	29
3	45		.05	1,53	202,6	90	84	525	4.5	65	245	24
4	50		.06	1.84	206,7	92	85	600	5.0	65	235	25
4	55		.06	1.88	210,3	93	85	603	6.0	46	234	25
4	60	1720	.066	2,04	214,252	94	85	601	6.0	67	230	26
			0.243817									
	Total θ		Avg. ~~Σ~~ΔP	Avg. ΔH	Total V_m	Avg. T_m		Avg. T_s	Max. vac.	Max. temp.	Min. Max.	
	60		0.243817	1.84667	46,137	84.375		582,75				

Comments: 1616-1618 } GIVE Test - AUTOMATIC Probe Having Problems 1631-1650 } NOTE SAMPLE WAS COLLECTED AT TRAVERSE PT 3,4 — 1 + 2.

SAMPLE RECOVERY AND INTEGRITY DATA FORM

Plant USAZIANA Sample date 10/22/90

Sample location STACK Run number ONE A

Sample recovery person Mills/MAHZ Recovery date 10/22/90

Filter(s) number 20055

MOISTURE

Impingers			Silica gel		
Final volume (wt)	271 ml (g)		Final wt	317 g	g
Initial volume (wt)	200 ml (g)		Initial wt	300 g	g
Net volume (wt)	71 ml (g)		Net wt	17 g	g
Total moisture	88 g				

Color of silica gel 1/4 Pink 3/4 Blue

Description of impinger water Clear Colorless

RECOVERED SAMPLE

Blank filter container number BLANK-FILT-19954 Sealed

Filter container number T1A-PART-FILT (20055) Sealed ✓

Description of particulate on filter

Acetone rinse container number T1A PART-FH1A Liquid level marked? ✓

Acetone blank container number BLANK-ACETONE-01 Liquid level marked?

Samples stored and locked ✓

Remarks

Date of laboratory custody

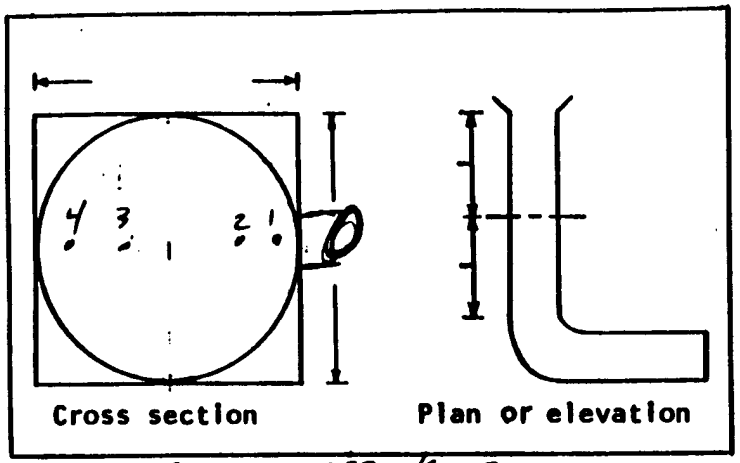
Laboratory personnel taking custody

Remarks

...TICULATE F ... D..... FOR..

S: _ _

Plant USATHAMA HWAAP
City NAUTHORN, NV
Location STACK
Operator MILLS
Run No. ~~ONE~~ TWO Date 10-25-90
Ambient temp., °F ~~X~~ 75
Baro. press. (P_b), in. Hg. 25.77
Sample box no.
Meter box no. Wintech 12
Meter box ΔH@ 1.905
Meter box cal. (Y) 1.008
Probe length, ft. 3'
Probe liner material BORO
Probe heater setting 20



Pitot tube identification no. P2
Pitot tube cal. factor (C_p) .84
Nozzle identification no. 416
Avg. nozzle diameter (D_n), in. .430
Pyrometer identification no. Wintech 12
Thermocouple identification no.
Assumed moisture, % 10
Assumed temperature, °F. 570
Static pressure (Pstatic), in. H_2O -.05
C factor ___ Reference Δp ___
Initial leak rate .006 cfm @ 15 in. Hg
Final leak rate .004 cfm @ 6 in. Hg
Filter no. 19947

Comments:	recvd.	Final
M-3 Bag	ok	ok
Line	ok	ok
Pitot	ok	

K = MT83: F8.6 / ST500 K = 17.3 {ST 575 / MT 85 K = 17.7 MT 85 / ST 550 MT 775 K = 17.91 Test point schematic MT 80 / ST 475 K = 18.9

Traverse point number	Sampling time, min.	24-hr. clock time	Velocity head (ΔP), in. H_2O	Orifice meter pressure differential (ΔH), in. H_2O	Gas meter reading, $ft.^3$	Dry gas meter temperature (T_m) Inlet °F.	Dry gas meter temperature (T_m) Outlet °F.	Source temperature (T_s), °F	Pump vacuum, in.Hg. gauge	Impinger exit gas temp., °F.	Filter box temp., °F.	Ice Bath
0		2218			319.228 ~~317.504~~							
1	5		.03	0.52	321.2	76	76	460	2.0	62	235	34
1	10	2222-2250	.03	0.52	323.4	78	77	433	2.0	61	235	36
1	15		.03	0.54	325.5	78	78	432	2.0	57	235	37
1	20		.03	0.54	327.7	80	78	437	2.0	56	234	37
2	25		.045	0.85	330.3	81	78	484	3.0	56	236	38
2	30		.045	0.85	333.0	83	78	493	3.0	56	237	40
2	35		.045	0.85	335.6	84	79	488	3.0	56	235	40
2	40		.045	0.85	338.4	84	79	486	3.0	56	236	40
3	45		.06	1.11	341.2	85	80	497	4.0	55	237	42
3	50		.06	1.12	344.2	85	79	509	4.0	55	237	42
3	55		.06	1.12	347.0	85	79	508	4.0	55	236	42
3	60	2323-0110	.06	1.12	349.9	85	80	502	4.0	55	237	43
4	65		.045	0.85	352.6	79	79	489	3.0	51	234	47
4	70		.05	0.93	355.4	82	79	479	3.5	51	234	48
4	75		.05	0.93	358.3	84	80	482	4.0	51	234	48
4	80	0134	.05	0.93	360.888	85	80	478	4.0	52	233	49
	Total θ		Avg. $\sqrt{\Delta P}$ 0.212756	Avg. ΔH .85187	Total V_m 41.660	Avg. T_m 80.41		Avg. T_s 478.56	Max. vac.	Max. temp.	Min. Max.	

Comments: 2222 - Flame at stop Test
2323 - Flame at stop Test

SAMPLE RECOVERY AND INTEGRITY DATA FORM

Plant USATNAMA HUBAP Sample date 10-26-90

Sample location STACK Run number ~~FOUR~~ ONE B

Sample recovery person MARK/MIKE Recovery date 10-26-90

Filter(s) number

MOISTURE

Impingers			Silica gel		
Final volume (wt)	262 ml (g)		Final wt	314 g	g
Initial volume (wt)	200 ml (g)		Initial wt	300 g	g
Net volume (wt)	62 ml (g)		Net wt	14 g	g
Total moisture	76 g				

Color of silica gel 1/2 BLUE 1/2 PINK

Description of impinger water MILKY WHITE

RECOVERED SAMPLE

Blank filter container number BLANK-FILT-19954 Sealed ✓

Filter container number TIB PART-FILT 19947 Sealed

Description of particulate on filter BLACK VERY FINE PARTICULATE

Acetone rinse container number TIB-PART-FH1A Liquid level marked?

Acetone blank container number BLANK-ACETONE-01 Liquid level marked? ✓

Samples stored and locked

Remarks

Date of laboratory custody

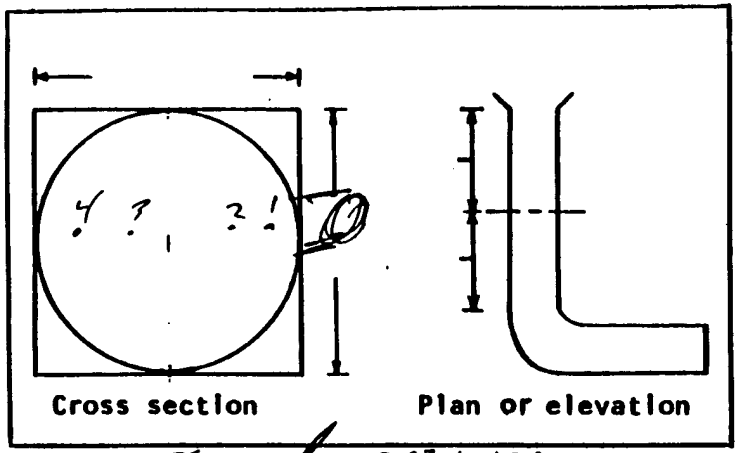
Laboratory personnel taking custody

Remarks

PARTICULATE FIELD DATA FORM

Sheet 1

Plant USAMMA HWAAP
City FLANTSVILLE NEVADA
Location STACK
Operator MILLS
Run No. PC Date 10/30/90
Ambient temp., °F 78
Baro. press. (P_b), in. Hg. 28.50
Sample box no.
Meter box no. NUTECH 12
Meter box ΔH@ 1.905
Meter box cal. (Y) 1.008
Probe length, ft. 3FT
Probe liner material BOROSILICATE
Probe heater setting 30



Test point schematic

Pitot tube identification no. P2
Pitot tube cal. factor (C_p) 0.84
Nozzle identification no. ~~#5~~ 41K
Avg. nozzle diameter (D_n), in. ~~.430~~ .484
Pyrometer identification no. NUTECH 12
Thermocouple identification no.
Assumed moisture, % ~~16~~ 9.5
Assumed temperature, °F. ~~600~~ 550
Static pressure (Pstatic), in. H_2O -.07
C factor ____ Reference Δp ____
Initial leak rate .008 cfm @ 15 in. Hg
Final leak rate .004 cfm @ 7 in. Hg
Filter no. 19955

Comments:
M3 BAG Link Leak Check OK
M3 Link Leak Check OK
PITOT Line Leak Check OK

Traverse point number	Sampling time, min.	24-hr. clock time	Velocity head (ΔP), in. H_2O	Orifice meter pressure differential (ΔH), in. H_2O	Gas meter reading, $ft.^3$	Dry gas meter temperature (T_m) Inlet °F.	Dry gas meter temperature (T_m) Outlet °F.	Source temperature (T_s), °F	Pump vacuum, in.Hg. gauge	Impinger exit gas temp., °F.	Filter box temp., °F.	
	0	~~1302~~ 1310			361.632							
1	5		.035	0.96	364.5	82	81	~~780~~ 502	2.5	70	227	22
1	10		.035	0.96	367.8	84	82	507	2.5	68	232	22
1	15		.04	1.09	370.4	87	83	515	3.0	67	233	21
1	20		.04	1.15	373.5	88	83	521	3.0	67	235	19
2	25		.05	1.44	376.8	89	84	545	3.5	67	235	20
2	30		.05	1.44	380.3	91	84	541	4.0	67	235	20
2	35		.05	1.44	383.8	92	85	548	4.0	66	238	21
2	40		.05	1.44	387.2	93	85	549	4.0	66	230	22
3	45		.065	1.86	391.0	94	86	553	5.0	66	230	24
3	50		.06	1.74	394.9	95	87	551	5.0	67	231	22
3	55		.06	1.74	398.6	95	87	551	5.0	67	230	23
3	60		.06	1.74	402.2	96	88	547	5.0	66	225	22
4	65		.055	1.59	406.0	97	88	522	4.0	65	230	21
4	70		.055	1.59	409.6	97	89	523	4.0	65	231	22
4	75		.055	1.59	413.2	97	89	518	4.0	65	232	22
4	80	1430	.055	1.59	416.825	97	89	512	4.0	66	23	23
	Total θ 80		Avg. $\sqrt{\Delta P}$ 0.22480	Avg. ΔH 1.46000	Total V_m 55.193	Avg. T_m 88.845		Avg. $\sqrt{T_s}$ 531.56	Max. vac.	Max. temp.	Min. Max.	

Comments:

SAMPLE RECOVERY AND INTEGRITY DATA FORM

Plant USAHAMA HWAAP Sample date 10/30/90

Sample location STACK Run number ONE -C

Sample recovery person MILLS Recovery date 10/30/90

Filter(s) number 19955

165
126

MOISTURE

Impingers			Silica gel		
Final volume (wt)	291 ml (g)		Final wt	316 g	g
Initial volume (wt)	200 ml (g)		Initial wt	300 g	g
Net volume (wt)	91 V ml (g)		Net wt	16 V g	g
Total moisture	107 g				

Color of silica gel 1/2 Blue 1/2 Pink

Description of impinger water Clear colorless

RECOVERED SAMPLE

Blank filter container number BLANK - FILT - 19954 Sealed ✓

Filter container number TIC - PART - FILT - 19955 Sealed ✓

Description of particulate on filter Very Fine Black Soot

Acetone rinse container number TIC - PART - FHA Liquid level marked? ✓

Acetone blank container number Blank Acetone -01 Liquid level marked? ✓

Samples stored and locked

Remarks

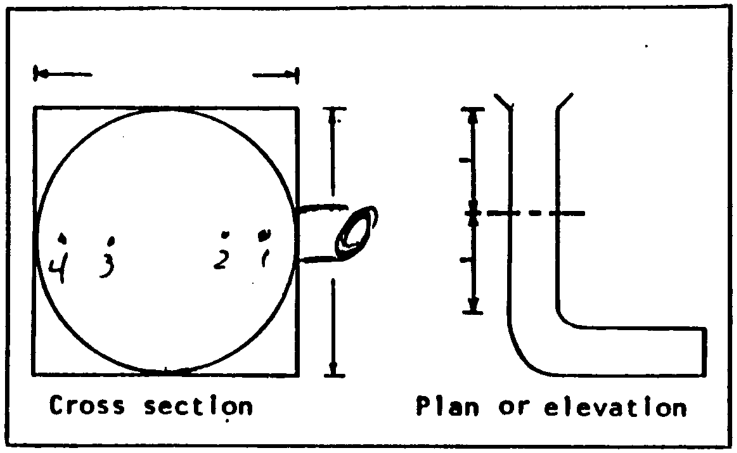
Date of laboratory custody

Laboratory personnel taking custody

Remarks

PARTICULATE FIELD DATA FORM

Plant USATHAMA – HWAAP
City Hawthorne, NV
Location STACK
Operator MILLS / MAZE
Run No. TWO Date 10-23-90
Ambient temp., °F 70
Baro. press. (P_b), in. Hg. 25.90
Sample box no.
Meter box no. Nutech 12
Meter box ΔH@ 1.905
Meter box cal. (Y) 1.008
Probe length, ft. 3
Probe liner material Boro
Probe heater setting 20



Test point schematic

Pitot tube identification no. P2
Pitot tube cal. factor (C_p) .84
Nozzle identification no. .51D
Avg. nozzle diameter (D_n), in. .500
Pyrometer identification no. Nutech 12
Thermocouple identification no.
Assumed moisture, % 10
Assumed temperature, °F. [illegible]
Static pressure (P_{static}), in. H_2O -.07
C factor ____ Reference Δp
Initial leak rate .012 cfm @ 15 in. Hg
Final leak rate .008 cfm @ 10 in. Hg
Filter no. 19948

Pitot Good / Good
M-3-Line Good / Good
Bag Good

① K = 33.06 MT 85 [illegible] ② K = 31.4 MT 90 57600

Traverse point number	Sampling time, min.	24-hr. clock time	Velocity head (ΔP), in. H_2O	Orifice meter pressure differential (ΔH), in. H_2O	Gas meter reading, ft.³	Dry gas meter temperature (T_m) Inlet °F.	Outlet °F.	Source temperature (T_s), °F	Pump vacuum, in.Hg. gauge	Impinger exit gas temp., °F.	Filter box temp., °F.	Fn Bo
0	0	1726			215.365							
1	5	①	.05	1.65	218.9	84	83	465	5.0	68	234	27
1	10	↓	.05	1.65	222.5	87	83	469	5.0	67	232	26
1	15		.05	1.65	226.1	89	84	469	5.0	65	233	25
2	20		.065	2.15	230.2	90	84	550	6.0	65	234	25
2	25		.065	2.15	234.3	93	85	561	6.0	65	235	25
2	30		.065	2.15	238.4	93	86	562	6.0	66	235	25
3	35		.09	2.97	243.3	95	86	626	9.0	68	237	26
3	40	②	.095	~~3.44~~ 2.98	248.2	96	87	630	9.0	67	238	25
3	45		.095	2.98	253.3	96	87	628	9.0	66	258	25
4	50		.095	2.98	258.3	96	88	610	9.0	66	241	28
4	55		.095	2.98	263.1	97	88	606	9.0	67	238	30
4	60	1826	.09	2.83	~~269.5~~ 267.958	97	88	605	8.5	68	239	31
	Total θ		Avg. √ΔP 0.272380	Avg. ΔH 2.42667	Total V_m 52.593	Avg. T_m 89.25		Avg. T_s 565.08	Max. vac.	Max. temp.	Min. Max.	

Comments:

SAMPLE RECOVERY AND INTEGRITY DATA FORM

Plant USATHAMA Sample date 10-23-90

Sample location STACK Run number TWO

Sample recovery person MAZ/MILLS Recovery date 10-23-90

Filter(s) number 19948

164
130
MOISTURE

Impingers		Silica gel	
Final volume (wt)	294 ml (g)	Final wt	317 g ____ g
Initial volume (wt)	200 ml (g)	Initial wt	300 g ____ g
Net volume (wt)	94 ml (g)	Net wt	17 g ____ g

Total moisture ____ g

Color of silica gel 1/2 Blue 1/2 Pink

Description of impinger water Clear Colorless

RECOVERED SAMPLE

Blank filter container number Blank-FILT-19954 Sealed ✓

Filter container number T2-PART-FILT (19948) Sealed ✓

Description of particulate on filter ____

Acetone rinse container number T2-PART-FHA Liquid level marked? ✓

Acetone blank container number BLANK-ACETONE-01 Liquid level marked? ✓

Samples stored and locked ____

Remarks ____

Date of laboratory custody ____

Laboratory personnel taking custody ____

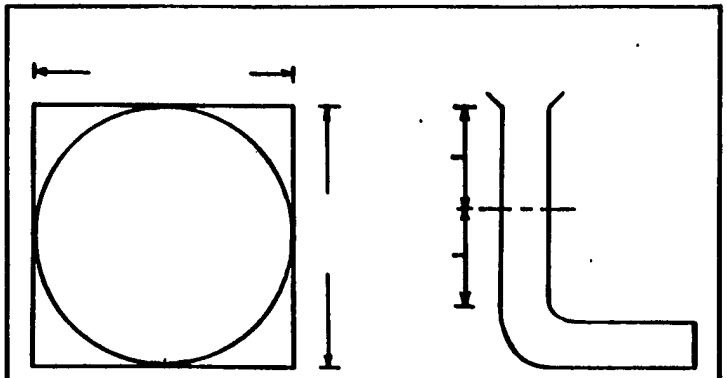
Remarks ____

PARTICULATE FIELD DATA FORM

Sheet ___ of ___

Plant USATHAMA
City FALLON NEVADA
Location STACK
Operator MILLS
Run No. 3 Date 10/25/90
Ambient temp., °F ~~75~~ 78
Baro. press. (P_b), in. Hg. 25.80
Sample box no. ___
Meter box no. NUTECH 12
Meter box ΔH@ 1.905
Meter box cal. (Y) 1.008
Probe length, ft. 3FT
Probe liner material BOROSILICATE
Probe heater setting 20

STGO MT80 K=16.9



Test point schematic

Pitot tube identification no. P2
Pitot tube cal. factor (C_p) 0.84
Nozzle identification no. 4/6
Avg. nozzle diameter (D_n), in. ~~.484~~ .430
Pyrometer identification no. NUTECH 12
Thermocouple identification no. ___
Assumed moisture, % 10
Assumed temperature, °F. 60
Static pressure (P_{static}), in. H_2O -.06
C factor ___ Reference Δp ___
Initial leak rate .01 cfm @ 15 in. Hg
Final leak rate ___ cfm @ ___ in. Hg
Filter no. 19964

	Init	Final
Pitot leak check	OK	OK
M3 Line leak check	OK	OK
M3 13" Hg leak check	02	OK

Traverse point number	Sampling time, min.	24-hr. clock time	Velocity head (ΔP), in. H_2O	Orifice meter pressure differential (ΔH), in. H_2O	Gas meter reading, ft.³	Dry gas meter temperature (T_m) Inlet °F.	Dry gas meter temperature (T_m) Outlet °F.	Source temperature (T_s), °F	Pump vacuum, in.Hg. gauge	Impinger exit gas temp., °F.	Filter box temp., °F.	IC / BAT
	0	1607			269,847							
1	5		.04	.68	272.3	80	80	484	2.0	68	233	25
1	10		.04	.68	274.6	81	80	490	2.0	66	234	24
1	15		.04	.68	277.0	82	80	489	2.0	66	236	25
1	20		.045	.76	279.6	84	81	500	2.0	66	236	25
2	25		.055	.93	282.3	85	82	564	3.0	65	236	25
2	30		.065	.93	285.1	87	82	570	3.0	65	237	25
2	35		.06	1.01	287.9	89	82	568	3.0	65	236	25
2	40		.06	1.01	290.9	90	83	566	3.0	66	238	25
3	45		.075	1.27	294.1	90	84	602	4.0	66	239	26
3	50		.08	1.35	297.3	91	84	617	4.0	66	239	26
3	55		.085	1.44	300.6	92	84	618	4.0	65	240	26
3	60		.085	1.44	303.9	93	85	612	4.0	65	240	26
4	~~60~~ 70		.085	1.44	307.3	94	86	590	4.5	65	239	27
4	75		.08	1.35	310.5	94	86	580	4.5	65	237	27
4	80	1737	.085	1.44	313.9	94	87	598	4.5	66	240	27
	Total θ		Avg. $\sqrt{\Delta P}$ 0.254272	Avg. ΔH 1.115625	Total V_m 47.396	Avg. T_m 86.06		Avg. T_s 565.38	5.0 Max. vac.	67 Max. temp.	232 Min. Max.	28

Comments:

SAMPLE RECOVERY AND INTEGRITY DATA FORM

Plant ALSATAMA Sample date 10/25/90

Sample location Stack Run number 3

Sample recovery person Mills/Mantz Recovery date 10/26/90

Filter(s) number

MOISTURE

Impingers			Silica gel		
Final volume (wt)	276 ml (g)		Final wt	318 g	g
Initial volume (wt)	200 ml (g)		Initial wt	300 g	g
Net volume (wt)	76 ml (g)		Net wt	18 g	g
Total moisture	94 g				

Color of silica gel 1/2 Blue 1/2 Pink

Description of impinger water Clear colorless

RECOVERED SAMPLE

Blank filter container number Blank-Filt-19954 Sealed ✓

Filter container number T3-Part-Filt (19964) Sealed ✓

Description of particulate on filter

Acetone rinse container number T3-Part-FHA Liquid level marked? ✓

Acetone blank container number Blank-Acetone-01 Liquid level marked? ✓

Samples stored and locked

Remarks

Date of laboratory custody

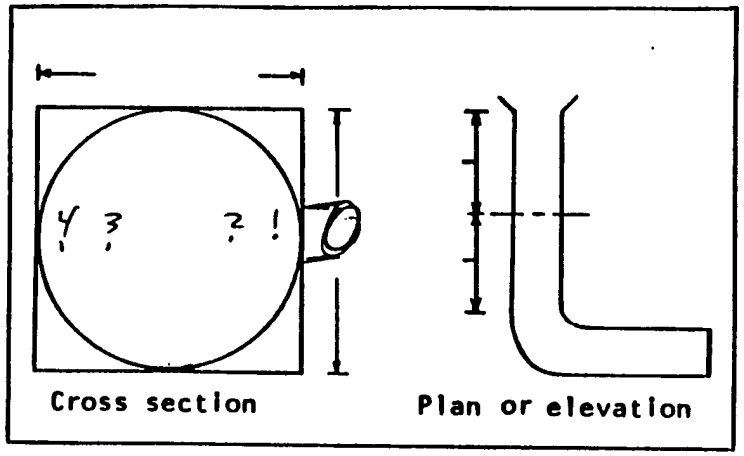
Laboratory personnel taking custody

Remarks

PARTICULATE FIELD DATA FORM

Sheet ___ of ___

Plant USATHAMA HWAAP
City HAWTHORNE NEVADA
Location STACK
Operator Mills/Mohr
Run No. 5 Date 10/31/90
Ambient temp., °F ~~60~~ 47 25.54
Baro. press. (P_b), in. Hg. [redacted]
Sample box no. ___
Meter box no. NUTECH 12
Meter box ΔH@ 1.905
Meter box cal. (Y) 1.008
Probe length, ft. 3FT
Probe liner material BOROSILICATE
Probe heater setting 20



Test point schematic

Pitot tube identification no. P-2
Pitot tube cal. factor (C_p) 0.84
Nozzle identification no. 416
Avg. nozzle diameter (D_n), in. .430
Pyrometer identification no. NUTECH 12
Thermocouple identification no. ___
Assumed moisture, % 10
Assumed temperature, °F 575 - (OK)
Static pressure (Pstatic), in. H_2O -.06
C factor ___ Reference Δp ___
Initial leak rate .012 cfm @ 15 in. Hg
Final leak rate .008 cfm @ 8 in. Hg
Filter no. ___

	Pitot	Pump
Pitot leak check	OK	OK
M3 line leak check	OK	OK
M3 filter leak check	OK	

Traverse point number	Sampling time, min.	24-hr. clock time	Velocity head (ΔP), in. H_2O	Orifice meter pressure differential (ΔH), in. H_2O	Gas meter reading, $ft.^3$	Dry gas meter temperature (Tm) Inlet °F.	Dry gas meter temperature (Tm) Outlet °F.	Source temperature (T_s), °F	Pump vacuum, in.Hg. gauge	Impinger exit gas temp., °F.	Filter box temp., °F.	
	0	2335			417.790							
1	5		.055	0.95	420.6	78	78	535	3.5	53	223	38
1	10		.055	0.95	423.5	80	79	566	3.5	51	241	39
1	15		.05	0.86	426.0	83	79	551	3.0	51	245	40
1	20		.05	0.86	428.7	84	79	559	3.0	51	244	41
2	25	2359-0005	.07	1.21	431.7	85	80	595	4.0	51	243	42
2	30		.075	1.29	434.7	83	81	586	4.0	53	242	43
2	35		.085	1.47	437.9	87	81	604	5.0	53	245	44
2	40		.085	1.47	441.5	89	82	604	5.0	54	245	44
3	45		.105	1.82	445.3	90	82	589	6.0	55	246	44
3	50	0027-0037	.105	1.82	448.9	92	83	582	6.0	56	246	45
3	55		.115	1.99	452.9	88	84	616	6.5	56	244	46
3	60		.11	1.90	456.9	92	84	612	7.0	56	246	47
4	65		.085	1.47	460.5	93	85	540	5.5	58	248	47
4	70		.085	1.47	463.9	94	85	523	5.5	60	245	48
4	75	0111	.095	1.64	467.4	94	86	534	6.0	61	246	48
4	80	~~0311~~	.08	1.38	470.894	94	86	518	5.0	61	246	48
	Total θ 80		Avg. $\sqrt{\Delta P}$ 0.7831749	Avg. ΔH 1.40938	Total Vm 53.104	Avg. Tm 85.00		Avg. T_s 569.62	Max. vac	Max. temp.	Min. Max.	

Comments: k=16.89 ST600 MT85 ST575 MT ~~xx~~ 173 / 2359-0005 / 0027-0037

SAMPLE RECOVERY AND INTEGRITY DATA FORM

Plant USATHAMA HWAAP — Sample date 10-31-90

Sample location STACK — Run number 5

Sample recovery person MARZ — Recovery date 11-1-90

Filter(s) number 19945

MOISTURE

Impingers			Silica gel		
Final volume (wt)	114 162 ml (g)		Final wt	316 g	g
Initial volume (wt)	100 100 ml (g)		Initial wt	300 g	g
Net volume (wt)	14 62 ml (g) 76		Net wt	16 g	g
Total moisture	92 g				

Color of silica gel 1/2 pink 1/2 blue

Description of impinger water slightly cloudy

RECOVERED SAMPLE

Blank filter container number Blank FILT - 19954 — Sealed

Filter container number 19945 TS-PART — Sealed ✓

Description of particulate on filter black

Acetone rinse container number TS-PART-FNL — Liquid level marked? Yes

Acetone blank container number Blank Acetone -01 — Liquid level marked? Yes

Samples stored and locked ✓

Remarks

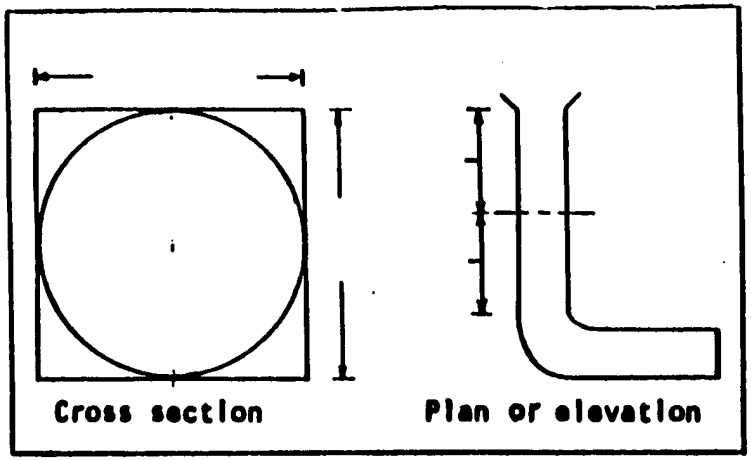
Date of laboratory custody

Laboratory personnel taking custody

Remarks

MODIFIED METHOD 5 FIELD DATA FORM

Plant USATHAMA NAAP
City Hawthorne NV
Location
Operator MOE2
Run No. FIVE Date 10-31-90
Ambient temp., °F 48
Baro. press. (P_b), in. Hg. 25.54
Sample box no.
Meter box no. Nutech 14
Meter box ΔH@ 1.93
Meter box cal. (Y) 1.000
Probe length, ft. 3'
Probe liner material Boro
Probe heater setting 20



Pitot tube identification no. P21
Pitot tube cal. factor (C_p) .84
Nozzle identification no. 41A
Avg. nozzle diameter (D_n), in. .402
Pyrometer identification no. Nutech 14
Thermocouple identification no.
Assumed moisture, % 10
Assumed temperature, °F. 60
Static pressure (Pstatic), in. H_2O -.07
C factor ___ Reference Δp
Initial leak rate .01 cfm @ 15 in. Hg
Final leak rate .015 cfm @ 9 in. Hg
Filter no.
Comments: 3.716s explosives

Test point schematic

Traverse point number	Sampling time, min.	24-hr. clock time	Velocity head (ΔP), in. H_2O	Orifice meter pressure differential (ΔH), in. H_2O	Gas meter reading, $ft.^3$	Dry gas meter temperature (T_m) Inlet °F.	Dry gas meter temperature (T_m) Outlet °F.	Source temperature (T_s), °F	Pump vacuum, in.Hg. gauge	Probe/Filter Exit Gas Temp. ③ °F	XAD 1	Filter Box/ XAD Exit temp., °F 2	ICE	Impinger Exit Gas Temp. °F
	0	1335			730.526									
1	5		.05	.68	732.9	77	78	525	3.0	245	50	51	38	52
1	10		.055	.75	735.3	77	77	542	3.5	245	46	51		52
1	15		.055	.75	737.8	79	77	544	4.0	248	47	51		51
1	20		.055	.75	740.3	80	78	554	4.0	247	47	51		51
2	25	1134/0005	.08	1.09	743.4	82	78	618	5.0	249	48	51		51
2	30		.08	1.09	746.2	82	80	618	5.0	249	50	52	42	52
2	35		.085	1.16	749.3	84	80	637	5.5	248	51	52		53
2	40		.085	1.14	752.4	85	83	635	5.5	249	52	52		53
3	45		1.0	1.3	755.5	87	81	654	6.0	251	53	52		54
3	50	0127/37	1.0	1.38	758.8	88	82	651	6.0	249	54	52		56
3	55		1.05	1.36	762.0	86	83	697	6.5	250	55	52	46	55
3	100		1.05	1.36	765.3	88	83	693	6.5	250	57	53		56
4	65		1.05	1.36	768.5	89	84	675	6.5	244	58	54		57
4	70		1.05	1.36	771.8	90	84	667	6.5	251	58	54	49	59
4	75		1.15	1.5	775.3	90	84	668	7.0	252	60	54		61
4	80	0111	1.05	1.36	778.611	91	85	660	7.0	252	60	55	51	62
	Total θ		Avg. $\sqrt{\Delta P}$ .29732	Avg. ΔH 1.44375 / 1.4675	Total V_m 48.025	Avg. T_m 82.875		Avg. T_s 627.38	Max. vac	Min. Max.		Min. Max.		Max.

Comments: 550 / 13.6 > 375 / 82 > 13.3 > 600 / 80 > 12.98 > 625 - 12.7 > 650 - 12.4 > 675 - 12.1

13.5 > 600 / 90 > 13.27 > 625 - 12.92 > 650 - 12.63 > 675 - 12.35

Static -.025

SAMPLE RECOVERY AND INTEGRITY DATA FORM

Plant USATHAMA HWAAP Sample date 10/31/90

Sample location STACK Run number 5

Sample recovery person M. ILS Recovery date 11/1/90

Filter/thimble number(s) NA

MOISTURE

Impingers			Silica gel		
Final volume (wt)	262 (162) ml	(g) (100)	Final wt	319 g	g
Initial volume (wt)	200 ml	(g)	Initial wt	300 g	g
Net volume (wt)	62 ml	(g)	Net wt	19 g	g
Total moisture	81	(g)			

Color of silica gel 1/2 Blue 1/2 pink

Description of impinger water Clear colorless

RECOVERED SAMPLE

Blank filter container number	Blank FILTER	Sealed ✓
Blank XAD container number	Blank XAD	Sealed ✓
Filter/ : container number	TS-EXP-FILTER	Sealed ✓
Filter/ XAD 1 : container number	TS-EXP-XAD 1	Sealed ✓
Filter/ XAD 2 container number	TS-EXP-XAD 2	Sealed ✓
Filter/ XAD container number		Sealed

Description of particulate Very Fine Black

Condenser water and condenser water container number(s)		Liquid level marked ?
Front-half solvent rinse container number(s)	TS-EXP-FHS	Liquid level marked ? ✓
Impinger contents and back-half water rinse container number(s)	TS-EXP-BHW	Liquid level marked ? ✓
Back-half solvent rinse container number	TS-EXP-BHS	Liquid level marked ? ✓
Water blank container number	Blank BHW	Liquid level marked ? ✓
Solvent blank container number	Blank FHS	Liquid level marked ? ✓

Samples stored and locked Blank BHS ✓

Remarks

Date of laboratory custody

Laboratory personnel taking custody

Remarks

LABORATORY REPORTS

WESTON

ROY F. WESTON, INC.
Lionville Laboratory

****REVISION****

CLIENT: USATHAMA-HWAAP **SAMPLES RECEIVED:** 11-05-90
RFW #: 9011L465
W.O. #: 2281-08-02

INORGANIC NARRATIVE

The following is a summary of the quality control results and a description of any problems encountered during the analysis of this batch of samples:

1. The analytical methods applied by the laboratory in the analysis of air samples contained in this batch were derived from the Federal Register, 40 CRF, Part 60, Revised July 1, 1988, The Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, EPA - 600/4-84-041, May 1987, and NIOSH Manual of Analytical Methods, 2nd & 3rd Editions.

Jack R. Tuschall, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

1-14-91
Date

pas.21\i11-465r

ROY F. WESTON, INC.
GLOSSARY OF TERMS - INORGANIC REPORTS

DATA QUALIFIERS

U - Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* - Indicates that the original sample result is greater than 4x the spike amount added. The USEPA-CLP has determined that spike results on samples where this occurs may be unreliable and therefore, the control limits are not applicable.

ABBREVIATIONS

MB - Method or preparation blank.
MS - Matrix Spike.
MSD - Matrix Spike Duplicate.
REP - Sample Replicate.
LC - Indicates a method LCS or Blank Spike.
NC - Not calculable, result below the detection limit.

A suffix of -R and -S following these codes indicates a replicate and spike analysis respectively.

ANALYTICAL METAL METHODS

The analytical methods applied by the laboratory for the determination of drinking water is 5.2.1.

As : EPA 206.2	Se	:	EPA 270.2
Pb : EPA 239.2I	CP Scan	:	EPA 200.7
Hg : EPA 245.1	All Others	:	EPA 200.7
Tl : EPA 279.2	EP Leachates (except Hg)	:	200.7

NOTES

The laboratory is preparing a matrix spike at one per 20 frequency for TCLP samples of similar matrix. The Federal Register suggest that all matrix spikes be greater than 50%. A matrix duplicate is also prepared.

The USEPA-CLP has dropped control limits for silver and antimony due to documented difficulties in obtaining reliable results. WESTON Analytics has adopted the same policy.

Holding times for soil samples have not been promulgated by the USEPA.

For solid samples, all results are reported on a dry weight basis.

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 01/08/91

CLIENT: USATHAMA-HWAAP
WORK ORDER: 2281-08-02-0000

WESTON BATCH #: 9011L465

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	T1A-PART-FILT-20055	Particulate	1.7	MG	0.10
-002	T1A-PART-FHA	Particulate	2.3	MG	0.10
-003	T1B-PART-FILT-19947	Particulate	16.0	MG	0.10
-004	T1B-PART-FHA	Particulate	7.2	MG	0.10
-005	TIC-PART-FILT-19955	Particulate	2.4	MG	0.10
-006	TIC-PART-FHA	Particulate	2.2	MG	0.10
-007	T2-PART-FILT-19948	Particulate	2.6	MG	0.10
-008	T2-PART-FHA	Particulate	2.4	MG	0.10
-009	T3-PART-FILT-19964	Particulate	15.0	MG	0.10
-010	T3-PART-FHA	Particulate	7.2	MG	0.10
-011	BLANK-ACETON-01	Particulate	0.10 u	MG	0.10
-012	BLANK-FILT-19954	Particulate	0.10 u	MG	0.10
-013	T5-PART-FILT	Particulate	7.5	MG	0.10
-014	T5-PART-FHA	Particulate	3.4	MG	0.10

Roy F. Weston, Inc. - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
USATHAMA-HWAAP

DATE RECEIVED: 11/05/90 RFW LOT # :9011L465

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
T1A-PART-FILT-20055						
PARTICULATE	001	AI	90LPT030	10/22/90	11/28/90	12/01/90
T1A-PART-FHA						
PARTICULATE	002	AI	90LPT030	10/22/90	11/28/90	12/01/90
T1B-PART-FILT-19947						
PARTICULATE	003	AI	90LPT030	10/28/90	11/28/90	12/01/90
T1B-PART-FHA						
PARTICULATE	004	AI	90LPT030	10/28/90	11/28/90	12/01/90
TIC-PART-FILT-19955						
PARTICULATE	005	AI	90LPT030	10/30/90	11/28/90	12/01/90
TIC-PART-FHA						
PARTICULATE	006	AI	90LPT030	10/30/90	11/28/90	12/01/90
T2-PART-FILT-19948						
PARTICULATE	007	AI	90LPT030	10/23/90	11/28/90	12/01/90
T2-PART-FHA						
PARTICULATE	008	AI	90LPT030	10/23/90	11/28/90	12/01/90
T3-PART-FILT-19964						
PARTICULATE	009	AI	90LPT030	10/25/90	11/28/90	12/01/90
T3-PART-FHA						
PARTICULATE	010	AI	90LPT030	10/25/90	11/28/90	12/01/90

Roy F. Weston, Inc. - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
USATHAMA-HWAAP

DATE RECEIVED: 11/05/90 RFW LOT # :9011L465

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
BLANK-ACETON-01						
PARTICULATE	011	AI	90LPT030	10/22/90	11/28/90	12/01/90
BLANK-FILT-19954						
PARTICULATE	012	AI	90LPT030	10/22/90	11/28/90	12/01/90
T5-PART-FILT						
PARTICULATE	013	AI	90LPT030	10/31/90	11/28/90	12/01/90
T5-PART-FHA						
PARTICULATE	014	AI	90LPT030	10/31/90	11/28/90	12/01/90

WESTON

PARTICULATE SAMPLE ANALYSIS

Plant HWAP Sampling Location Boiler Stack Run # ONE A

Test Date 10/22/90 Test Period _____ Stack # _____ Process # _____

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams	Tare Avg.	Final (1) grams	Final (2) grams	Avg. Final Wt. grams	Wt. grams	Net Wt. grams
002 FHA	M-23	205	111.15225	111.15271	.1526	111.1559	111.1549	.1549	.0023	
001 FILTER$_1$ #	20055		.4173	.4175	.4174	0.4192	0.4190	.4191	.0017	
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
Comments										

Plant HWAP Sampling Location _____ Run # ONE B

Test Date 10/28/90 Test Period _____ Stack # _____ Process # _____

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams	Tare Avg.	Final (1) grams	Final (2) grams	Avg. Final Wt. grams	Wt. grams	Net Wt. grams
004 FHA	E-7	255	113.1935	113.1937	.1936	113.2046	113.2006	.2008	.0072	
003 FILTER$_1$ #	19947		.3975	.3976	.39755	0.4135	0.4135	.4135	.016	
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
Comments										

Plant HWAP Sampling Location _____ Run # ONE C

Test Date 10/30/90 Test Period _____ Stack # _____ Process # _____

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams	Tare Avg.	Final (1) grams	Final (2) grams	Avg. Final Wt. grams	Wt. grams	Net Wt. grams
006 FHA	T-27	235	117.9099	117.9101	.9100	117.9128	117.9120	.9123	.0022	
005 FILTER$_1$ #	19955		.3896	.3897	.38965	0.3921	.3920	.39205	.0024	
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										
Comments										

Acetone BLK										
WATER BLK										

CODE: FHA=Front half acetone wash BHW=Back half water(impinger contents + water wash) BHA-Back half acetone wash FH TOTAL=Front half catch weight TOTAL=Total train catch weight

Analyst [illegible] Date 11/28/90 Received by _____ Date _____

18.5°C 100. 004
21°C 100. 005

RFW 21-21-004/2-11/89

PARTICULATE SAMPLE ANALYSES

Plant HWAAP Sampling Location Boiler Stock Run # 2

Test Date 10/23/90 Test Period _____ Stack # _____ Process # _____

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams	Tare Avg.	Final (1) grams	Final (2) grams	Avg. Final Wt. grams	Wt. grams	Net Wt. grams
008 FHA	J-2	290	106.7141	106.7142	.71405	108.7170	108.7164	.7165	.00245	
007 FILTER$_1$ #	19948		.3972	.3972	.3972	0.3999	0.3994	.3998	.0026	.0026
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										

Comments _____

Plant HWAAP Sampling Location Boiler Stack Run # 3

Test Date 10/25/90 Test Period _____ Stack # _____ Process # _____

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams	Tare Avg.	Final (1) grams	Final (2) grams	Avg. Final Wt. grams	Wt. grams	Net Wt. grams
010 FHA	M-9	294	111.2732	111.2734	.0733	111.2805	111.2804	.2804	.00715	
009 FILTER$_1$ #	19969		.3586	.3585	.35855	.4035	.4035	.40345	.0149	.0149
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										

Comments _____

Plant HWAAP Sampling Location Boiler Stack Run # 5

Test Date 10/31 Test Period _____ Stack # _____ Process # _____

	Beaker #	Volume ml	Tare (1) grams	Tare (2) grams	Tare Avg.	Final (1) grams	Final (2) grams	Avg. Final Wt. grams	Wt. grams	Net Wt. grams
014 FHA	D-06	374	111.2531	111.2533	.2532	111.2566	111.2566	.2566	.00345	
013 FILTER$_1$ #	19945		.3947	.3945	.3946	.4027	.4020	.4021	.0075	
FILTER$_2$ #										
FH TOTAL										
BHW										
BHA										

Comments _____

011 Acetone BLK	F-10	234	106.9843	106.9843	.9843	106.9948	106.9840	.98405	.00025	
012 Water BLK	19954		.3919	.3918	.39185	0.3918	.3919	.3918	T.00025	

CODE: FNA=Front half acetone wash BHW=Back half water(impinger contents + water wash) BHA=Back half acetone wash FH TOTAL=Front half catch weight TOTAL=Total train catch weight

Analyst BDGwaltney Date 11/28/90 Received by _____ Date _____

RFW 21-21-004/2-11/89

ROY F. WESTON, INC.
Lionville Laboratory

CLIENT: USATHAMA-HWAAP
RFW #: 9011L465
W.O. #: 2281-08-06

SAMPLES RECEIVED: 11-05-90

EXPLOSIVE NARRATIVE

Samples have been prepared and analyzed according to USATHAMA Method LW02, Explosives in Soil, modified for the analysis MM-5 trains.

The following QA/QC control samples have been analyzed concurrently with each extraction batch. Abbreviations noted below have been used in the data summary.

Abbreviation		Description
BLK	=	Reagent blank analyzed to provide an indication of lab contamination and its' effect on reported analytical data.

Samples (soil or water) are spiked with target compounds to provide precision and accuracy data.

BS = Designates sample spiked with target compound.

Note: Spikes have been reported as result (% recovery).

Analysis Summary

Samples Collected : 10-31-90
Samples Prepared : 11-06-90, 11-09-90
Samples Analyzed : 11-10-90

/ Zohn Hall — 11-15-90

Jack R. Tuschall, Ph.D. — Date
Laboratory Manager
Lionville Analytical Laboratory

pas/org\exp.465

WESTON ANALYTICS
SOIL EXPLOSIVES DATA

RFW Batch Number: 9011L465 CLIENT: USATHAMA HWAAP W.O.# 2281-08-06 Page: 1

Sample Information	Client ID :	COMPOSITE #1	COMPOSITE #2	LAB QC BLK	LAB QC BS	LAB QC BLK	LAB QC BS
	RFW#:	(TS SAMPLE)	(BLANK)	SOLVENT	SOLVENT	WATER	WATER
	D.F.:	1	1	1	1	1	1
	Units:	ug	ug	ug	ug	ug	ug
RDX.....		5.06 G	1.82 G	0.098 U	96.7%	0.098 U	110%
2,4,6-TNT.....		13.6	0.768 U	0.192 U	89.1%	0.192 U	106%

COMPOSTITE #1 IS CONSISTED OF SAMPLES 9011L465-015,-016,-017,-018,-019,-020
COMPOSTITE #2 IS CONSISTED OF SAMPLES 9011L465-021,-022,-023,-024,-025

Roy F. Weston, Inc. - Lionville Laboratory
EXP ANALYTICAL DATA PACKAGE FOR
USATHAMA-HWAAP

DATE RECEIVED: 11/05/90 RFW LOT # :9011L465

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
COMPOSITE #1		AI		10/31/90	11/06/90	11/10/90
COMPOSITE #2		AI		10/31/90	11/09/90	11/10/90
LAB QC						
BLK	MB1	W		N/A	11/06/90	11/10/90
BLK BS	MB1 BS	W		N/A	11/06/90	11/10/90
BLK	MB1	W		N/A	11/09/90	11/10/90
BLK BS	MB1 BS	W		N/A	11/09/90	11/10/90

Custody Transfer Record/Lab Work Request

WESTON

WESTON Analytics Use Only: 9011L405

Client: USATHAMA HAWAAP
Work Order: 2251-08-06
Date Rec'd: 11/5/90 Date Due: 12/5/90
RFW Contact: MIKE COSMOS
Client Contact/Phone: Jeff O'Neill / Mike Cosmos

Refrigerator#	3
#/Type Container	1/G
Volume	
Preservative	
ANALYSES REQUESTED →	Particulate

WA Use Only Lab ID	Client ID/Description	Matrix	Date Collected	Particulate
001	T1A - PART - FILT - 20055	A	10/2?/90	X
002	T1A - PART - FHA			X
003	T1B - PART - FILT - 19947		10/28/90	X
004	T1B - PART - FHA			X
005	T1C - PART - FILT - 19955		10/30/90	X
006	T1C - PART - FHA			X
007	T2 - PART - FILT - 19948		10/23/90	X
008	T2 - PART - FHA			X
009	T3 - PART - FILT - 19964		10/25/90	X
010	T3 - PART - FHA		10/25/90	X
011	Blank - Acetone - 01		10/22/90	X
012	Blank - FILT - 19954		10/22/90	X
013	T5 - PART - FILT -		10/31/90	X
014	T5 - PART - FHA			X

Revision QC/Del = Std

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

Special Instructions: QC/Del - ~~Special~~ STD PARTICULATE AS per EPA Method 5
30 DAY TURN per Perry.

Item/Reason	Relinquished by	Received by	Date	Time	Item/Reason	Relinquished by	Received by	Date	Time
	Jack Miles		11/2/90						
all	Fed Ex	K Shepard	11/5/90	9:30					
OEXP	[illegible]	ES	11/6/90						

WESTON Analytics Use Only

Samples Were: 1 (Shipped) or Hand-Delivered
NOTES:

2 (Ambient) or Chilled
NOTES:

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

4 (Properly) Preserved (Y) N
NOTES:

5 Received Within Holding Times (Y) N
NOTES:

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

E Fisher 11/5/90

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

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

RFW 21-21-001/A-12/88

C# N/A
R# N/A

QC/Del = STD per Perry.
Client requested QuickTurn for OEXPs. Long as 30 Day per Perry.

7-115

Custody Transfer Record/Lab Work Request

WESTON

WESTON Analytics Use Only
9011L46.5

Client USATHAMA HWAAP
Work Order 228/-08-06
Date Rec'd. 11/5 FIC Date Due 12/5/90
RFW Contact Mike Cosmos / Jeff O'Neill
Client Contact/Phone

WA Use Only Lab ID	Client ID/Description	Matrix	Date Collected	Refrigerator#	#/Type Container	Volume	Preservative	ANALYSES REQUESTED								
				2	1gal	known		TNT ROX								
015	TS-EXP-FHS	A	10/31/90					X								
016	TS-EXP-FILTER							X								
017	TS-EXP-401							X								
018	TS-EXP-22							X								
019	TS-EXP-HW							X								
080	TS-EXP-BHS							X								
021	Blank FHS		10/31/90					X								
022	Blank FZT							X								
023	Blank XAD							X								
088	Blank BHW							X								
029	Blank BHS							X								
								✓								

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

Special Instructions: QC/Rel - ~~Spec~~ per Perry SJD Test 5 was spiked with 3.7 lb TNT Burn rate = 0.3 lbs/hr See George Perry for Analytical instructions

Item/Reason	Relinquished by	Received by	Date	Time	Item/Reason	Relinquished by	Received by	Date	Time
	Jack Mills		11/6/90						

WESTON Analytics Use Only

Samples Were:
1 Shipped or Hand-Delivered
NOTES:

2 Ambient or Chilled
NOTES:

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

4 Properly Preserved Y N
NOTES:

5 Received Within Holding Times Y N
NOTES:

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

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

Discrepancies Between Sample Labels and COC Record? Y N
NOTES:

SAMPLE CALCULATIONS

SAMPLE CALCULATIONS

Client USATHAMA

Plant _____

Test Run No. 1B

Test Date 10/22/90

Test Location HAWTHORNE, NEVADA

Test Period 1601-1720

1. Volume of dry gas sampled at standard conditions (68°F, 29.92 in. Hg), dscf.

$$V_{m(std)} = \frac{17.64 \times Y \times V_m \times \left(P_b + \frac{\overline{\Delta H}}{13.6}\right)}{(\overline{T}_m + 460)}$$

$$V_{m(std)} = \frac{17.64 \times 1.008 \times 41.66 \times \left(25.77 + \frac{0.85188}{13.6}\right)}{(80.41 + 460)} =$$

35.410

Where:

$V_{m(std)}$ = Volume of gas sample measured by the dry gas meter, corrected to standard conditions, dscf.

V_m = Volume of gas sample measured by the dry gas meter at meter conditions, dcf.

P_b = Barometric pressure, in. Hg.

$\overline{\Delta H}$ = Average pressure drop across the orifice meter, in. H_2O.

$\overline{T}_m$ = Average dry gas meter temperature, °F.

Y = Dry gas meter calibration factor.

17.64 = Factor that includes ratio of standard temperature (528°R) to standard pressure (29.92 in. Hg), °R/in. Hg.

13.6 = Specific gravity of mercury.

2. Volume of water vapor in the gas sample corrected to standard conditions, scf.

$V_{w(std)} = (0.04707 \times V_{wc}) + (0.04715 \times W_{wsg})$

$V_{w(std)} = (0.04707 \times 62) + (0.04715 \times 14) = 3.58$

Where:

$V_{w(std)}$ = Volume of water vapor in the gas sample corrected to standard conditions, scf.

V_{wc} = Volume of liquid condensed in impingers, ml.

W_{wsg} = Weight of water vapor collected in silica gel, g.

0.04707 = Factor which includes the density of water (0.002201 lb/ml), the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant 21.85 (in. Hg) $(ft^3)/(lb\text{-mole})(^oR)$; absolute temperature at standard conditions (528^oR), absolute pressure at standard conditions (29.92 in. Hg), ft^3/ml.

0.04715 = Factor which includes the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant 21.85 (in. Hg) $(ft^3)/(lb\text{-mole})(^oR)$, absolute temperature at standard conditions (528^oR), absolute pressure at standard conditions (29.92 in. Hg), and 453.6 g/lb, ft^3/g.

3. Moisture content.

$$B_{ws} = \frac{V_{w(std)}}{V_{w(std)} + V_{m(std)}}$$

$$B_{ws} = \frac{3.58}{3.58 + 35.410} = 0.092$$

Where:

B_{ws} = Proportion of water vapor, by volume, in the gas stream, dimensionless.

4. Mole fraction of dry gas.

$$M_d = 1 - B_{ws}$$

$$M_d = 1 - 0.092 = 0.908$$

Where:

M_d = Mole fraction of dry gas, dimensionless

5. Dry molecular weight of gas stream, lb/lb-mole.

$MW_d = 0.440(\%\ CO_2) + 0.320(\%\ O_2) + 0.280(\%N_2 + \%\ CO)$

$MW_d = (0.440 \times 8.7) + (0.320 \times 9.3) + (0.280 (82 + 0.0$

$= 29.76$

Where:

MW_d	=	Dry molecular weight, lb/lb-mole.
$\%CO_2$	=	Percent carbon dioxide by volume, dry basis.
$\%O_2$	=	Percent oxygen by volume, dry basis.
$\%N_2$	=	Percent nitrogen by volume, dry basis.
%CO	=	Percent carbon monoxide by volume, dry basis.
0.440	=	Molecular weight of carbon dioxide, divided by 100.
0.320	=	Molecular weight of oxygen, divided by 100.
0.280	=	Molecular weight of nitrogen or carbon monoxide, divided by 100.

6. Actual molecular weight of gas stream (wet basis), lb/lb-mole.

$MW_s = (MW_d \times M_d) + 18\ (1 - M_d)$

$MW_s = (29.76 \times 0.908) + 18\ (1 - 0.908)$

$= 28.68$

Where:

MW_s	=	Molecular weight of wet gas, lb/lb-mole.
18	=	Molecular weight of water, lb/lb-mole.

7. Average velocity of gas stream at actual conditions, ft/sec.

$$v_s = 85.49 \times C_p \times (\sqrt{\Delta \bar{p}})_{avg} \times \left[\frac{T_s\ (avg)}{P_s \times MW_s}\right]^{\frac{1}{2}}$$

v_s = 85.49 x 0.84 x 0.212756 x $\left[\frac{939}{25.77 \times 28.68}\right]$

= 17.22

Where:

v_s = Average gas stream velocity, ft/sec.

85.49 = Pitot tube constant, ft/sec x

$\left[\frac{(lb/lb\text{-}mole)(in.Hg)}{(^oR)\ (in.\ H_2O)}\right]^{\frac{1}{2}}$

C_p = Pitot tube coefficient, dimensionless.

T_s = Absolute gas stream temperature, ^oR. = $T_s, ^oF + 460$

P_s = Absolute gas stack pressure, in. Hg. = $P_b + \frac{P_{static}}{13.6}$

Δp = Velocity head of stack gas, in. H_2O

8. Average gas stream volumetric flow rate at actual conditions, wacf/hr.

$Q_{s(act)}$ = 3,600 x v_s x A_s

= 3,600 x 17.22 x 0.79 = 48900 WACF/hr

815 WACF/min

Where:

$Q_{s(act)}$ = Volumetric flow rate of wet stack gas at actual conditions, wacf/hr.

A_s = Cross-sectional area of stack, $ft.^2$

9. Average gas stream dry volumetric flow rate at standard conditions, dscf/hr.

$Q_{s(std)}$ = 17.64 x M_d x $\frac{P_s}{T_s}$ x $Q_{s(act)}$

= 17.64 x 0.908 x $\frac{25.77}{939}$ x 48900 = 21500 dscf

360 dscf/m.

Where:

$Q_{s(std)}$ = Volumetric flow rate of dry stack gas at standard conditions, dscf/hr.

10. Isokinetic variation calculated from intermediate values, percent.

$$I = \frac{17.327 \times T_s \times V_{m(std)}}{V_s \times \theta \times P_s \times M_d \times (D_n)^2}$$

$$I = \frac{17.327 \times 939 \times 35.41}{17.22 \times 80 \times 25.77 \times 0.908 \times (0.430)^2} = 96.6$$

Where:

I = Percent of isokinetic sampling.

θ = Total sampling time, minutes.

D_n = Diameter of nozzle, inches.

17.327 = Factor which includes standard temperature (528°R), standard pressure (29.92 in.Hg), the formula for calculating area of circle $\frac{D^2}{4}$, conversion of square feet to square inches (144), conversion of seconds to minutes (60), and conversion to percent (100), $\frac{(\text{in. Hg})\ (\text{in}^2)\ (\text{min})}{(^\circ\text{R})\ (\text{ft}^2)\ (\text{sec})}$

11. Particulate concentration, gr/dscf.

$$C_1 = 15.432 \times \frac{M_t}{V_{m(std)}}$$

$$C_1 = 15.432 \times \frac{0.0232}{35.410} = 0.0101$$

Where:

C_1 = Particulate concentration, gr/dscf.

M_t = Total weight of particulate caught by train, g.

15.432 = Conversion factor of gr/g.

12. Particulate concentration, gr/wacf.

$$C_2 = C_1 \times \frac{Q_{s(std)}}{Q_{s(act)}} = 0.0101 \times \frac{360}{815} = 0.0045$$

Where:

C_2 = Particulate concentration, gr/wacf.

13. Particulate mass emission rate, lb/hr.

PMR_t = $0.000142857 \times C_1 \times Q_{s(std)}$

= $0.000142857 \times 0.0101 \times 21500 = 0.031$

Where:

PMR_t = Particulate mass emission rate, lb/hr.

0.000142857 = Conversion factor relating grains to pounds (7,000), lb/gr.

14. Conversion Factors:

From	To	Multiply by
in.	mm.	25.40
ft.	m.	0.3048
$ft.^2$	$m.^2$	0.092903
$ft.^3$	$m.^3$	0.028317
$gr/ft.^3$	$g/m.^3$	2.28833
lbs/hr.	g/hr.	453.59

Temperature

$^oC = 5/9 (F-32)$

$^oR = {}^oF + 460$

$^oK = {}^oC + 273$

(2,4,6 Trinitrotoluene - TNT)

SEMI-VOLATILE ORGANICS

SAMPLING TRAIN

SEMI-VOLATILE ORGANIC COMPOUNDS

SAMPLE CALCULATION

CLIENT USATHAMA **TEST RUN** 5

PLANT _____ **TEST DATE** 10-31-90

TEST LOCATION HAWTHORNE, NEVADA **TEST PERIOD** 2335-0111

(Refer to EPA Method 5 Sample Calculation for abbreviations and definition of terms.)

1. **Volume of dry gas sampled at standard conditions (68°F, 29.92 IN.Hg.), dscf.**

$$Vm\ (std) = \frac{17.64 \times Y \times Vm \times (Pb + \Delta H/13.6)}{(Tm + 460)}$$

$$Vm\ (std) = \frac{17.64 \times 1.00 \times 48.085 \times (25.54 \quad \frac{1.1468}{13.6})}{(82.88 + 460)}$$

2. **Semi-Volatile Organic Compound (SVOC) concentration, lb/dscf**

$$Cl_{SVOC} = \frac{W_{SVOC} \times 2.2046 \times 10^{-6}}{Vm\ (std)} =$$

$$Cl_{SVOC} = \frac{0.0136 \times 2.2046 \times 10^{-6}}{40.037} = 7.49 \times 10^{-10}$$

Where:

Cl_{SVOC} = SVOC concentration, lb/dscf

W_{SVOC} = Total weight of SVOC caught in train, mg

3. VOC concentration, ppm by volume

$C2_{SVOC} = Cl_{SVOC} \times \frac{385.35}{mw} \times 10^{6}$

$C2_{SVOC} = 7.49 \times 10^{-10} \times \frac{385.35}{227.13} \times 10^{6} = 1.27 \times 10^{-3}$

Where:

$C2_{SVOC}$ = Molecular weight of specific SVOC, lb/lb-mole

4. SVOC mass emission rate, lb/hr

$MER_{SVOC} = Cl_{SVOC} \times Qs$ (std)

Where: $7.49 \times 10^{-10} \times 27200 = 2.04 \times 10^{-5}$ lbs/hr

MER_{SVOC} = Mass emission rate of specific SVOC, lb/hr

EQUIPMENT CALIBRATIONS

Calibrator CM

POSTTEST DRY GAS METER CALIBRATION DATA FORM

Date 12/19/90 Meter box number 12 Plant USTHAMA

Barometric pressure, P_b = 29.95 In. Hg Dry gas meter number 6898070 Pretest Y 1.008

Setting	Gas Volume		Temperature				Time (θ), min.	Vacuum Setting, in. Hg.	Y_i	Y_i = $\frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
Orifice Manometer (ΔH) in. H_2O	Wet test meter (V_w) ft^3	Dry gas meter (V_d) ft^3	Wet test meter (t_w) °F	Dry gas meter Inlet (td_i) °F	Dry gas meter Outlet (td_o) °F	Dry gas meter Average (t_d) °F				
1.69	10	484.958 / 494.954	67	70,74,76	68,69,70	71	14.5	9.0	1.007	
1.69	10	445.091 / 487.958	67.5	75,78,79	71,72,73	74.5	14.6	9.0	.9958	
1.69	10	505.264 / 495.091	68	78,79,80	73,74,74	76	14.6	9.0	.9937	
									Y = .9988	

If there is only one thermometer on the dry gas meter, record the temperature under t_d.

V_w = Gas volume passing through the wet test meter, ft^3.

V_d = Gas volume passing through the dry gas meter, ft^3.

t_w = Temperature of the gas in the wet test meter, °F.

td_i = Temperature of the inlet gas of the dry gas meter, °F.

td_o = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, $\frac{td_i + td_o}{2}$, °F. $\Delta H@_1 = \frac{0.0317 \Delta H}{P_b(t_d+460)} \left[\frac{(t_w+460)\theta}{V_w}\right]^2$

ΔH = Pressure differential across orifice, in. H_2O.

Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y ± 0.05Y.

P_b = Barometric pressure, in. Hg.

θ = Time of calibration run, min.

Long calibration required? Yes _____ No ✓

Calibrator PM

POSTTEST DRY GAS METER CALIBRATION DATA FORM

Date 12/18/90 Meter box number 14 Plant USTHRRIA

Barometric pressure, P_b = 29.48 In. Hg Dry gas meter number 6848169 Pretest Y .9982

Setting	Gas Volume		Temperature				Time (θ), min.	Vacuum Setting, in. Hg.	Y_i	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
Orifice Manometer (ΔH) in. H_2O	Wet test meter (V_w) ft^3	Dry gas meter (V_d) ft^3	Wet test meter (t_w) °F	Dry gas meter Inlet (td_i) °F	Dry gas meter Outlet (td_o) °F	Dry gas meter Average (t_d) °F				
1.15	10	795.392 788.237	66.5	70, 73, 76	67, 69, 70	71	17.45	2.0	.9963	
1.15	10	808.566 798.392	68	74, 76, 78	70, 71, 72	73.5	17.6	2.0	.9902	
1.15	10	818.808 808.566	68.5	74, 76, 78	72, 73, 74	75	17.65	2.0	.9855	
									Y = .9886	

If there is only one thermometer on the dry gas meter, record the temperature under t_d.

V_w = Gas volume passing through the wet test meter, ft^3.

V_d = Gas volume passing through the dry gas meter, ft^3.

t_w = Temperature of the gas in the wet test meter, °F.

td_i = Temperature of the inlet gas of the dry gas meter, °F.

td_o = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, $\frac{td_i + td_o}{2}$, °F. $\Delta H@_1 = \frac{0.0317 \Delta H}{P_b(t_d + 460)} \left[\frac{(t_w + 460)\theta}{V_w}\right]^2$

ΔH = Pressure differential across orifice, in. H_2O.

Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y ± 0.05Y.

P_b = Barometric pressure, in. Hg.

θ = Time of calibration run, min

Long calibration required? Yes ✓ No _____

LONG/PRE DRY GAS METER CALIBRATION DATA FORM

Date 12/19/90 Meter Box Number 14 Plant USTHAMA

Barometric pressure, P_b = 29.95 In. Hg Calibrator PAT Comments

Setting: Orifice manometer (Δ H) in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperatures: Wet test meter (t_w), °F	Temperatures: Dry gas meter: Inlet (td_i), °F	Temperatures: Dry gas meter: Outlet (td_o), °F	Temperatures: Dry gas meter: Avg[a] (t_d) °F	Time (θ), min	Y_i	ΔH @, in. H_2O
0.5	5	832.710 827.687	67	70, 71, 72	69, 70, 70	70	12.9	.9998	1.845
1.0	5	838.897 833.729	67.5	74, 75, 76	71, 71, 72	73	9.3	.9924	1.911
1.5	10	849.997 839.812	68	77, 79, 80	72, 73, 74	26.	15.45	.9930	1.971
2.0	10	861.227 851.027	68.5	79, 81, 82	74, 75, 75	77.5	13.45	.9922	1.989
3.0	10	872.508 862.248	68.5	80, 83, 85	75, 76, 77	79	11.05	.9867	2.009
							Avg	Y .9928	1.945 ΔH @

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d.

(ΔH) in. H_2O	$\frac{\Delta H}{13.6}$	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d\left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$	$\Delta H@i = \frac{0.0317\,\Delta H}{P_b(t_d + 460)}\left[\frac{(t_w + 460)\,\theta}{V_w}\right]^2$
0.5	0.0368	$\frac{(5)(29.95)(70+460)}{(5.023)(29.95+.0368)(67+460)}$	$\frac{(.0317)(.5)}{(29.95)(70+460)}\left[\frac{(67+460)(12.9)}{5}\right]^2 = 1.845$
1.0	0.0735	$\frac{(5)(29.95)(73+460)}{(5.078)(29.95+.0735)(67.5+460)}$	$\frac{(.0317)(1.0)}{(29.95)(73+460)}\left[\frac{(67.5+460)(9.3)}{5}\right]^2 = 1.911$
1.5	0.110	$\frac{(10)(29.95)(76+460)}{(10.185)(29.95+.110)(68+460)}$	$\frac{(.0317)(1.5)}{(29.95)(76+460)}\left[\frac{(68+460)(15.45)}{10}\right]^2 = 1.971$
2.0	0.147	$\frac{(10)(29.95)(77.5+460)}{(10.200)(29.95+.147)(68.5+460)}$	$\frac{(.0317)(2.0)}{(29.95)(77.5+460)}\left[\frac{(68.5+460)(13.45)}{10}\right]^2 = 1.989$
3.0	0.221	$\frac{(10)(29.95)(79+460)}{(10.260)(29.95+.221)(68.5+460)}$	$\frac{(.0317)(3.0)}{(29.95)(79+460)}\left[\frac{(68.5+460)(11.05)}{10}\right]^2 = 2.009$

TYPE S PITOT TUBE INSPECTION DATA FORM

Pitot tube #1

Pitot tube assembly level? ✓ yes _____ no

Pitot tube openings damaged? _____ yes (explain below) ✓ no

α_1 = 1 ° (<10°), α_2 = 0 ° (<10°), β_1 = 0 ° (<5°),

β_2 = 1 ° (<5°)

γ = 1 °, θ = 0 °, A = .026 cm (in.)

z = A sin γ = .016 cm (in.); <0.32 cm (<1/8 in.),

w = A sin θ = 0 cm (in.); <.08 cm (<1/32 in.)

P_A .463 cm (in.) P_b .463 cm (in.)

D_t = _____ cm (in.)

Comments: Inspected 6/22/90 Andre Williams

Calibration required? _____ yes ✓ no

TYPE S PITOT TUBE INSPECTION DATA FORM

PITOT TUBE P2

Pitot tube assembly level? ✓ yes _____ no

Pitot tube openings damaged? ____ yes (explain below) ✓ no

α_1 = 4 ° (<10°), α_2 = 0 ° (<10°), β_1 = 3 ° (<5°),

β_2 = 2 ° (<5°)

γ = 1 °, θ = 1 °, A = 0.870 cm (in.)

z = A sin γ = .015 cm (in.); <0.32 cm (<1/8 in.),

w = A sin θ = .030 cm (in.); <.08 cm (<1/32 in.)

P_A .436 cm (in.) P_b .436 cm (in.)

D_t = .375 cm (in.)

Comments: INSPECTED 5/17/90 [signature]

Calibration required? ____ yes ✓ no

WESTON
DESIGNERS CONSULTANTS

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date: 2-10-90 Thermocouple Number: Nutech 14

Ambient Temperature: 48 °F Barometric Pressure: 29.97 in. Hg

Calibrator: K.H. Reference: Mercury-in-glass ✓

Other: _____

Reference Point Number	Source[a] (Specify)	Reference Thermometer Temperature, °F	Thermocouple Potentiometer Temperature, °F	Temperature Difference[b] %
	HOT. OIL	403°F	402 °F	.11 %
	AMBIENT	67 °F	65 °F	.38 %
	ICE Bath	32 °F	32 °F	0 %

[a] Type of calibration system used.

[b] $\left[\frac{\text{(ref temp, °F + 459.67) - (test thermom temp, °F + 459.67)}}{\text{ref temp, °F + 459.67}}\right]$ 100 ≤ 1.5%

WESTON
DESIGNERS CONSULTANTS

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date: 2-10-90 Thermocouple Number: NUTECH 12

Ambient Temperature: 48 °F Barometric Pressure: 29.97 in. Hg

Calibrator: K.H. Reference: Mercury-in-glass ✓

Other: _____

Reference Point Number	Source[a] (Specify)	Reference Thermometer Temperature, °F	Thermocouple Potentiometer Temperature, °F	Temperature Difference[b] %
	HOT OIL	398 °F	397 °F	.11 %
	AMBIENT	67 °F	68 °F	.19 %
	ICE Bath	32 °F	33 °F	.20 %

[a] Type of calibration system used.

[b] $\left[\frac{(\text{ref temp, °F} + 459.67) - (\text{test thermom temp, °F} + 459.67)}{\text{ref temp, °F} + 459.67}\right] 100 \leq 1.5\%$

NOZZLE CALIBRATION DATA FORM

Date 10/21/90 Calibrated by Jack Mills

Nozzle identification number	Nozzle diameter, inches[a]			ΔD,[b]	D_{avg}[c]
	D_1	D_2	D_3		
41AA	.402	.401	.403	.002	.402
51D	.499	.500	.500	.001	.500
41K	~~.485~~ .483	.483	.485	.002	.484
41G	.430	.430	.429	.001	.430

Where:

[a] $D_{1,2,3}$ = three different nozzle diamters, inches; each diameter must be measured to nearest 0.001 in.

[b] ΔD = maximum difference between any two diameters, inches. ΔD must be $\leq$ 0.004 in.

[c] D_{avg} = nozzle diameter = average of D_1, D_2 and D_3.

METER BOX CALIBRATION DATA AND CALCULATION FORM

Date 12-18-89 Meter Box Number UNIECH 12

Barometric pressure, P_b = 30.30 in. Hg Calibrated by K.H.

Orifice manometer setting (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperatures: Wet test meter (t_w), °F	Temperatures: Dry gas meter: Inlet (t_{d_i}), °F	Temperatures: Dry gas meter: Outlet (t_{d_o}), °F	Temperatures: Dry gas meter: Avg[a] (t_d), °F	Time (θ), min	Y_i	$\Delta H@$ in.
0.5	5								
1.0	5								
1.5	10	194.225 189.089	58	72 76 77	65 67 68	71	15.5	1.008	1.90
2.0	10								
3.0	10								
4.0	10								
							Avg	Y 1.008	$\Delta H@$ 1.90

ΔH, in. H_2O	$\frac{\Delta H}{13.6}$	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d (P_b + \frac{\Delta H}{13.6}) (t_w + 460)}$	$\Delta H@_i = \frac{0.0317 \Delta H}{P_b (t_d + 460)} \left[\frac{(t_w + 460)\theta}{V_w} \right]$
.5	0.0368		
1.0	0.0735		
.5	0.110	$\frac{(10)(30.3)(71+460)}{(10.136)(30.3+.110)(58+460)}$	$\frac{(.0317)(1.5)}{(30.3)(71+460)} \cdot \left[\frac{(58+960)(15.5)}{10} \right]^2 = 1.9$
.0	0.147		
3.0	0.221		
.0	0.294		

If there is only one thermometer on the dry gas meter, record the temperature under t_d.

NuTech

C A L I B R A T I O N S H E E T

Customer : WESTON Serial : 80242
Date : 06-06-89

CALCULATION DATA FOR RUN :	1	2	3
1. Barometric Pressure, P(B):	29.89	29.89	29.89
2. Orifice Setting, Delta H :	2.00	0.75	6.00
3. Finial Reading (Test) :	654.504	665.677	676.968
4. Initial Reading (Test) :	643.946	655.170	666.537
5. Volume, V(T) Cubic Feet :	10.558	10.507	10.431
6. Temp Initial T(T(I)) F :	73	74	74
7. Temp Finial T(T(F)) F :	74	74	74
8. Finial Reading (Box) :	17.334	28.541	39.793
9. Initial Reading (Box) :	6.800	18.000	29.403
10. Volume, V(B) Cubic Feet :	10.534	10.541	10.390
11. Temp Initial T(B(I)) F :	76	80	81
12. Temp Final T(B(F)) F :	80	81	85
13. Elapsed Time, Minutes :	14.0	22.0	8.0
Delta H(a) :	1.9731	1.8398	1.9656
Gamma :	1.0058	1.0071	1.0060

Calibration Performed By : William D. Ballard

Date 12-22-89 Meter Box Number NUTECH

Barometric pressure, P_b = 30.42 in. Hg Calibrated by K.A.

Orifice manometer setting (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperatures: Wet test meter (t_w), °F	Temperatures: Dry gas meter: Inlet (t_{d_i}), °F	Temperatures: Dry gas meter: Outlet (t_{d_o}), °F	Temperatures: Dry gas meter: Avg[a] (t_d), °F	Time (θ), min	Y_i	$\Delta H@_i$
0.5	5								
1.0	5								
1.5	10	70.319 60.146	59	70 73 76	66 66 68	70	15.6	1.000	1.9
2.0	10								
3.0	10								
4.0	10								
							Avg	Y 1.000	Δ 1.9

ΔH, in. H_2O	$\frac{\Delta H}{13.6}$	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d (P_b + \frac{\Delta H}{13.6}) (t_w + 460)}$	$\Delta H@_i = \frac{0.0317 \Delta H}{P_b (t_d + 460)} \left[\frac{(t_w + 460)}{V_w}\right]$
0.5	0.0368		
1.0	0.0735		
1.5	0.110	$\frac{(10)(30.42)(70+460)}{(10.173)(30.42+.110)(59+460)}$	$\left[\frac{(.0317)(1.5)}{(30.42)(70+460)}\right] \cdot \left[\frac{(59+460)}{10}\right]^2 =$
2.0	0.147		
3.0	0.221		
4.0	0.294		

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d.

CALIBRATION SHEET

Customer : WESTON Serial : 80244
Date : 11-27-89

CALCULATION DATA FOR RUN :	1	2	3
1. Barometric Pressure, P(B):	30.14	30.14	30.14
2. Orifice Setting, Delta H :	2.00	0.75	6.00
3. Finial Reading (Test) :	292.470	303.053	314.207
4. Initial Reading (Test) :	281.520	292.710	303.750
5. Volume, V(T) Cubic Feet :	10.950	10.343	10.457
6. Temp Initial T(T(I)) F :	70	71	71
7. Temp Finial T(T(F)) F :	71	71	72
8. Finial Reading (Box) :	25.762	36.275	47.300
9. Initial Reading (Box) :	14.908	26.000	36.955
10. Volume, V(B) Cubic Feet :	10.854	10.275	10.345
11. Temp Initial T(B(I)) F :	72	75	77
12. Temp Final T(B(F)) F :	76	76	82
13. Elapsed Time, Minutes :	14.0	22.0	8.0
Delta H(a) :	1.8122	1.8791	1.9340
Gamma :	1.0106	1.0133	1.0112

Calibration Performed By : William O. Ballard

APPENDIX C

CONTINUOUS EMISSIONS MONITORING DATA

- TEST T-1a -- 22 OCTOBER 1990
- TEST T-1b -- 27 OCTOBER 1990
- TEST T-1c -- 30 OCTOBER 1990
- TEST T-2 -- 23 OCTOBER 1990
- TEST T-3 -- 25 OCTOBER 1990
- TEST T-5 -- 1 NOVEMBER 1990
- TEST T-9 -- 19 NOVEMBER 1990

TEST T-1a

22 OCTOBER 1990

TITLE: TEST ONE - FUEL OIL
NOTE : TEST 1A OIL BURN CEM DATA

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
22 Oct 90	11:18:00	23.1	8.1	2.9	99.4	9.2
22 Oct 90	11:19:00	24.8	8.3	3.2	95.5	9.1
22 Oct 90	11:20:00	24.1	8.3	3.6	95.4	9.0
22 Oct 90	11:21:00	23.5	8.3	4.0	94.9	9.0
22 Oct 90	11:22:00	28.4	8.4	4.2	94.1	9.0
22 Oct 90	11:23:00	29.7	8.4	4.6	93.0	9.0
22 Oct 90	11:24:00	30.3	8.4	4.5	93.4	9.0
22 Oct 90	11:25:00	24.6	8.4	4.5	93.7	9.0
22 Oct 90	11:26:00	26.7	8.3	4.4	94.5	9.0
22 Oct 90	11:27:00	25.7	8.3	4.2	95.1	9.0
22 Oct 90	11:28:00	26.2	8.3	4.0	95.8	9.0
22 Oct 90	11:29:00	24.6	8.3	3.8	95.7	9.1
22 Oct 90	11:30:00	22.5	8.3	3.7	96.6	9.1
22 Oct 90	11:31:00	23.5	8.2	3.5	97.8	9.1
22 Oct 90	11:32:00	23.3	8.2	3.5	97.0	9.2
22 Oct 90	11:33:00	20.5	8.2	3.4	97.0	9.1
22 Oct 90	11:34:00	20.9	8.2	3.2	96.9	9.2
22 Oct 90	11:35:00	20.8	8.2	2.8	98.2	9.2
22 Oct 90	11:36:00	20.3	8.1	2.6	99.3	9.3
22 Oct 90	11:37:00	16.6	8.1	2.4	98.5	9.2
22 Oct 90	11:38:00	18.5	8.1	2.3	98.8	9.3
22 Oct 90	11:39:00	19.9	8.1	2.3	98.3	9.3
22 Oct 90	11:40:00	18.1	8.0	2.8	99.3	9.3
22 Oct 90	11:41:00	19.8	8.1	3.0	98.2	9.3
22 Oct 90	11:42:00	20.6	8.1	3.2	97.6	9.3
22 Oct 90	11:43:00	18.4	8.0	3.2	99.2	9.3
22 Oct 90	11:44:00	21.1	8.0	3.2	98.5	9.3
22 Oct 90	11:45:00	18.9	8.1	3.1	97.4	9.3
22 Oct 90	11:46:00	19.0	8.1	2.8	96.2	9.2
22 Oct 90	11:47:00	22.4	8.2	2.5	95.5	9.2
22 Oct 90	11:48:00	21.8	8.2	2.3	95.9	9.2
22 Oct 90	11:49:00	24.8	8.2	2.2	94.3	9.2
22 Oct 90	11:50:00	22.5	8.2	2.0	95.0	9.2
22 Oct 90	11:51:00	23.5	8.3	1.9	94.7	9.2
22 Oct 90	11:52:00	20.6	8.2	1.8	94.1	9.2
22 Oct 90	11:53:00	20.1	8.2	1.9	94.4	9.2
22 Oct 90	11:54:00	22.6	8.2	1.9	94.2	9.2
22 Oct 90	11:55:00	19.4	8.2	1.8	94.9	9.2
22 Oct 90	11:56:00	19.2	8.1	1.8	96.7	9.3
22 Oct 90	11:57:00	18.0	8.1	1.7	96.0	9.3
22 Oct 90	11:58:00	22.2	8.2	1.6	94.7	9.3
22 Oct 90	11:59:00	20.6	8.2	1.6	96.2	9.3
22 Oct 90	12:00:00	20.4	8.2	1.7	95.2	9.3
22 Oct 90	12:01:00	22.0	8.2	1.9	95.4	9.3
22 Oct 90	12:02:00	20.7	8.1	1.8	96.5	9.3
22 Oct 90	12:03:00	19.8	8.1	16.7	96.0	9.3
22 Oct 90	12:04:00	22.7	8.1	39.6	96.4	9.3
22 Oct 90	12:05:00	20.6	8.1	5.6	97.4	9.3
22 Oct 90	12:06:00	20.9	8.1	3.2	96.7	9.3
22 Oct 90	12:07:00	21.3	8.1	2.3	97.6	9.3
22 Oct 90	12:08:00	19.4	8.1	1.8	97.9	9.3
22 Oct 90	12:09:00	20.5	8.1	1.5	97.2	9.3
22 Oct 90	12:10:00	20.8	8.1	1.4	98.9	9.3
22 Oct 90	12:11:00	20.5	8.2	1.5	96.1	9.3
22 Oct 90	12:12:00	21.7	8.3	1.7	93.8	9.2
22 Oct 90	12:13:00	23.5	8.3	1.6	93.0	9.2
22 Oct 90	12:14:00	23.6	8.3	1.4	92.0	9.2
22 Oct 90	12:15:00	23.1	8.3	1.0	92.7	9.2
22 Oct 90	12:16:00	26.9	8.4	0.7	91.3	9.1
22 Oct 90	12:17:00	24.5	8.4	0.5	91.3	9.1
22 Oct 90	12:18:00	29.3	8.4	0.5	90.1	9.1
22 Oct 90	12:19:00	27.3	8.4	0.7	90.3	9.1
22 Oct 90	12:20:00	24.4	8.4	0.8	90.9	9.1
22 Oct 90	12:21:00	25.9	8.4	1.0	90.6	9.1
22 Oct 90	12:22:00	25.2	8.4	1.0	91.6	9.1
22 Oct 90	12:23:00	25.3	8.3	1.0	92.8	9.2
22 Oct 90	12:24:00	24.0	8.3	0.9	92.4	9.2
22 Oct 90	12:25:00	24.3	8.3	0.8	91.9	9.2
22 Oct 90	12:26:00	25.9	8.4	0.7	91.7	9.1
22 Oct 90	12:27:00	28.8	8.4	0.6	92.7	9.1
22 Oct 90	12:28:00	24.8	8.4	0.4	93.5	9.1
22 Oct 90	12:29:00	27.5	8.3	42.4	94.6	9.2

22 Oct 90	12:30:00	26.1	8.4	7.7	93.4	9.1
22 Oct 90	12:31:00	25.8	8.4	3.0	92.9	9.1
22 Oct 90	12:32:00	24.9	8.3	1.9	94.0	9.2
22 Oct 90	12:33:00	26.9	8.3	1.4	92.3	9.2
22 Oct 90	12:34:00	25.2	8.3	1.1	92.9	9.2
22 Oct 90	12:35:00	22.6	8.2	0.9	94.2	9.2
22 Oct 90	12:36:00	24.2	8.3	0.6	92.7	9.2
22 Oct 90	12:37:00	23.5	8.3	0.5	92.6	9.2
22 Oct 90	12:38:00	27.5	8.4	0.5	90.2	9.1
22 Oct 90	12:39:00	28.5	8.5	0.5	89.1	9.1
22 Oct 90	12:40:00	31.5	8.5	0.6	88.3	9.0
22 Oct 90	12:41:00	30.7	8.5	0.7	87.4	9.0
22 Oct 90	12:42:00	32.2	8.5	0.7	88.1	9.0
22 Oct 90	12:43:00	31.2	8.5	0.7	88.3	9.0
22 Oct 90	12:44:00	27.5	8.5	0.6	89.0	9.0
22 Oct 90	12:45:00	28.6	8.5	0.5	89.0	9.0
22 Oct 90	12:46:00	27.0	8.5	0.2	90.2	9.1
22 Oct 90	12:47:00	26.0	8.4	-0.0	91.6	9.1
22 Oct 90	12:48:00	24.8	8.4	-0.1	92.2	9.1
22 Oct 90	12:49:00	27.9	8.4	-0.3	92.1	9.1
22 Oct 90	12:50:00	27.2	8.5	7.3	91.7	9.1
22 Oct 90	12:51:00	24.8	8.4	1.1	92.4	9.1
22 Oct 90	12:52:00	26.1	8.4	0.4	91.6	9.1
22 Oct 90	12:53:00	24.7	8.3	0.2	93.4	9.1
22 Oct 90	12:54:00	25.2	8.4	0.1	92.1	9.1
22 Oct 90	12:55:00	25.8	8.4	-0.0	91.5	9.1
22 Oct 90	12:56:00	26.2	8.3	-0.2	92.2	9.2
22 Oct 90	12:57:00	25.5	8.4	-0.3	92.3	9.1
22 Oct 90	12:58:00	24.8	8.3	-0.4	92.6	9.2
22 Oct 90	12:59:00	23.8	8.3	-0.4	94.0	9.2
22 Oct 90	13:00:00	25.0	8.3	-0.3	92.1	9.2
22 Oct 90	13:01:00	26.4	8.3	-0.3	92.5	9.2
22 Oct 90	13:02:00	22.7	8.3	-0.2	93.8	9.2
22 Oct 90	13:03:00	24.1	8.3	-0.1	92.4	9.1
22 Oct 90	13:04:00	25.7	8.5	-0.1	90.8	9.1
22 Oct 90	13:05:00	27.7	8.4	4.2	91.2	9.1
22 Oct 90	13:06:00	28.1	8.5	9.3	89.3	9.0
22 Oct 90	13:07:00	26.7	8.5	3.0	89.9	9.0
22 Oct 90	13:08:00	28.8	8.5	3.4	90.4	9.0
22 Oct 90	13:09:00	28.7	8.5	2.3	89.9	9.0
22 Oct 90	13:10:00	29.0	8.5	0.9	90.7	9.0
22 Oct 90	13:11:00	29.5	8.5	0.4	90.0	9.0
22 Oct 90	13:12:00	29.6	8.5	0.2	89.0	9.0
22 Oct 90	13:13:00	28.9	8.5	0.2	88.9	9.0
22 Oct 90	13:14:00	31.7	8.6	0.1	88.6	9.0
22 Oct 90	13:15:00	33.2	8.6	-0.1	87.5	9.0
22 Oct 90	13:16:00	30.6	8.5	-0.2	90.3	9.0
22 Oct 90	13:17:00	27.2	8.5	-0.4	89.3	9.0
22 Oct 90	13:18:00	30.0	8.5	-0.5	88.9	9.0
22 Oct 90	13:19:00	30.3	8.5	-0.5	89.2	9.0
22 Oct 90	13:20:00	29.7	8.5	-0.4	89.0	9.0
22 Oct 90	13:21:00	28.3	8.5	-0.4	90.7	9.1
22 Oct 90	13:22:00	30.1	8.5	-0.0	89.8	9.0
22 Oct 90	13:23:00	32.5	8.5	0.0	89.1	9.0
22 Oct 90	13:24:00	30.0	8.5	-0.3	91.1	9.1
22 Oct 90	13:25:00	28.3	8.5	-0.4	90.1	9.0
22 Oct 90	13:26:00	30.5	8.5	-0.6	91.0	9.0
22 Oct 90	13:27:00	31.1	8.4	-0.8	92.5	9.1
22 Oct 90	13:28:00	26.2	8.5	-1.0	91.1	9.0
22 Oct 90	13:29:00	30.0	8.5	-1.0	91.9	9.0
22 Oct 90	13:30:00	29.1	8.4	-1.1	92.6	9.0
22 Oct 90	13:31:00	29.2	8.5	-1.2	91.6	9.0
22 Oct 90	13:32:00	28.6	8.5	-1.2	91.9	9.0
22 Oct 90	13:33:00	33.7	8.5	-1.3	90.8	9.0
22 Oct 90	13:34:00	30.8	8.6	-1.3	88.7	8.9
22 Oct 90	13:35:00	35.8	8.7	13.7	87.7	8.9
22 Oct 90	13:36:00	37.1	8.7	14.4	87.1	8.9
22 Oct 90	13:37:00	34.7	8.7	0.6	87.0	8.9
22 Oct 90	13:38:00	36.9	8.8	-0.0	86.1	8.8
22 Oct 90	13:39:00	37.4	8.7	-0.5	85.9	8.9
22 Oct 90	13:40:00	36.9	8.8	-0.4	84.6	8.8
22 Oct 90	13:41:00	38.3	8.8	-0.5	84.8	8.8
22 Oct 90	13:42:00	34.9	8.7	-0.6	85.0	8.8
22 Oct 90	13:43:00	36.9	8.8	-0.6	85.4	8.8
22 Oct 90	13:44:00	37.8	8.8	-0.8	86.1	8.8
22 Oct 90	13:45:00	32.9	8.7	-0.8	86.3	8.8
22 Oct 90	13:46:00	32.1	8.6	3.1	87.9	8.9
22 Oct 90	13:47:00	35.9	8.7	0.3	85.9	8.8
22 Oct 90	13:48:00	74.6	9.2	0.6	79.5	8.5

22 Oct 90	13:49:00	78.7	9.0	-0.4	84.0	8.7
22 Oct 90	13:50:00	73.2	9.1	0.1	80.3	8.5
22 Oct 90	13:51:00	80.4	9.0	-0.6	83.2	8.6
22 Oct 90	13:52:00	68.7	9.1	1.6	81.8	8.6
22 Oct 90	13:53:00	84.3	9.1	0.3	81.7	8.6
22 Oct 90	13:54:00	77.9	9.1	0.0	81.4	8.6
22 Oct 90	13:55:00	85.7	9.1	-0.2	81.2	8.6
22 Oct 90	13:56:00	79.3	9.0	-0.6	82.9	8.6
22 Oct 90	13:57:00	70.8	9.0	-0.3	82.9	8.6
22 Oct 90	13:58:00	80.0	9.0	-0.6	83.3	8.7
22 Oct 90	13:59:00	76.0	8.9	-0.0	83.6	8.8
22 Oct 90	14:00:00	98.8	8.9	0.3	83.9	8.7
22 Oct 90	14:01:00	93.1	8.9	0.1	83.0	8.7
22 Oct 90	14:02:00	98.1	9.0	0.6	81.8	8.6
22 Oct 90	14:03:00	89.6	8.8	0.0	84.3	8.8
22 Oct 90	14:04:00	95.9	9.0	0.7	81.8	8.6
22 Oct 90	14:05:00	98.1	8.9	-0.1	83.9	8.7
22 Oct 90	14:06:00	88.3	8.8	0.2	84.6	8.8
22 Oct 90	14:07:00	83.5	8.8	-0.5	86.1	8.8
22 Oct 90	14:08:00	80.1	8.8	-0.2	85.0	8.8
22 Oct 90	14:09:00	87.6	8.8	-0.3	85.5	8.8
22 Oct 90	14:10:00	90.7	8.9	-0.1	84.6	8.7
22 Oct 90	14:11:00	88.4	8.8	-0.6	86.0	8.8
22 Oct 90	14:12:00	85.3	8.8	-0.3	85.5	8.8
22 Oct 90	14:13:00	90.2	8.9	-0.2	84.5	8.7
22 Oct 90	14:14:00	102.9	9.0	0.2	83.3	8.7
22 Oct 90	14:15:00	84.8	8.7	-0.5	86.2	8.8
22 Oct 90	14:16:00	94.0	8.9	-0.2	85.2	8.7
22 Oct 90	14:17:00	87.1	8.8	-0.2	85.6	8.8
22 Oct 90	14:18:00	81.8	8.7	-0.7	87.4	8.9
22 Oct 90	14:19:00	79.0	8.7	8.2	86.6	8.8
22 Oct 90	14:20:00	81.0	8.8	4.2	86.1	8.8
22 Oct 90	14:21:00	88.5	8.7	2.9	88.8	8.8
22 Oct 90	14:22:00	39.2	7.7	1.3	105.1	9.7
22 Oct 90	14:23:00	384.3	2.7	88.7	100.1	12.8
22 Oct 90	14:24:00	13.5	0.8	71.3	106.9	13.7
22 Oct 90	14:25:00	686.6	2.3	3.6	127.3	13.6
22 Oct 90	14:26:00	56.1	5.0	1.8	121.0	11.5
22 Oct 90	14:27:00	25.2	5.6	0.5	118.2	11.2
22 Oct 90	14:28:00	21.2	5.4	0.2	118.9	11.3
22 Oct 90	14:29:00	21.6	5.5	0.1	118.3	11.3
	AVERAGE	42.0	8.3	2.7	92.0	9.2
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	2.0	-0.5	0.0
	AVERAGE BIAS SPAN	251.5	6.0	26.1	244.0	4.9
	BIAS CORRECTED AVG	41.7	8.3	0.7	94.6	9.3

TITLE: TEST ONE - FUEL OIL
NOTE : SLURRY CEM DATA RUN 1A

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
22 Oct 90	14:30:00	21.1	5.4	-0.1	120.3	11.3
22 Oct 90	14:31:00	20.5	5.4	-0.1	119.6	11.3
22 Oct 90	14:32:00	21.5	5.6	-0.1	115.2	11.1
22 Oct 90	14:33:00	29.9	6.2	-0.2	107.8	10.7
22 Oct 90	14:34:00	30.8	6.2	-0.3	108.5	10.7
22 Oct 90	14:35:00	33.4	6.2	1.7	110.0	10.7
22 Oct 90	14:36:00	33.8	6.1	0.6	109.2	10.7
22 Oct 90	14:37:00	33.6	6.0	2.4	111.8	10.8
22 Oct 90	14:38:00	32.4	6.2	0.1	109.0	10.7
22 Oct 90	14:39:00	32.1	6.1	-0.3	109.2	10.7
22 Oct 90	14:40:00	32.1	6.2	-0.4	109.7	10.7
22 Oct 90	14:41:00	30.2	6.0	-0.3	110.8	10.8
22 Oct 90	14:42:00	34.7	6.2	-0.3	108.1	10.7
22 Oct 90	14:43:00	33.3	6.1	-0.1	110.1	10.8
22 Oct 90	14:44:00	32.6	6.0	-0.2	110.8	10.8
22 Oct 90	14:45:00	34.2	6.1	0.0	108.4	10.7
22 Oct 90	14:46:00	30.0	5.9	4.4	113.8	10.9
22 Oct 90	14:47:00	29.5	6.1	0.5	111.2	10.8
22 Oct 90	14:48:00	32.3	6.0	0.1	111.0	10.8
22 Oct 90	14:49:00	33.8	6.1	-0.2	110.9	10.8
22 Oct 90	14:50:00	33.6	6.0	-0.2	110.4	10.8
22 Oct 90	14:51:00	34.4	6.1	-0.4	109.5	10.7
22 Oct 90	14:52:00	32.4	6.2	-0.7	107.0	10.7
22 Oct 90	14:53:00	35.6	6.2	-0.6	107.0	10.7
22 Oct 90	14:54:00	33.7	6.2	-0.5	107.1	10.7
22 Oct 90	14:55:00	33.0	6.0	-0.6	107.1	10.8
22 Oct 90	14:56:00	34.3	6.2	-0.4	105.9	10.7
22 Oct 90	14:57:00	35.6	6.2	-0.1	106.5	10.7
22 Oct 90	14:58:00	33.0	6.1	-0.6	106.4	10.7
22 Oct 90	14:59:00	32.9	6.1	3.2	107.4	10.7
22 Oct 90	15:00:00	32.6	6.2	1.7	107.0	10.7
22 Oct 90	15:01:00	35.9	6.2	0.5	106.9	10.7
22 Oct 90	15:02:00	31.7	6.0	-0.1	109.6	10.8
22 Oct 90	15:03:00	31.2	6.1	-0.3	106.9	10.7
22 Oct 90	15:04:00	35.6	6.1	-0.6	108.2	10.7
22 Oct 90	15:05:00	33.2	6.1	-0.7	108.6	10.8
22 Oct 90	15:06:00	39.1	6.2	-0.8	106.5	10.6
22 Oct 90	15:07:00	35.1	6.1	-0.8	107.8	10.7
22 Oct 90	15:08:00	33.1	6.1	0.6	106.8	10.7
22 Oct 90	15:09:00	33.6	5.9	-0.5	110.6	10.9
22 Oct 90	15:10:00	34.9	6.2	-0.5	106.9	10.7
22 Oct 90	15:11:00	37.7	6.1	-0.8	108.4	10.7
22 Oct 90	15:32:00	46.4	6.5		101.5	10.5
22 Oct 90	15:33:00	47.6	6.5		101.1	10.5
22 Oct 90	15:34:00	47.6	6.5		101.6	10.6
22 Oct 90	15:35:00	48.5	6.5		101.4	10.5
22 Oct 90	15:36:00	52.2	6.5		100.7	10.5
22 Oct 90	15:37:00	49.2	6.4		101.7	10.6
22 Oct 90	15:38:00	44.5	6.3		101.2	10.6
22 Oct 90	15:39:00	44.2	6.3		102.5	10.7
22 Oct 90	15:40:00	42.2	6.3		102.2	10.6
22 Oct 90	15:41:00	47.7	6.4		101.8	10.6
22 Oct 90	15:54:00	42.8	6.3	5.0	109.4	10.6
22 Oct 90	15:55:00	47.8	6.5	5.0	108.0	10.5
22 Oct 90	15:56:00	44.1	6.4	4.9	108.2	10.5
22 Oct 90	15:57:00	43.7	6.4	4.9	109.5	10.6
22 Oct 90	15:58:00	42.5	6.4	5.0	109.3	10.6
22 Oct 90	15:59:00	43.7	6.5	4.8	108.9	10.5
22 Oct 90	16:00:00	46.3	6.5	4.7	108.3	10.5
22 Oct 90	16:01:00	43.4	6.3	4.3	111.7	10.6
22 Oct 90	16:02:00	41.8	6.5	4.5	108.7	10.5
22 Oct 90	16:03:00	44.9	6.3	4.4	109.9	10.6
22 Oct 90	16:04:00	40.6	6.3	4.7	109.3	10.6
22 Oct 90	16:05:00	46.3	6.5	5.9	108.0	10.4
22 Oct 90	16:06:00	37.7	6.2	5.9	111.6	10.6
22 Oct 90	16:07:00	43.2	6.4	5.1	109.9	10.6
22 Oct 90	16:08:00	45.2	6.3	4.7	109.2	10.6
22 Oct 90	16:09:00	44.7	6.4	6.2	110.3	10.5
22 Oct 90	16:10:00	45.5	6.3	7.4	113.1	10.6
22 Oct 90	16:11:00	37.9	6.3	4.9	111.7	10.6
22 Oct 90	16:12:00	43.5	6.4	4.6	109.7	10.5
22 Oct 90	16:13:00	47.4	6.4	4.4	109.9	10.5

22 Oct 90	16:14:00	40.5	6.3	4.3	109.3	10.6
22 Oct 90	16:15:00	46.7	6.5	4.4	107.0	10.5
22 Oct 90	16:16:00	41.3	6.4	4.5	106.4	10.5
22 Oct 90	16:17:00	45.5	6.4	4.5	106.3	10.5
22 Oct 90	16:18:00	48.2	6.5	4.6	106.5	10.5
22 Oct 90	16:19:00	49.0	6.5	4.4	107.5	10.5
22 Oct 90	16:20:00	44.5	6.4	4.1	108.0	10.5
22 Oct 90	16:21:00	44.9	6.4	3.9	108.6	10.5
22 Oct 90	16:22:00	42.0	6.4	3.8	108.7	10.5
22 Oct 90	16:23:00	44.1	6.4	3.7	108.4	10.5
22 Oct 90	16:24:00	43.4	6.3	4.0	109.4	10.6
22 Oct 90	16:25:00	43.9	6.5	8.5	107.8	10.5
22 Oct 90	16:26:00	45.4	6.4	6.2	107.7	10.5
22 Oct 90	16:27:00	43.7	6.4	4.9	109.6	10.5
22 Oct 90	16:28:00	40.4	6.3	4.4	108.7	10.5
22 Oct 90	16:29:00	43.6	6.5	4.2	108.4	10.5
22 Oct 90	16:30:00	40.4	6.3	3.7	111.2	10.5
22 Oct 90	16:31:00	40.8	6.4	3.7	108.2	10.5
22 Oct 90	16:32:00	45.2	6.4	3.5	110.5	10.5
22 Oct 90	16:33:00	40.9	6.3	3.1	111.2	10.6
22 Oct 90	16:34:00	37.9	6.4	3.1	109.9	10.5
22 Oct 90	16:35:00	40.4	6.4	3.1	110.6	10.5
22 Oct 90	16:36:00	42.1	6.4	3.4	110.2	10.5
22 Oct 90	16:37:00	39.8	6.2	3.3	111.3	10.6
22 Oct 90	16:38:00	46.7	6.4	3.4	109.0	10.5
22 Oct 90	16:39:00	38.1	6.2	14.9	111.2	10.6
22 Oct 90	16:40:00	43.3	6.4	13.0	108.6	10.5
22 Oct 90	16:41:00	44.1	6.4	8.5	107.1	10.5
22 Oct 90	16:42:00	41.2	6.6	6.1	105.0	10.4
22 Oct 90	16:43:00	44.2	6.4	4.6	108.8	10.5
22 Oct 90	16:44:00	40.2	6.3	4.0	108.9	10.6
22 Oct 90	16:45:00	44.1	6.5	3.7	105.2	10.4
22 Oct 90	16:46:00	41.3	6.5	3.4	106.5	10.4
22 Oct 90	16:47:00	42.6	6.4	3.3	107.1	10.5
22 Oct 90	16:48:00	44.4	6.4	3.5	107.2	10.5
22 Oct 90	16:49:00	42.0	6.5	3.4	107.6	10.4
22 Oct 90	16:50:00	44.9	6.4	3.6	106.9	10.5
22 Oct 90	16:51:00	44.5	6.3	3.4	107.8	10.5
22 Oct 90	16:52:00	40.4	6.3	3.3	108.9	10.5
22 Oct 90	16:53:00	41.9	6.3	3.1	109.4	10.5
22 Oct 90	16:54:00	41.3	6.4	3.0	109.0	10.5
22 Oct 90	16:55:00	43.2	6.4	7.2	110.0	10.5
22 Oct 90	16:56:00	40.7	6.4	9.4	109.5	10.5
22 Oct 90	16:57:00	46.2	6.4	5.9	109.3	10.5
22 Oct 90	16:58:00	39.5	6.4	4.2	108.8	10.5
22 Oct 90	16:59:00	41.6	6.3	3.9	110.6	10.6
22 Oct 90	17:00:00	42.1	6.4	3.7	107.5	10.5
22 Oct 90	17:01:00	43.1	6.4	3.4	108.1	10.5
22 Oct 90	17:02:00	37.4	6.2	3.2	111.7	10.6
22 Oct 90	17:03:00	39.1	6.4	3.1	108.8	10.5
22 Oct 90	17:04:00	41.9	6.4	3.1	109.4	10.5
22 Oct 90	17:05:00	39.8	6.3	2.9	108.7	10.5
22 Oct 90	17:06:00	40.8	6.3	2.8	109.2	10.5
22 Oct 90	17:07:00	43.4	6.3	2.8	109.2	10.5
22 Oct 90	17:08:00	44.3	6.4	2.8	107.8	10.5
22 Oct 90	17:09:00	43.9	6.5	2.6	107.0	10.4
22 Oct 90	17:10:00	43.6	6.4	3.3	106.6	10.5
22 Oct 90	17:11:00	43.2	6.4	2.7	105.8	10.4
22 Oct 90	17:12:00	39.7	6.4	16.1	105.9	10.4
22 Oct 90	17:13:00	40.4	6.4	8.9	105.9	10.4
22 Oct 90	17:14:00	41.4	6.4	4.9	104.8	10.4
22 Oct 90	17:15:00	44.8	6.4	4.0	104.2	10.4
22 Oct 90	17:16:00	45.2	6.4	3.4	105.8	10.5
22 Oct 90	17:17:00	41.6	6.4	3.1	106.3	10.5
22 Oct 90	17:18:00	44.2	6.5	3.0	104.8	10.4
22 Oct 90	17:19:00	46.1	6.5	2.8	104.9	10.4
22 Oct 90	17:20:00	41.8	6.3	2.6	107.4	10.5
22 Oct 90	17:21:00	41.4	6.4	2.9	104.7	10.5
22 Oct 90	17:22:00	43.2	6.4	2.9	104.3	10.4
22 Oct 90	17:23:00	40.7	6.3	5.4	106.9	10.5
22 Oct 90	17:24:00	37.9	6.3	4.5	105.8	10.5
22 Oct 90	17:25:00	46.5	6.5	3.3	105.5	10.4
22 Oct 90	17:26:00	43.6	6.4	2.8	108.1	10.5
22 Oct 90	17:27:00	41.9	6.5	2.9	106.3	10.4
22 Oct 90	17:28:00	45.6	6.5	2.5	107.4	10.4
22 Oct 90	17:29:00	39.6	6.3	2.5	108.6	10.5
22 Oct 90	17:30:00	42.3	6.5	2.5	108.4	10.4
22 Oct 90	17:31:00	38.0	6.4	13.5	106.8	10.5
22 Oct 90	17:32:00	44.3	6.5	10.2	103.8	10.4

22 Oct 90	17:33:00	40.3	6.3	5.0	105.7	10.5
22 Oct 90	17:34:00	44.9	6.5	4.3	103.3	10.4
22 Oct 90	17:47:00	40.8	6.5	2.2	105.2	10.4
22 Oct 90	17:48:00	38.7	6.3	2.2	107.2	10.5
22 Oct 90	17:49:00	42.0	6.5	2.4	104.9	10.4
22 Oct 90	17:50:00	41.3	6.4	2.3	106.8	10.5
22 Oct 90	17:51:00	39.3	6.4	2.3	105.5	10.5
22 Oct 90	17:52:00	42.9	6.5	2.3	105.3	10.5
22 Oct 90	17:53:00	39.9	6.4	2.2	106.9	10.5
22 Oct 90	17:54:00	38.5	6.4	2.2	106.7	10.5
22 Oct 90	17:55:00	41.7	6.5	2.4	105.6	10.5
22 Oct 90	17:56:00	41.5	6.4	2.1	107.3	10.5
22 Oct 90	17:57:00	36.9	6.3	2.2	107.5	10.6
22 Oct 90	17:58:00	43.7	6.5	2.5	102.1	10.4
22 Oct 90	17:59:00	44.0	6.4	2.5	104.7	10.5
22 Oct 90	18:00:00	44.5	6.6	6.4	101.4	10.4
	AVERAGE	40.3	6.3	3.3	107.9	10.6
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	1.9	0.0	0.0
	AVERAGE BIAS SPAN	251.5	5.9	26.4	249.0	4.9
	BIAS CORRECTED AVG	40.0	6.4	1.4	108.3	10.8

TITLE: TEST ONE - FUEL OIL
NOTE : ORSAT DATA RUN 1A OIL FOR PART TEST

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
22 Oct 90	16:01:00	43.4	6.3	4.3	111.7	10.6
22 Oct 90	16:02:00	41.8	6.5	4.5	108.7	10.5
22 Oct 90	16:03:00	44.9	6.3	4.4	109.9	10.6
22 Oct 90	16:04:00	40.6	6.3	4.7	109.3	10.6
22 Oct 90	16:05:00	46.3	6.5	5.9	108.0	10.4
22 Oct 90	16:06:00	37.7	6.2	5.9	111.6	10.6
22 Oct 90	16:07:00	43.2	6.4	5.1	109.9	10.6
22 Oct 90	16:08:00	45.2	6.3	4.7	109.2	10.6
22 Oct 90	16:09:00	44.7	6.4	6.2	110.3	10.5
22 Oct 90	16:10:00	45.5	6.3	7.4	113.1	10.6
22 Oct 90	16:11:00	37.9	6.3	4.9	111.7	10.6
22 Oct 90	16:12:00	43.5	6.4	4.6	109.7	10.5
22 Oct 90	16:13:00	47.4	6.4	4.4	109.9	10.5
22 Oct 90	16:14:00	40.5	6.3	4.3	109.3	10.6
22 Oct 90	16:15:00	46.7	6.5	4.4	107.0	10.5
22 Oct 90	16:16:00	41.3	6.4	4.5	106.4	10.5
22 Oct 90	16:17:00	45.5	6.4	4.5	106.3	10.5
22 Oct 90	16:18:00	48.2	6.5	4.6	106.5	10.5
22 Oct 90	16:19:00	49.0	6.5	4.4	107.5	10.5
22 Oct 90	16:20:00	44.5	6.4	4.1	108.0	10.5
22 Oct 90	16:21:00	44.9	6.4	3.9	108.6	10.5
22 Oct 90	16:22:00	42.0	6.4	3.8	108.7	10.5
22 Oct 90	16:23:00	44.1	6.4	3.7	108.4	10.5
22 Oct 90	16:24:00	43.4	6.3	4.0	109.4	10.6
22 Oct 90	16:25:00	43.9	6.5	8.5	107.8	10.5
22 Oct 90	16:26:00	45.4	6.4	6.2	107.7	10.5
22 Oct 90	16:27:00	43.7	6.4	4.9	109.6	10.5
22 Oct 90	16:28:00	40.4	6.3	4.4	108.7	10.5
22 Oct 90	16:29:00	43.6	6.5	4.2	108.4	10.5
22 Oct 90	16:30:00	40.4	6.3	3.7	111.2	10.5
22 Oct 90	16:31:00	40.8	6.4	3.7	108.2	10.5
22 Oct 90	16:49:00	42.0	6.5	3.4	107.6	10.4
22 Oct 90	16:50:00	44.9	6.4	3.6	106.9	10.5
22 Oct 90	16:51:00	44.5	6.3	3.4	107.8	10.5
22 Oct 90	16:52:00	40.4	6.3	3.3	108.9	10.5
22 Oct 90	16:53:00	41.9	6.3	3.1	109.4	10.5
22 Oct 90	16:54:00	41.3	6.4	3.0	109.0	10.5
22 Oct 90	16:55:00	43.2	6.4	7.2	110.0	10.5
22 Oct 90	16:56:00	40.7	6.4	9.4	109.5	10.5
22 Oct 90	16:57:00	46.2	6.4	5.9	109.3	10.5
22 Oct 90	16:58:00	39.5	6.4	4.2	108.8	10.5
22 Oct 90	16:59:00	41.6	6.3	3.9	110.6	10.6
22 Oct 90	17:00:00	42.1	6.4	3.7	107.5	10.5
22 Oct 90	17:01:00	43.1	6.4	3.4	108.1	10.5
22 Oct 90	17:02:00	37.4	6.2	3.2	111.7	10.6
22 Oct 90	17:03:00	39.1	6.4	3.1	108.8	10.5
22 Oct 90	17:04:00	41.9	6.4	3.1	109.4	10.5
22 Oct 90	17:05:00	39.8	6.3	2.9	108.7	10.5
22 Oct 90	17:06:00	40.8	6.3	2.8	109.2	10.5
22 Oct 90	17:07:00	43.4	6.3	2.8	109.2	10.5
22 Oct 90	17:08:00	44.3	6.4	2.8	107.8	10.5
22 Oct 90	17:09:00	43.9	6.5	2.6	107.0	10.4
22 Oct 90	17:10:00	43.6	6.4	3.3	106.6	10.5
22 Oct 90	17:11:00	43.2	6.4	2.7	105.8	10.4
22 Oct 90	17:12:00	39.7	6.4	16.1	105.9	10.4
22 Oct 90	17:13:00	40.4	6.4	8.9	105.9	10.4
22 Oct 90	17:14:00	41.4	6.4	4.9	104.8	10.4
22 Oct 90	17:15:00	44.8	6.4	4.0	104.2	10.4
22 Oct 90	17:16:00	45.2	6.4	3.4	105.8	10.5
22 Oct 90	17:17:00	41.6	6.4	3.1	106.3	10.5
22 Oct 90	17:18:00	44.2	6.5	3.0	104.8	10.4
22 Oct 90	17:19:00	46.1	6.5	2.8	104.9	10.4
22 Oct 90	17:20:00	41.8	6.3	2.6	107.4	10.5
	AVERAGE	42.9	6.4	4.5	108.4	10.5
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	1.9	0.0	0.0
	AVERAGE BIAS SPAN	251.5	5.9	26.4	249.0	4.9
	BIAS CORRECTED AVG	42.7	6.5	2.7	108.8	10.7

TEST T-1b

27 OCTOBER 1990

AVERAGE BIAS ZERO	1.0	0.0	1.2	0.1	0.0
AVERAGE BIAS SPAN	257.5	5.9	24.8	242.0	4.9
BIAS CORRECTED AVG	32.0	6.8	0.0	94.7	10.5

TITLE: RUN ONE B OIL
NOTE : ACETONE

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
28 Oct 90	01:48:00	65.2	9.3	SAMPLE	53.5	8.3
28 Oct 90	01:49:00	75.5	9.5	LINE	52.7	8.1
28 Oct 90	01:50:00	51.2	8.9	CONTAMINATED	57.1	8.6
28 Oct 90	01:51:00	46.4	9.2	FROM	54.9	8.4
28 Oct 90	01:52:00	83.2	9.5	FLAMEOUT	53.2	8.2
28 Oct 90	01:53:00	50.2	9.0		55.5	8.6
28 Oct 90	01:54:00	60.3	9.3		54.1	8.4
28 Oct 90	01:56:00	48.5	9.1		54.0	8.5
28 Oct 90	01:57:00	64.4	9.3		52.4	8.3
28 Oct 90	01:58:00	76.7	9.3		52.6	8.3
28 Oct 90	01:59:00	209.0	10.2		46.4	7.6
28 Oct 90	02:00:00	145.4	9.0		54.1	8.6
28 Oct 90	02:01:00	55.8	9.1		52.6	8.5
28 Oct 90	02:02:00	75.5	9.4		50.7	8.2
28 Oct 90	02:03:00	301.1	10.5		43.4	7.4
28 Oct 90	02:04:00	505.1	10.7		44.0	7.2
28 Oct 90	02:05:00	634.9	11.1		42.5	7.0
28 Oct 90	02:06:00	656.1	11.2		41.0	6.9
28 Oct 90	02:07:00	712.3	11.2		41.5	6.9
28 Oct 90	02:08:00	940.5	11.5		38.2	6.6
FLAMEOUT						
28 Oct 90	02:15:00	38.0	6.3		83.6	10.5
28 Oct 90	02:16:00	40.2	7.8		76.5	9.5
28 Oct 90	02:17:00	53.7	8.2		73.9	9.2
28 Oct 90	02:18:00	50.8	8.4		72.1	9.0
28 Oct 90	02:19:00	34.1	8.9		67.4	8.6
28 Oct 90	02:20:00	37.2	9.5		65.4	8.2
28 Oct 90	02:21:00	45.1	9.6		64.1	8.1
28 Oct 90	02:22:00	325.8	5.1		74.3	11.7
28 Oct 90	02:23:00	470.8	0.9		78.2	14.1
28 Oct 90	02:24:00	623.1	0.8		77.9	12.9
28 Oct 90	02:25:00	OFF	-0.1		119.5	12.3
28 Oct 90	02:26:00	SCALE	0.3		177.9	13.8
28 Oct 90	02:27:00	413.9	1.7		213.6	13.9
28 Oct 90	02:28:00	81.3	1.7		211.6	14.0
28 Oct 90	02:29:00	74.9	1.7		211.0	13.9
28 Oct 90	02:30:00	86.6	1.7		204.9	14.0
28 Oct 90	02:31:00	106.2	1.9		204.9	13.8
28 Oct 90	02:32:00	93.4	1.8		207.6	13.9
28 Oct 90	02:33:00	104.9	1.8		206.8	13.9
28 Oct 90	02:34:00	77.8	1.8		206.3	13.9
28 Oct 90	02:35:00	457.7	4.0		171.7	12.1
28 Oct 90	02:36:00	25.0	6.0		151.0	10.7
28 Oct 90	02:37:00	10.6	6.1		158.5	10.6
28 Oct 90	02:38:00	9.5	6.1		152.0	10.7
28 Oct 90	02:39:00	9.3	6.2		143.9	10.6
28 Oct 90	02:40:00	17.1	4.1		160.4	12.3
28 Oct 90	02:41:00	50.4	1.9		179.6	13.8
28 Oct 90	02:42:00	41.8	2.2		179.5	13.5
28 Oct 90	02:43:00	17.5	6.0		149.0	10.7
28 Oct 90	02:44:00	6.9	5.6		163.2	11.0
28 Oct 90	02:45:00	6.4	5.7		160.7	10.9
28 Oct 90	02:46:00	6.5	5.6		161.6	10.9
28 Oct 90	02:47:00	6.0	5.6		155.4	11.0
28 Oct 90	02:48:00	6.0	5.7		160.0	10.9
28 Oct 90	02:49:00	6.0	5.7		157.7	10.9
28 Oct 90	02:50:00	12.8	6.7		127.9	9.6
FLAMEOUT						
28 Oct 90	02:59:00	301.3	2.3		182.6	13.6
28 Oct 90	03:00:00	31.8	3.4		184.0	12.7
28 Oct 90	03:01:00	17.9	4.0		186.3	12.3
28 Oct 90	03:02:00	15.6	4.6		179.6	11.8
28 Oct 90	03:03:00	14.8	4.4		177.0	12.0
28 Oct 90	03:04:00	14.0	4.6		183.7	11.8
28 Oct 90	03:05:00	14.0	4.5		185.7	11.9
28 Oct 90	03:06:00	13.4	4.4		185.0	12.0
28 Oct 90	03:07:00	13.2	4.5		184.5	11.9
28 Oct 90	03:08:00	13.7	4.5		173.2	11.9
28 Oct 90	03:09:00	12.2	4.9		169.7	11.5
28 Oct 90	03:10:00	10.5	5.5		168.5	11.0
28 Oct 90	03:11:00	9.9	5.3		170.7	11.2
28 Oct 90	03:12:00	9.9	5.4		172.2	11.1

28 Oct 90	03:13:00	9.9	5.3	173.2	11.2
28 Oct 90	03:14:00	9.3	5.3	165.4	11.2
28 Oct 90	03:15:00	8.9	5.4	166.8	11.1
28 Oct 90	03:16:00	8.9	5.4	172.5	11.1
28 Oct 90	03:17:00	8.9	5.3	174.1	11.2
28 Oct 90	03:18:00	8.5	5.3	168.0	11.2
28 Oct 90	03:19:00	8.5	5.7	157.7	10.9
28 Oct 90	03:20:00	311.3	2.9	169.8	13.2
28 Oct 90	03:21:00	972.8	1.0	178.9	14.3
28 Oct 90	03:22:00	974.1	1.0	178.6	14.3
28 Oct 90	03:23:00	974.1	1.0	179.0	14.3
28 Oct 90	03:24:00	974.1	1.0	177.1	14.3
28 Oct 90	03:25:00	974.2	1.0	177.7	14.3
28 Oct 90	03:26:00	974.0	1.0	177.1	14.3
28 Oct 90	03:27:00	974.2	1.0	176.9	14.3
28 Oct 90	03:28:00	974.1	1.0	177.7	14.3
28 Oct 90	03:29:00	974.1	0.9	180.1	14.3
28 Oct 90	03:30:00	974.1	1.0	177.2	14.3
28 Oct 90	03:31:00	910.2	0.3	176.2	13.9
28 Oct 90	03:32:00	473.5	-0.0	138.4	12.6
28 Oct 90	03:33:00	0.8	-0.1	91.3	10.4
28 Oct 90	03:34:00	1.0	-0.1	117.2	11.6
28 Oct 90	03:35:00	1.0	-0.0	155.9	13.1
28 Oct 90	03:36:00	134.3	-0.0	132.2	12.3
28 Oct 90	03:37:00	34.7	3.5	130.5	11.7
28 Oct 90	03:38:00	293.9	8.9	92.7	8.4
28 Oct 90	03:39:00	93.9	9.6	83.9	7.9
	AVERAGE	215.0	5.1	133.7	11.1
	SPAN GAS VALUE	255.0	6.0	250.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	0.1	0.0
	AVERAGE BIAS SPAN	258.5	5.9	242.0	4.9
	BIAS CORRECTED AVG	211.9	5.2	138.1	11.4

TITLE: RUN ONE B OIL
NOTE : START PART TEST 1B AT 2218

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
27 Oct 90	22:19:00	15.1	7.7	0.8	75.1	9.6
27 Oct 90	22:20:00	14.6	7.6	0.8	75.7	9.6
27 Oct 90	22:21:00	18.5	8.5	0.8	71.6	9.0
27 Oct 90	22:22:00	15.5	8.2	0.8	72.3	9.2
27 Oct 90	22:50:00	28.9	8.6	1.2	60.3	8.9
27 Oct 90	22:51:00	37.3	9.1	1.2	58.3	8.5
27 Oct 90	22:52:00	50.2	9.0	1.2	58.7	8.6
27 Oct 90	22:53:00	42.6	9.0	1.3	57.5	8.5
27 Oct 90	22:54:00	73.2	9.5	1.4	54.8	8.2
27 Oct 90	22:55:00	97.5	9.8	1.5	53.4	7.9
27 Oct 90	22:56:00	76.9	9.3	1.1	56.6	8.3
27 Oct 90	22:57:00	88.7	9.6	1.3	54.4	8.1
27 Oct 90	22:58:00	49.0	8.7	0.9	61.2	8.9
27 Oct 90	22:59:00	30.4	8.6	0.9	60.1	8.9
27 Oct 90	23:00:00	34.9	8.7	1.0	59.9	8.8
27 Oct 90	23:01:00	32.9	8.1	0.9	62.5	9.3
27 Oct 90	23:02:00	25.9	8.3	0.9	61.6	9.1
27 Oct 90	23:03:00	26.6	8.1	0.9	63.2	9.3
27 Oct 90	23:04:00	28.6	8.3	0.9	60.4	9.1
27 Oct 90	23:05:00	33.7	8.4	0.8	60.7	9.0
27 Oct 90	23:06:00	28.4	8.4	0.8	61.6	9.0
27 Oct 90	23:07:00	32.6	8.6	0.8	59.8	8.9
27 Oct 90	23:08:00	30.7	8.6	0.8	60.2	8.9
27 Oct 90	23:09:00	41.9	8.9	0.9	58.2	8.7
27 Oct 90	23:10:00	32.6	8.5	0.8	60.6	9.0
27 Oct 90	23:11:00	36.4	8.8	0.8	59.3	8.7
27 Oct 90	23:12:00	43.1	9.0	0.9	57.1	8.5
27 Oct 90	23:13:00	51.5	8.9	1.8	59.0	8.7
27 Oct 90	23:14:00	49.6	9.2	1.1	56.5	8.4
27 Oct 90	23:15:00	53.3	9.1	1.0	56.5	8.5
27 Oct 90	23:16:00	87.6	9.6	1.0	53.4	8.1
27 Oct 90	23:17:00	68.4	9.3	0.9	55.2	8.3
27 Oct 90	23:18:00	89.0	9.6	1.0	53.9	8.1
27 Oct 90	23:19:00	73.1	9.3	0.9	54.3	8.3
27 Oct 90	23:20:00	111.6	9.7	1.2	53.6	8.0
27 Oct 90	23:21:00	84.8	9.7	1.3	52.6	8.0
27 Oct 90	23:22:00	130.8	9.7	1.0	52.7	8.0
27 Oct 90	23:23:00	158.2	10.1	2.7	49.0	7.7
27 Oct 90	23:24:00	209.1	10.0	1.8	50.5	7.8
27 Oct 90	23:25:00	136.0	10.0	2.1	49.9	7.8
27 Oct 90	23:26:00	228.4	10.1	1.9	49.4	7.7
27 Oct 90	23:27:00	108.3	9.2	0.7	55.3	8.4
27 Oct 90	23:28:00	70.2	9.5	0.8	54.5	8.2
27 Oct 90	23:29:00	67.1	8.8	0.6	58.5	8.7
27 Oct 90	23:30:00	57.1	9.0	0.6	58.0	8.6
27 Oct 90	23:31:00	33.4	8.6	0.6	58.8	8.9
27 Oct 90	23:32:00	46.1	8.8	0.6	58.0	8.7
27 Oct 90	23:33:00	34.7	8.5	0.6	59.7	8.9
27 Oct 90	23:34:00	60.5	9.3	0.8	54.9	8.3
27 Oct 90	23:35:00	68.7	9.0	0.6	56.8	8.6
27 Oct 90	23:36:00	41.3	8.9	0.8	57.2	8.6
27 Oct 90	23:37:00	83.6	9.2	0.8	56.2	8.4
27 Oct 90	23:38:00	68.2	9.3	0.7	54.4	8.3
27 Oct 90	23:39:00	129.1	9.8	1.7	50.9	7.9
27 Oct 90	23:40:00	101.6	9.3	0.7	55.3	8.4
27 Oct 90	23:41:00	69.1	9.4	0.9	53.5	8.2
27 Oct 90	23:42:00	109.3	9.7	0.8	52.8	8.0
28 Oct 90	01:10:00	57.4	9.4	17.8	53.2	8.3
28 Oct 90	01:11:00	124.9	9.9	16.3	51.4	8.0
28 Oct 90	01:12:00	85.8	9.1	14.8	57.3	8.6
28 Oct 90	01:13:00	38.9	9.1	14.0	54.8	8.5
28 Oct 90	01:14:00	67.4	9.2	13.2	55.4	8.5
28 Oct 90	01:15:00	60.8	9.4	12.5	53.4	8.3
28 Oct 90	01:16:00	59.3	9.2	11.7	54.4	8.4
28 Oct 90	01:17:00	90.8	9.6	11.3	52.7	8.1
28 Oct 90	01:18:00	63.5	9.4	10.5	53.1	8.3
28 Oct 90	01:19:00	82.6	9.4	9.7	54.7	8.3
28 Oct 90	01:20:00	52.8	9.2	9.3	54.1	8.4
28 Oct 90	01:21:00	65.1	9.1	9.1	56.1	8.5
28 Oct 90	01:22:00	45.5	9.1	8.7	55.1	8.5
28 Oct 90	01:23:00	41.3	8.9	8.4	56.5	8.6
28 Oct 90	01:24:00	51.6	9.2	8.2	55.2	8.4

28 Oct 90	01:25:00	41.7	9.0	7.8	56.3	8.6
28 Oct 90	01:26:00	39.2	8.8	7.4	57.8	8.8
28 Oct 90	01:27:00	42.7	9.0	7.1	55.9	8.6
28 Oct 90	01:28:00	39.7	8.9	6.8	56.1	8.6
28 Oct 90	01:29:00	54.4	9.2	6.5	55.7	8.5
28 Oct 90	01:30:00	45.0	9.2	6.3	54.6	8.4
28 Oct 90	01:31:00	61.4	9.2	6.1	55.1	8.5
28 Oct 90	01:32:00	55.1	9.4	6.0	53.1	8.3
28 Oct 90	01:33:00	86.2	9.5	5.5	53.4	8.2
28 Oct 90	01:34:00	97.3	9.9	7.1	49.5	7.9
	AVERAGE	64.6	9.1	3.7	56.9	8.5
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	1.8	0.1	0.0
	AVERAGE BIAS SPAN	258.5	5.9	25.6	242.0	4.9
	BIAS CORRECTED AVG	63.0	9.3	2.0	58.7	8.7

TITLE: RUN ONE B OIL
NOTE : OIL

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
27 Oct 90	14:32:00	45.2	8.1	10.5	95.0	9.4
27 Oct 90	14:33:00	42.8	8.0	9.8	95.9	9.5
27 Oct 90	14:34:00	45.3	8.0	9.1	95.3	9.5
27 Oct 90	14:35:00	37.6	7.9	8.4	95.0	9.5
27 Oct 90	14:36:00	37.4	8.0	7.9	95.1	9.5
27 Oct 90	14:37:00	40.4	7.9	7.4	96.4	9.5
27 Oct 90	14:38:00	41.7	8.0	7.0	96.6	9.4
27 Oct 90	14:39:00	42.3	7.9	6.4	97.6	9.5
27 Oct 90	14:40:00	38.3	7.9	5.9	96.5	9.5
27 Oct 90	14:41:00	37.7	7.9	5.7	97.8	9.5
27 Oct 90	14:42:00	42.6	7.9	5.6	96.1	9.5
27 Oct 90	14:43:00	40.7	7.9	5.4	95.8	9.5
27 Oct 90	14:44:00	41.8	7.9	5.2	96.7	9.5
27 Oct 90	14:45:00	38.4	7.8	5.0	96.8	9.5
27 Oct 90	14:46:00	37.4	7.8	4.8	97.3	9.5
27 Oct 90	14:47:00	37.9	7.9	4.5	98.0	9.5
27 Oct 90	14:48:00	34.8	7.8	4.3	98.8	9.6
27 Oct 90	14:49:00	32.7	7.8	4.1	98.9	9.5
27 Oct 90	14:50:00	34.7	7.8	4.0	98.3	9.5
27 Oct 90	14:51:00	37.8	7.9	4.0	98.0	9.4
27 Oct 90	14:52:00	41.1	8.0	3.9	96.3	9.4
27 Oct 90	14:53:00	38.6	8.0	3.9	95.4	9.4
27 Oct 90	14:54:00	40.9	8.1	3.9	95.5	9.3
27 Oct 90	14:55:00	42.5	8.0	3.8	95.7	9.3
27 Oct 90	14:56:00	38.3	8.1	3.8	95.8	9.3
27 Oct 90	14:57:00	41.5	8.1	3.8	96.0	9.3
27 Oct 90	14:58:00	43.3	8.1	3.9	96.3	9.3
27 Oct 90	14:59:00	43.8	8.1	3.8	95.6	9.3
27 Oct 90	15:00:00	40.5	8.0	3.6	96.0	9.3
27 Oct 90	15:01:00	40.9	8.0	3.6	95.8	9.4
27 Oct 90	15:02:00	37.8	8.0	3.4	96.4	9.4
27 Oct 90	15:03:00	39.2	8.0	3.2	96.4	9.4
27 Oct 90	15:04:00	41.2	8.0	3.1	96.5	9.4
27 Oct 90	15:05:00	43.6	8.0	2.8	97.5	9.4
27 Oct 90	15:06:00	39.6	8.0	2.7	96.9	9.4
27 Oct 90	15:07:00	40.2	7.9	2.6	97.5	9.4
27 Oct 90	15:08:00	38.2	7.9	2.5	97.9	9.4
27 Oct 90	15:09:00	37.2	7.9	2.4	96.7	9.4
27 Oct 90	15:10:00	34.5	7.9	2.3	98.2	9.4
27 Oct 90	15:11:00	31.0	7.8	2.2	98.5	9.5
27 Oct 90	15:12:00	33.7	7.9	2.2	98.4	9.4
27 Oct 90	15:13:00	36.4	7.8	2.1	98.8	9.5
27 Oct 90	15:14:00	31.8	7.9	2.1	98.3	9.5
27 Oct 90	15:15:00	36.3	7.8	2.2	99.7	9.5
27 Oct 90	15:16:00	37.5	7.9	3.6	98.8	9.5
27 Oct 90	15:17:00	35.8	7.9	2.4	98.7	9.4
27 Oct 90	15:18:00	34.5	7.9	2.3	99.7	9.4
27 Oct 90	15:19:00	38.8	8.0	2.1	98.7	9.4
27 Oct 90	15:20:00	37.2	8.0	1.9	99.2	9.4
	AVERAGE	38.8	7.9	4.3	97.1	9.4
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	0.4	0.0	0.0
	AVERAGE BIAS SPAN	256.0	5.9	24.8	248.0	5.0
	BIAS CORRECTED AVG	37.8	8.1	4.0	97.9	9.4

TITLE: RUN ONE B OIL
NOTE : SLURRY

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
27 Oct 90	15:45:00	7.5	4.7	1.4	122.6	11.8
27 Oct 90	15:46:00	7.4	4.2	1.4	125.1	12.2
27 Oct 90	15:47:00	10.3	4.4	1.4	121.0	11.9
27 Oct 90	15:48:00	7.3	4.9	1.4	120.3	11.6
27 Oct 90	15:49:00	7.5	4.7	1.4	121.4	11.8
27 Oct 90	15:50:00	7.6	4.5	1.4	121.2	11.9
27 Oct 90	15:51:00	8.2	4.5	1.4	121.9	11.9
27 Oct 90	15:52:00	8.0	4.4	1.4	122.1	12.0
27 Oct 90	15:53:00	8.0	4.3	1.4	123.4	12.1
27 Oct 90	15:54:00	7.6	4.6	1.4	121.9	11.8
27 Oct 90	15:55:00	7.1	4.7	1.4	121.2	11.8
27 Oct 90	15:56:00	7.5	4.6	1.4	121.7	11.9
27 Oct 90	15:57:00	7.7	4.7	1.3	122.4	11.8
27 Oct 90	15:58:00	8.1	4.7	1.3	121.4	11.8
27 Oct 90	15:59:00	9.0	4.5	1.3	123.8	11.9
27 Oct 90	16:00:00	8.0	4.5	1.2	124.1	11.9
27 Oct 90	16:01:00	8.3	4.5	1.3	120.6	11.9
27 Oct 90	16:02:00	7.8	4.8	1.3	121.3	11.6
27 Oct 90	16:03:00	7.4	4.9	1.3	120.9	11.6
27 Oct 90	16:04:00	7.7	4.8	1.3	121.7	11.7
27 Oct 90	16:05:00	8.0	4.7	1.3	121.9	11.7
27 Oct 90	16:06:00	8.2	4.7	1.2	121.6	11.8
27 Oct 90	16:07:00	8.0	4.8	1.6	122.5	11.7
27 Oct 90	16:08:00	8.5	4.7	1.3	120.4	11.8
27 Oct 90	16:09:00	10.2	4.2	1.3	123.7	12.1
27 Oct 90	16:10:00	9.6	4.5	1.3	121.5	11.9
27 Oct 90	16:11:00	8.5	4.7	1.4	121.5	11.8
27 Oct 90	16:12:00	9.9	4.6	1.2	122.3	11.9
27 Oct 90	16:13:00	9.0	4.5	1.2	123.1	12.0
27 Oct 90	16:14:00	10.1	4.3	1.2	122.9	12.1
27 Oct 90	16:15:00	9.0	4.4	1.4	122.9	12.0
27 Oct 90	16:16:00	8.5	4.6	1.3	123.9	11.9
27 Oct 90	16:17:00	8.3	4.4	1.5	125.0	12.0
27 Oct 90	16:18:00	8.1	4.3	1.3	125.9	12.1
27 Oct 90	16:19:00	7.3	4.3	1.2	124.9	12.1
27 Oct 90	16:20:00	7.4	4.3	1.2	125.8	12.1
27 Oct 90	16:21:00	7.1	4.3	1.1	125.5	12.0
27 Oct 90	16:22:00	7.5	4.3	1.3	125.1	12.1
27 Oct 90	16:23:00	6.8	4.3	1.2	125.4	12.0
27 Oct 90	16:24:00	7.0	4.2	1.3	124.7	12.1
27 Oct 90	16:25:00	7.8	4.3	1.2	125.6	12.0
27 Oct 90	16:26:00	7.3	4.4	1.3	125.0	12.0
27 Oct 90	16:27:00	7.2	4.4	1.3	124.4	12.0
27 Oct 90	16:28:00	6.9	4.6	1.3	123.4	11.8
27 Oct 90	16:29:00	7.8	4.2	1.2	125.1	12.1
27 Oct 90	16:30:00	7.8	4.1	1.2	127.5	12.3
27 Oct 90	16:31:00	7.4	4.2	1.3	125.2	12.1
27 Oct 90	16:32:00	7.4	4.4	1.1	125.1	12.0
27 Oct 90	16:33:00	7.1	4.4	1.1	126.0	12.0
27 Oct 90	16:34:00	8.0	4.3	1.1	124.9	12.1
27 Oct 90	16:35:00	7.9	4.2	1.3	126.1	12.1
27 Oct 90	16:36:00	7.8	4.1	1.1	127.3	12.2
27 Oct 90	16:37:00	8.0	4.4	1.1	125.9	12.0
27 Oct 90	16:38:00	7.3	4.4	1.2	125.5	12.0
27 Oct 90	16:39:00	8.1	4.4	1.2	124.6	12.0
27 Oct 90	16:40:00	8.6	4.3	3.3	126.0	12.1
27 Oct 90	16:41:00	8.0	4.3	1.4	125.9	12.1
27 Oct 90	16:42:00	8.5	4.3	1.3	128.1	12.1
27 Oct 90	16:43:00	7.7	4.3	1.2	125.1	12.0
27 Oct 90	16:44:00	6.4	4.5	1.2	126.5	11.9
27 Oct 90	16:45:00	6.0	4.5	1.1	127.8	11.9
27 Oct 90	16:46:00	6.5	4.3	1.1	128.2	12.0
27 Oct 90	16:47:00	6.9	4.2	1.2	127.4	12.2
27 Oct 90	16:48:00	7.1	4.1	1.2	130.1	12.2
27 Oct 90	16:49:00	7.1	4.0	1.1	128.8	12.3
27 Oct 90	16:50:00	7.5	4.1	1.1	129.2	12.2
27 Oct 90	16:51:00	7.2	4.0	1.1	130.0	12.3
27 Oct 90	16:52:00	7.4	4.1	1.1	127.3	12.2
27 Oct 90	16:53:00	7.1	4.1	1.1	128.6	12.2
27 Oct 90	16:54:00	7.1	4.1	1.1	128.6	12.2
27 Oct 90	16:55:00	7.1	4.3	1.3	126.5	12.1
27 Oct 90	16:56:00	6.5	4.4	1.2	125.7	12.0

27 Oct 90	16:57:00	7.0	4.2	1.1	128.0	12.2
27 Oct 90	16:58:00	7.1	4.1	1.1	127.3	12.2
27 Oct 90	16:59:00	7.2	4.1	1.1	127.0	12.2
27 Oct 90	17:00:00	7.7	4.2	1.1	127.1	12.2
27 Oct 90	17:01:00	7.4	4.4	1.1	125.1	12.0
27 Oct 90	17:02:00	8.4	4.3	1.1	124.2	12.1
27 Oct 90	17:03:00	7.6	4.1	1.1	125.0	12.2
27 Oct 90	17:04:00	8.1	4.1	1.1	126.7	12.2
27 Oct 90	17:05:00	7.7	4.1	1.1	127.4	12.2
27 Oct 90	17:06:00	7.2	4.1	3.5	126.1	12.2
27 Oct 90	17:07:00	8.3	4.4	1.5	124.8	12.0
27 Oct 90	17:08:00	7.3	4.5	1.4	125.6	11.9
27 Oct 90	17:09:00	7.7	4.3	1.3	125.1	12.1
27 Oct 90	17:10:00	7.4	4.3	1.3	126.0	12.0
27 Oct 90	17:11:00	7.2	4.2	1.2	127.2	12.1
27 Oct 90	17:12:00	7.0	4.2	1.2	127.8	12.1
27 Oct 90	17:13:00	7.3	4.3	1.1	126.0	12.1
27 Oct 90	17:14:00	6.4	4.4	1.3	126.4	12.0
27 Oct 90	17:15:00	6.0	4.3	1.1	125.4	12.1
27 Oct 90	17:16:00	6.1	4.2	1.0	125.2	12.1
27 Oct 90	17:17:00	6.9	4.2	1.1	126.1	12.1
27 Oct 90	17:18:00	6.7	4.1	1.1	126.2	12.2
27 Oct 90	17:19:00	7.1	4.1	1.1	126.2	12.2
27 Oct 90	17:20:00	6.4	4.2	1.0	126.9	12.1
27 Oct 90	17:21:00	6.9	4.1	1.0	127.6	12.2
27 Oct 90	17:22:00	6.5	4.1	1.0	126.2	12.2
27 Oct 90	17:23:00	7.2	4.1	1.0	126.0	12.2
27 Oct 90	17:24:00	7.1	4.1	1.0	125.4	12.2
27 Oct 90	17:25:00	7.3	4.1	1.0	127.1	12.2
27 Oct 90	17:26:00	6.8	4.1	1.1	126.3	12.2
27 Oct 90	17:27:00	7.3	4.0	1.0	128.2	12.3
27 Oct 90	17:28:00	7.1	4.1	1.0	126.9	12.2
27 Oct 90	17:29:00	7.5	4.1	1.0	127.3	12.3
27 Oct 90	17:30:00	7.2	4.4	1.0	124.1	12.0
BURNER CONTROLL PROBLEMS						
27 Oct 90	21:40:00	20.4	6.7	1.8	83.5	10.2
27 Oct 90	21:41:00	10.9	7.0	1.5	81.5	10.0
27 Oct 90	21:42:00	12.6	7.3	1.4	81.1	9.9
27 Oct 90	21:43:00	11.9	7.0	1.9	80.4	10.0
27 Oct 90	21:44:00	11.6	7.3	1.8	80.7	9.8
27 Oct 90	21:45:00	12.4	7.4	1.5	78.9	9.7
27 Oct 90	21:46:00	14.6	7.6	1.3	77.9	9.6
27 Oct 90	21:47:00	15.8	7.6	1.3	77.2	9.6
27 Oct 90	21:48:00	16.3	7.9	1.1	76.1	9.4
27 Oct 90	21:49:00	16.8	8.0	1.1	75.5	9.3
27 Oct 90	21:50:00	19.1	8.3	1.0	72.4	9.0
27 Oct 90	21:51:00	22.7	8.3	1.1	72.5	9.1
27 Oct 90	21:52:00	21.6	8.3	1.0	71.9	9.1
27 Oct 90	21:53:00	21.8	8.6	1.0	70.3	8.9
27 Oct 90	21:54:00	28.4	8.8	0.9	69.1	8.7
27 Oct 90	21:55:00	33.0	8.8	0.9	69.1	8.7
27 Oct 90	21:56:00	29.2	8.6	0.9	69.8	8.8
27 Oct 90	21:57:00	26.1	8.8	0.8	68.7	8.7
27 Oct 90	21:58:00	29.3	9.2	1.1	59.8	8.0
27 Oct 90	21:59:00	13.4	14.3	-0.7	39.8	4.5
27 Oct 90	22:00:00	16.2	7.7	-0.7	76.3	9.5
27 Oct 90	22:01:00	13.6	7.2	-0.7	78.5	9.9
27 Oct 90	22:02:00	11.1	6.7	0.8	80.1	10.2
27 Oct 90	22:03:00	12.2	6.5	1.8	80.7	10.4
27 Oct 90	22:04:00	10.0	6.1	1.4	82.8	10.7
27 Oct 90	22:05:00	10.4	6.3	1.3	81.2	10.5
27 Oct 90	22:06:00	8.3	5.8	1.2	85.2	10.9
27 Oct 90	22:07:00	7.9	5.8	1.2	84.3	10.9
27 Oct 90	22:08:00	9.1	6.2	1.2	83.2	10.6
27 Oct 90	22:09:00	9.5	6.3	1.2	80.6	10.5
27 Oct 90	22:10:00	8.0	6.2	1.2	83.3	10.6
BIAS CHECK						
27 Oct 90	22:19:00	15.1	7.7	0.8	75.1	9.6
27 Oct 90	22:20:00	14.6	7.6	0.8	75.7	9.6
27 Oct 90	22:21:00	18.5	8.5	0.8	71.6	9.0
27 Oct 90	22:22:00	15.5	8.2	0.8	72.3	9.2
FLAMEOUT						
27 Oct 90	22:50:00	28.9	8.6	1.2	60.3	8.9
27 Oct 90	22:51:00	37.3	9.1	1.2	58.3	8.5
27 Oct 90	22:52:00	50.2	9.0	1.2	58.7	8.6
27 Oct 90	22:53:00	42.6	9.0	1.3	57.5	8.5
27 Oct 90	22:54:00	73.2	9.5	1.4	54.8	8.2
27 Oct 90	22:55:00	97.5	9.8	1.5	53.4	7.9
27 Oct 90	22:56:00	76.9	9.3	1.1	56.6	8.3

27 Oct 90	22:57:00	88.7	9.6	1.3	54.4	8.1
27 Oct 90	22:58:00	49.0	8.7	0.9	61.2	8.9
27 Oct 90	22:59:00	30.4	8.6	0.9	60.1	8.9
27 Oct 90	23:00:00	34.9	8.7	1.0	59.9	8.8
27 Oct 90	23:01:00	32.9	8.1	0.9	62.5	9.3
27 Oct 90	23:02:00	25.9	8.3	0.9	61.6	9.1
27 Oct 90	23:03:00	26.6	8.1	0.9	63.2	9.3
27 Oct 90	23:04:00	28.6	8.3	0.9	60.4	9.1
27 Oct 90	23:05:00	33.7	8.4	0.8	60.7	9.0
27 Oct 90	23:06:00	28.4	8.4	0.8	61.6	9.0
27 Oct 90	23:07:00	32.6	8.6	0.8	59.8	8.9
27 Oct 90	23:08:00	30.7	8.6	0.8	60.2	8.9
27 Oct 90	23:09:00	41.9	8.9	0.9	58.2	8.7
27 Oct 90	23:10:00	32.6	8.5	0.8	60.6	9.0
27 Oct 90	23:11:00	36.4	8.8	0.8	59.3	8.7
27 Oct 90	23:12:00	43.1	9.0	0.9	57.1	8.5
27 Oct 90	23:13:00	51.5	8.9	1.8	59.0	8.7
27 Oct 90	23:14:00	49.6	9.2	1.1	56.5	8.4
27 Oct 90	23:15:00	53.3	9.1	1.0	56.5	8.5
27 Oct 90	23:16:00	87.6	9.6	1.0	53.4	8.1
27 Oct 90	23:17:00	68.4	9.3	0.9	55.2	8.3
27 Oct 90	23:18:00	89.0	9.6	1.0	53.9	8.1
27 Oct 90	23:19:00	73.1	9.3	0.9	54.3	8.3
27 Oct 90	23:20:00	111.6	9.7	1.2	53.6	8.0
27 Oct 90	23:21:00	84.8	9.7	1.3	52.6	8.0
27 Oct 90	23:22:00	130.8	9.7	1.0	52.7	8.0
27 Oct 90	23:23:00	158.2	10.1	2.7	49.0	7.7
27 Oct 90	23:24:00	209.1	10.0	1.8	50.5	7.8
27 Oct 90	23:25:00	136.0	10.0	2.1	49.9	7.8
27 Oct 90	23:26:00	228.4	10.1	1.9	49.4	7.7
27 Oct 90	23:27:00	108.3	9.2	0.7	55.3	8.4
27 Oct 90	23:28:00	70.2	9.5	0.8	54.5	8.2
27 Oct 90	23:29:00	67.1	8.8	0.6	58.5	8.7
27 Oct 90	23:30:00	57.1	9.0	0.6	58.0	8.6
27 Oct 90	23:31:00	33.4	8.6	0.6	58.8	8.9
27 Oct 90	23:32:00	46.1	8.8	0.6	58.0	8.7
27 Oct 90	23:33:00	34.7	8.5	0.6	59.7	8.9
27 Oct 90	23:34:00	60.5	9.3	0.8	54.9	8.3
27 Oct 90	23:35:00	68.7	9.0	0.6	56.8	8.6
27 Oct 90	23:36:00	41.3	8.9	0.8	57.2	8.6
27 Oct 90	23:37:00	83.6	9.2	0.8	56.2	8.4
27 Oct 90	23:38:00	68.2	9.3	0.7	54.4	8.3
27 Oct 90	23:39:00	129.1	9.8	1.7	50.9	7.9
27 Oct 90	23:40:00	101.6	9.3	0.7	55.3	8.4
27 Oct 90	23:41:00	69.1	9.4	0.9	53.5	8.2
27 Oct 90	23:42:00	109.3	9.7	0.8	52.8	8.0
27 Oct 90	23:43:00	112.5	9.6	1.0	52.3	8.0
FLAMEOUT						
28 Oct 90	01:10:00	57.4	9.4		53.2	8.3
28 Oct 90	01:11:00	124.9	9.9		51.4	8.0
28 Oct 90	01:12:00	85.8	9.1		57.3	8.6
28 Oct 90	01:13:00	38.9	9.1		54.8	8.5
28 Oct 90	01:14:00	67.4	9.2		55.4	8.5
28 Oct 90	01:15:00	60.8	9.4		53.4	8.3
28 Oct 90	01:16:00	59.3	9.2		54.4	8.4
28 Oct 90	01:17:00	90.8	9.6		52.7	8.1
28 Oct 90	01:18:00	63.5	9.4		53.1	8.3
28 Oct 90	01:19:00	82.6	9.4		54.7	8.3
28 Oct 90	01:20:00	52.8	9.2		54.1	8.4
28 Oct 90	01:21:00	65.1	9.1		56.1	8.5
28 Oct 90	01:22:00	45.5	9.1		55.1	8.5
28 Oct 90	01:23:00	41.3	8.9		56.5	8.6
28 Oct 90	01:24:00	51.6	9.2		55.2	8.4
28 Oct 90	01:25:00	41.7	9.0		56.3	8.6
28 Oct 90	01:26:00	39.2	8.8		57.8	8.8
28 Oct 90	01:27:00	42.7	9.0		55.9	8.6
28 Oct 90	01:28:00	39.7	8.9		56.1	8.6
28 Oct 90	01:29:00	54.4	9.2		55.7	8.5
28 Oct 90	01:30:00	45.0	9.2		54.6	8.4
28 Oct 90	01:31:00	61.4	9.2		55.1	8.5
28 Oct 90	01:32:00	55.1	9.4		53.1	8.3
28 Oct 90	01:33:00	86.2	9.5		53.4	8.2
28 Oct 90	01:34:00	97.3	9.9		49.5	7.9
28 Oct 90	01:35:00	253.7	10.4		47.1	7.5
28 Oct 90	01:36:00	228.5	10.2		48.3	7.6
28 Oct 90	01:37:00	191.7	10.1		48.7	7.7
	AVERAGE	33.2	6.7	1.2	91.8	10.3
SPAN GAS VALUE		255.0	6.0	25.0	250.0	5.0

TEST T-1c

30 OCTOBER 1990

TITLE: RUN 1-C OIL BURN
NOTE :

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
30 Oct 90	10:19:00	6.0	5.4	0.4	124.8	11.5
30 Oct 90	10:20:00	6.8	5.4	0.4	122.2	11.5
30 Oct 90	10:21:00	7.1	5.1	0.4	126.2	11.8
30 Oct 90	10:22:00	7.3	5.0	0.4	125.8	11.8
30 Oct 90	10:23:00	7.2	5.5	0.4	122.4	11.4
30 Oct 90	10:24:00	7.4	5.5	0.4	122.0	11.5
30 Oct 90	10:25:00	7.4	5.5	0.4	122.7	11.5
30 Oct 90	10:26:00	7.6	5.5	0.4	121.8	11.4
30 Oct 90	10:27:00	7.6	5.3	0.4	124.0	11.6
30 Oct 90	10:28:00	7.7	5.3	0.4	124.5	11.6
30 Oct 90	10:29:00	7.1	5.4	0.5	124.9	11.5
30 Oct 90	10:30:00	7.1	5.1	0.6	126.1	11.8
30 Oct 90	10:31:00	7.1	5.0	0.6	127.6	11.9
30 Oct 90	10:32:00	7.1	5.0	0.6	127.9	11.8
30 Oct 90	10:33:00	7.1	5.1	0.5	127.5	11.8
30 Oct 90	10:34:00	7.1	5.1	0.5	128.5	11.8
30 Oct 90	10:35:00	7.1	5.1	0.5	128.3	11.8
30 Oct 90	10:36:00	7.1	5.4	0.4	125.9	11.5
30 Oct 90	10:37:00	6.9	5.3	0.4	127.3	11.6
30 Oct 90	10:38:00	7.1	5.2	0.5	127.3	11.7
30 Oct 90	10:39:00	7.1	5.1	0.5	128.4	11.8
30 Oct 90	10:40:00	7.1	4.8	0.7	130.1	12.0
30 Oct 90	10:41:00	7.5	4.9	0.6	128.9	11.9
30 Oct 90	10:42:00	7.1	5.6	0.5	124.0	11.4
30 Oct 90	10:43:00	7.1	5.4	0.4	125.2	11.5
30 Oct 90	10:44:00	7.1	5.3	0.4	125.7	11.7
30 Oct 90	10:45:00	7.1	5.2	0.4	127.7	11.7
30 Oct 90	10:46:00	7.1	5.2	0.4	127.2	11.7
30 Oct 90	10:47:00	8.0	5.1	0.4	126.1	11.8
30 Oct 90	10:48:00	7.4	5.2	0.4	124.6	11.7
30 Oct 90	10:49:00	7.8	5.2	0.4	125.3	11.7
30 Oct 90	10:50:00	7.7	5.1	0.5	125.1	11.8
30 Oct 90	10:51:00	7.9	5.1	0.5	125.0	11.8
30 Oct 90	10:52:00	7.8	5.5	0.4	122.2	11.4
30 Oct 90	10:53:00	8.0	5.5	0.4	123.3	11.5
30 Oct 90	10:54:00	8.0	5.3	0.5	124.9	11.7
30 Oct 90	10:55:00	8.0	5.0	0.9	127.9	11.9
30 Oct 90	10:56:00	7.1	5.1	0.6	128.2	11.8
30 Oct 90	10:57:00	7.1	5.1	0.5	127.7	11.8
30 Oct 90	10:58:00	7.1	5.1	0.4	128.0	11.8
30 Oct 90	10:59:00	7.1	5.1	0.4	128.7	11.8
30 Oct 90	11:00:00	7.1	5.2	0.4	128.6	11.8
30 Oct 90	11:01:00	6.7	5.2	0.4	127.2	11.7
30 Oct 90	11:02:00	6.8	5.2	0.5	129.0	11.8
30 Oct 90	11:03:00	7.7	4.9	0.5	128.6	12.0
30 Oct 90	11:04:00	8.0	5.2	0.5	125.5	11.7
30 Oct 90	11:05:00	8.0	5.2	0.5	123.6	11.7
30 Oct 90	11:06:00	6.9	5.7	2.1	124.1	11.3
30 Oct 90	11:07:00	6.4	4.7	3.7	135.7	12.2
30 Oct 90	11:08:00	6.1	4.8	1.7	135.0	12.1
30 Oct 90	11:09:00	6.0	4.7	1.4	135.5	12.1
30 Oct 90	11:10:00	6.0	4.8	1.3	135.4	12.1
30 Oct 90	11:11:00	5.7	4.7	1.2	135.1	12.1
30 Oct 90	11:12:00	6.0	4.8	1.0	133.7	12.1
30 Oct 90	11:13:00	8.1	4.5	1.0	131.0	12.3
30 Oct 90	11:14:00	7.7	5.3	0.8	124.2	11.6
30 Oct 90	11:15:00	6.1	5.0	0.8	132.5	11.9
30 Oct 90	11:16:00	6.0	4.6	0.8	136.5	12.2
30 Oct 90	11:17:00	6.0	4.6	0.7	136.9	12.2
30 Oct 90	11:18:00	6.0	4.6	0.7	137.6	12.2
30 Oct 90	11:19:00	6.4	4.7	0.7	134.1	12.1
30 Oct 90	11:20:00	6.0	4.8	0.7	133.5	12.0
30 Oct 90	11:21:00	6.0	4.7	0.8	135.2	12.1
30 Oct 90	11:22:00	7.0	4.6	0.8	134.3	12.2
30 Oct 90	11:23:00	6.1	5.0	0.7	131.7	11.9
30 Oct 90	11:24:00	6.0	4.8	1.7	135.9	12.0
30 Oct 90	11:25:00	6.0	4.5	1.1	138.1	12.3
30 Oct 90	11:26:00	6.0	5.0	0.8	134.0	11.9
30 Oct 90	11:27:00	6.0	4.8	0.8	134.8	12.1
30 Oct 90	11:28:00	6.0	4.6	0.8	135.4	12.2
30 Oct 90	11:29:00	6.0	4.8	0.8	134.4	12.0
30 Oct 90	11:30:00	6.0	4.8	0.8	134.3	12.0

RUN 1-C SLURRY
NOTE :

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
30 Oct 90	12:19:00	15.1	6.8	1.0	90.0	10.5
30 Oct 90	12:20:00	17.1	6.5	0.7	91.9	10.7
30 Oct 90	12:21:00	16.5	6.8	0.5	89.6	10.5
30 Oct 90	12:22:00	17.1	6.4	0.5	92.9	10.8
30 Oct 90	12:23:00	16.3	6.1	0.5	93.5	11.0
30 Oct 90	12:24:00	15.5	6.1	0.4	93.6	11.0
30 Oct 90	12:25:00	14.3	6.2	0.4	90.8	10.9
30 Oct 90	12:26:00	13.0	6.2	0.3	91.4	11.0
30 Oct 90	12:27:00	12.9	5.9	2.3	92.0	11.2
30 Oct 90	12:28:00	9.8	5.6	1.9	91.9	11.4
30 Oct 90	12:29:00	7.8	6.0	1.8	89.4	11.0
30 Oct 90	12:30:00	7.1	5.9	1.2	90.5	11.2
30 Oct 90	12:31:00	7.5	5.1	1.1	94.5	11.9
30 Oct 90	12:32:00	6.3	5.5	0.8	92.3	11.5
30 Oct 90	12:33:00	6.0	5.4	0.6	93.6	11.6
30 Oct 90	12:34:00	6.4	5.5	0.5	92.1	11.5
30 Oct 90	12:35:00	6.0	5.7	0.4	91.4	11.3
30 Oct 90	12:36:00	7.1	5.1	0.3	93.7	11.8
30 Oct 90	12:37:00	7.9	5.0	0.3	93.5	11.9
30 Oct 90	12:38:00	7.2	5.2	0.3	93.2	11.8
30 Oct 90	12:39:00	8.0	5.1	0.2	93.9	11.8
30 Oct 90	12:40:00	7.3	5.0	0.2	93.3	11.9
30 Oct 90	12:41:00	10.8	4.7	0.2	93.0	12.1
30 Oct 90	12:42:00	11.4	4.7	0.2	91.9	12.2
30 Oct 90	12:43:00	10.7	4.7	0.5	91.8	12.2
30 Oct 90	12:44:00	11.1	4.7	0.3	92.5	12.2
30 Oct 90	12:45:00	13.2	4.4	0.3	92.9	12.4
30 Oct 90	12:46:00	20.2	4.3	0.3	93.5	12.5
30 Oct 90	12:47:00	24.9	4.2	0.3	93.5	12.6
30 Oct 90	12:48:00	29.3	4.2	0.3	93.8	12.6
30 Oct 90	12:49:00	41.5	4.0	0.3	94.0	12.7
30 Oct 90	12:50:00	41.7	4.1	0.2	93.8	12.7
30 Oct 90	12:51:00	27.1	4.1	0.2	94.4	12.7
30 Oct 90	12:52:00	62.6	3.8	9.0	93.2	12.9
30 Oct 90	12:53:00	45.9	4.2	2.6	93.5	12.6
30 Oct 90	12:54:00	30.9	4.1	2.2	92.6	12.6
30 Oct 90	12:55:00	24.8	4.4	1.4	92.6	12.4
30 Oct 90	12:56:00	15.0	4.5	1.0	92.6	12.3
30 Oct 90	12:57:00	15.7	4.4	0.8	92.3	12.4
30 Oct 90	12:58:00	15.7	4.6	0.6	92.5	12.3
30 Oct 90	12:59:00	15.6	4.6	0.7	91.9	12.2
30 Oct 90	13:00:00	12.7	4.7	1.1	92.0	12.1
30 Oct 90	13:01:00	11.4	4.9	0.8	91.4	12.0
30 Oct 90	13:02:00	11.6	4.9	0.5	91.9	12.0
30 Oct 90	13:12:00	8.8	5.0	-0.3	91.2	11.9
30 Oct 90	13:13:00	9.7	5.0	-0.2	90.5	11.9
30 Oct 90	13:14:00	11.7	4.8	-0.2	91.2	12.1
30 Oct 90	13:15:00	13.0	4.6	-0.1	91.5	12.2
30 Oct 90	13:16:00	14.8	4.5	-0.1	91.2	12.3
30 Oct 90	13:17:00	19.1	4.4	-0.1	91.3	12.4
30 Oct 90	13:18:00	21.0	4.5	-0.1	91.7	12.3
30 Oct 90	13:19:00	19.3	4.5	-0.1	92.3	12.3
30 Oct 90	13:20:00	17.5	4.4	-0.1	92.3	12.3
30 Oct 90	13:21:00	15.6	4.7	0.1	91.1	12.1
30 Oct 90	13:22:00	16.6	4.6	0.5	90.4	12.2
30 Oct 90	13:23:00	13.2	4.8	0.2	90.8	12.0
30 Oct 90	13:24:00	11.6	4.8	0.1	90.8	12.0
30 Oct 90	13:25:00	10.2	4.9	0.0	91.1	12.0
30 Oct 90	13:26:00	10.2	4.9	0.0	91.0	12.0
30 Oct 90	13:27:00	10.7	4.8	-0.1	90.7	12.0
30 Oct 90	13:28:00	12.2	5.0	0.0	91.1	11.9
30 Oct 90	13:29:00	9.7	5.1	0.2	90.7	11.9
30 Oct 90	13:30:00	9.6	5.0	0.1	90.8	11.9
30 Oct 90	13:31:00	9.7	5.1	-0.0	89.5	11.8
30 Oct 90	13:32:00	9.5	5.1	0.0	90.6	11.9
30 Oct 90	13:33:00	9.0	5.0	0.0	90.2	11.9
30 Oct 90	13:34:00	9.6	5.1	-0.0	89.7	11.8
30 Oct 90	13:35:00	9.0	5.2	-0.1	89.1	11.7
30 Oct 90	13:36:00	8.3	5.2	-0.1	88.4	11.7
30 Oct 90	13:37:00	8.9	5.3	-0.1	89.2	11.7
30 Oct 90	13:38:00	8.7	5.3	-0.1	89.6	11.7
30 Oct 90	13:39:00	9.0	5.5	-0.1	89.4	11.5

30 Oct 90	13:40:00	9.0	5.1	-0.1	90.1	11.8
30 Oct 90	13:41:00	10.7	4.9	0.3	91.0	12.0
30 Oct 90	13:42:00	11.9	4.8	0.3	91.0	12.1
30 Oct 90	13:43:00	15.3	4.7	0.3	92.0	12.2
30 Oct 90	13:44:00	14.8	4.5	0.2	92.7	12.4
30 Oct 90	13:45:00	20.6	4.5	0.1	93.9	12.3
30 Oct 90	13:46:00	16.4	4.6	0.0	93.1	12.3
30 Oct 90	13:47:00	24.5	4.2	0.1	92.8	12.5
30 Oct 90	13:48:00	25.3	4.4	0.0	92.7	12.3
30 Oct 90	13:49:00	28.3	4.2	0.1	92.4	12.5
30 Oct 90	13:50:00	22.1	4.4	-0.0	92.4	12.4
30 Oct 90	13:51:00	20.1	4.5	-0.1	93.1	12.3
30 Oct 90	13:52:00	18.3	4.4	-0.1	93.1	12.4
30 Oct 90	13:53:00	16.8	4.5	-0.1	93.8	12.3
30 Oct 90	13:54:00	13.0	4.7	-0.1	92.8	12.1
30 Oct 90	13:55:00	13.3	4.8	-0.0	91.5	12.1
30 Oct 90	13:56:00	12.6	4.8	7.3	90.2	12.0
30 Oct 90	13:57:00	13.7	4.8	2.4	90.9	12.1
30 Oct 90	13:58:00	12.7	4.9	1.6	90.8	11.9
30 Oct 90	13:59:00	10.3	4.9	0.9	90.9	12.0
30 Oct 90	14:00:00	9.8	5.0	0.6	90.8	11.9
30 Oct 90	14:01:00	10.1	5.0	0.5	90.5	11.9
30 Oct 90	14:02:00	9.7	5.1	0.4	91.2	11.8
30 Oct 90	14:03:00	9.3	5.1	0.2	90.7	11.8
30 Oct 90	14:04:00	9.0	5.1	0.1	91.1	11.8
30 Oct 90	14:05:00	8.3	5.3	1.1	89.9	11.7
30 Oct 90	14:06:00	8.5	5.2	0.4	90.0	11.7
30 Oct 90	14:07:00	8.7	5.2	0.3	89.3	11.7
30 Oct 90	14:08:00	9.4	5.0	0.2	91.1	11.9
30 Oct 90	14:09:00	12.5	4.6	0.2	92.2	12.2
30 Oct 90	14:10:00	17.7	4.6	0.1	91.9	12.2
30 Oct 90	14:11:00	22.9	4.5	0.1	91.5	12.3
30 Oct 90	14:12:00	30.5	4.4	0.1	91.8	12.3
30 Oct 90	14:13:00	24.5	4.4	0.1	91.2	12.4
30 Oct 90	14:14:00	36.7	4.2	0.1	91.9	12.5
30 Oct 90	14:15:00	33.1	4.2	0.3	92.0	12.5
30 Oct 90	14:16:00	26.6	4.3	0.4	92.0	12.4
30 Oct 90	14:17:00	21.3	4.4	0.4	92.8	12.4
30 Oct 90	14:18:00	25.5	4.4	0.2	92.3	12.4
30 Oct 90	14:19:00	22.3	4.5	0.1	92.7	12.3
30 Oct 90	14:20:00	18.4	4.5	0.2	91.9	12.3
30 Oct 90	14:21:00	14.6	4.8	0.2	91.8	12.1
30 Oct 90	14:22:00	10.8	4.9	0.1	89.9	12.0
30 Oct 90	14:23:00	9.1	5.1	0.0	90.4	11.8
30 Oct 90	14:24:00	10.8	5.1	0.0	89.3	11.8
30 Oct 90	14:25:00	9.4	5.1	0.0	89.1	11.8
30 Oct 90	14:26:00	9.7	5.1	0.0	88.8	11.8
30 Oct 90	14:27:00	8.9	5.2	-0.0	89.5	11.7
30 Oct 90	14:28:00	13.1	4.7	0.5	90.0	12.2
30 Oct 90	14:29:00	14.4	4.8	2.0	90.8	12.1
30 Oct 90	14:30:00	11.1	4.9	1.1	90.3	12.0
30 Oct 90	14:31:00	12.5	4.9	2.0	89.9	11.9
30 Oct 90	14:32:00	11.3	4.8	1.2	90.0	12.0
30 Oct 90	14:33:00	10.0	5.1	0.7	89.9	11.8
30 Oct 90	14:34:00	9.5	5.0	0.4	90.2	11.9
30 Oct 90	14:35:00	9.1	5.2	0.3	90.0	11.8
30 Oct 90	14:36:00	11.9	5.0	0.6	75.2	11.2
30 Oct 90	14:45:00	181.1	3.7	0.6	94.0	12.9
30 Oct 90	14:46:00	158.8	3.4	0.8	93.3	13.1
30 Oct 90	14:47:00	112.4	3.7	0.2	93.4	12.9
30 Oct 90	14:48:00	119.8	3.6	0.5	93.3	13.0
30 Oct 90	14:49:00	132.5	3.5	0.4	92.4	13.1
30 Oct 90	14:50:00	89.7	4.0	0.8	94.3	12.7
30 Oct 90	14:51:00	64.3	3.8	0.5	93.2	12.8
30 Oct 90	14:52:00	70.4	3.9	0.5	92.3	12.8
30 Oct 90	14:53:00	78.5	3.8	0.6	92.5	12.8
30 Oct 90	14:54:00	88.8	3.7	0.4	93.0	13.0
30 Oct 90	14:55:00	63.1	4.0	0.2	93.1	12.7
30 Oct 90	14:56:00	80.2	3.7	0.4	91.2	12.9
30 Oct 90	14:57:00	49.2	4.2	0.2	92.9	12.5
30 Oct 90	14:58:00	37.6	4.1	0.2	91.3	12.6
30 Oct 90	14:59:00	28.7	4.2	0.1	92.0	12.5
30 Oct 90	15:00:00	25.4	4.2	0.1	92.8	12.5
30 Oct 90	15:01:00	35.6	4.1	2.4	91.7	12.6
30 Oct 90	15:02:00	24.9	4.5	1.5	92.2	12.3
30 Oct 90	15:03:00	19.5	4.5	1.1	92.2	12.3
30 Oct 90	15:04:00	21.1	4.3	1.1	92.3	12.4
30 Oct 90	15:05:00	44.9	3.9	0.9	92.4	12.7
30 Oct 90	15:06:00	54.0	4.0	0.7	93.6	12.6

30 Oct 90	15:07:00	76.7	3.7	0.7	94.1	12.9
30 Oct 90	15:08:00	121.6	3.5	1.4	93.2	13.1
30 Oct 90	15:09:00	165.6	3.4	1.2	93.3	13.1
30 Oct 90	15:10:00	182.7	3.4	1.2	93.4	13.1
30 Oct 90	15:11:00	104.8	3.6	1.5	93.4	12.9
30 Oct 90	15:12:00	216.2	3.3	1.7	93.2	13.2
30 Oct 90	15:13:00	178.5	3.4	1.5	93.9	13.1
30 Oct 90	15:14:00	136.1	3.5	1.0	94.4	13.1
30 Oct 90	15:15:00	117.9	3.6	0.8	93.4	13.0
30 Oct 90	15:16:00	101.7	3.7	0.8	92.5	12.9
30 Oct 90	15:17:00	103.8	3.7	0.8	92.9	12.9
30 Oct 90	15:18:00	66.3	3.8	0.6	93.2	12.9
30 Oct 90	15:19:00	80.8	3.8	0.5	92.5	12.8
30 Oct 90	15:20:00	47.2	4.2	0.4	92.0	12.6
30 Oct 90	15:21:00	32.5	4.3	0.3	91.0	12.5
30 Oct 90	15:22:00	27.5	4.3	0.3	92.1	12.4
30 Oct 90	15:23:00	22.0	4.3	0.3	91.2	12.4
30 Oct 90	15:24:00	20.7	4.5	0.3	92.1	12.3
30 Oct 90	15:25:00	25.5	4.3	0.3	91.6	12.4
30 Oct 90	15:26:00	17.9	4.5	0.3	92.6	12.3
30 Oct 90	15:27:00	16.5	4.6	0.2	92.2	12.2
30 Oct 90	15:28:00	20.4	4.6	0.1	92.7	12.2
30 Oct 90	15:29:00	15.9	4.6	1.0	92.0	12.2
30 Oct 90	15:30:00	13.7	4.7	0.6	92.1	12.1
30 Oct 90	15:31:00	12.5	4.9	0.7	91.4	12.0
30 Oct 90	15:32:00	11.3	4.9	0.4	92.2	12.0
30 Oct 90	15:33:00	18.4	4.4	0.3	93.8	12.4
30 Oct 90	15:34:00	20.2	4.3	0.2	93.7	12.5
30 Oct 90	15:35:00	34.6	4.0	0.2	94.3	12.7
30 Oct 90	15:36:00	55.2	3.9	0.2	94.4	12.8
30 Oct 90	15:37:00	57.4	3.8	0.1	94.7	12.8
30 Oct 90	15:38:00	47.5	4.1	0.1	94.9	12.6
30 Oct 90	15:39:00	51.9	3.9	0.1	94.7	12.8
30 Oct 90	15:40:00	46.6	3.9	0.1	95.5	12.8
30 Oct 90	15:41:00	66.3	3.9	0.1	94.4	12.8
30 Oct 90	15:42:00	40.2	3.9	0.0	95.4	12.8
30 Oct 90	15:43:00	42.3	4.1	0.1	95.1	12.6
30 Oct 90	15:44:00	61.3	4.0	0.0	94.1	12.7
30 Oct 90	15:45:00	34.2	4.2	0.0	93.8	12.5
30 Oct 90	15:46:00	35.5	4.1	0.0	92.8	12.6
30 Oct 90	15:47:00	37.2	4.3	0.4	93.0	12.4
30 Oct 90	15:48:00	36.0	4.3	0.1	92.8	12.4
30 Oct 90	15:49:00	33.7	4.3	0.0	93.2	12.5
30 Oct 90	15:50:00	35.8	4.1	0.0	93.2	12.6
30 Oct 90	15:51:00	26.3	4.5	-0.0	92.1	12.3
30 Oct 90	15:52:00	20.6	4.3	0.0	92.4	12.4
30 Oct 90	15:53:00	26.5	4.4	3.8	91.7	12.4
30 Oct 90	15:54:00	22.5	4.4	3.9	92.6	12.4
30 Oct 90	15:55:00	35.2	4.2	1.5	91.8	12.5
30 Oct 90	15:56:00	26.1	4.5	0.7	91.7	12.3
30 Oct 90	15:57:00	20.8	4.5	0.5	90.8	12.3
30 Oct 90	15:58:00	20.5	4.5	0.3	91.7	12.2
30 Oct 90	15:59:00	16.6	4.7	0.1	92.2	12.1
30 Oct 90	16:00:00	15.5	4.6	0.1	92.9	12.2
30 Oct 90	16:01:00	24.9	4.4	0.1	93.2	12.4
30 Oct 90	16:02:00	42.9	4.2	0.1	94.7	12.5
30 Oct 90	16:03:00	31.8	4.2	0.0	94.1	12.5
30 Oct 90	16:04:00	53.1	3.9	0.0	94.1	12.8
30 Oct 90	16:05:00	34.0	4.5	-0.1	93.1	12.3
30 Oct 90	16:06:00	29.4	4.3	0.1	90.6	12.4
30 Oct 90	16:07:00	39.8	4.2	0.1	91.8	12.5
	AVERAGE	31.6	4.6	0.5	92.0	12.2
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	-0.4	0.1	0.0
	AVERAGE BIAS SPAN	252.1	5.8	22.7	237.5	5.0
	BIAS CORRECTED AVG	31.1	4.7	1.0	96.8	12.2

RUN 1-C ACETONE
NOTE :

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
30 Oct 90	16:15:00	11.6	4.9	2.4	124.9	11.9
30 Oct 90	16:16:00	12.4	5.0	1.7	123.8	11.8
30 Oct 90	16:17:00	10.5	5.3	1.3	122.9	11.6
30 Oct 90	16:18:00	11.3	5.0	1.0	124.9	11.9
30 Oct 90	16:19:00	11.1	4.9	0.8	125.0	12.0
30 Oct 90	16:20:00	11.1	5.3	0.7	120.6	11.6
30 Oct 90	16:21:00	9.7	5.4	0.6	120.8	11.6
30 Oct 90	16:22:00	10.6	5.3	0.7	122.0	11.7
30 Oct 90	16:23:00	10.3	5.2	0.4	121.8	11.7
30 Oct 90	16:24:00	10.6	5.2	0.2	121.0	11.7
30 Oct 90	16:26:00	11.3	5.2	0.2	120.4	11.7
30 Oct 90	16:27:00	10.7	5.4	0.1	120.0	11.6
30 Oct 90	16:28:00	8.9	5.4	0.1	121.2	11.6
30 Oct 90	16:29:00	8.9	5.1	0.1	124.8	11.8
30 Oct 90	16:30:00	9.6	5.2	0.2	123.8	11.8
30 Oct 90	16:31:00	9.0	5.2	0.3	124.4	11.7
30 Oct 90	16:32:00	8.8	5.2	0.1	124.7	11.7
30 Oct 90	16:33:00	9.2	5.2	0.0	124.6	11.7
30 Oct 90	16:34:00	8.1	5.3	0.0	123.9	11.6
30 Oct 90	16:35:00	8.6	5.3	0.1	123.3	11.6
30 Oct 90	16:36:00	8.0	5.3	0.0	125.0	11.6
30 Oct 90	16:37:00	8.0	5.3	-0.1	124.1	11.6
30 Oct 90	16:38:00	8.6	5.3	-0.1	123.2	11.7
30 Oct 90	16:39:00	9.4	5.2	-0.1	123.5	11.7
30 Oct 90	16:40:00	8.9	5.3	-0.1	124.3	11.7
30 Oct 90	16:41:00	9.2	5.3	-0.2	123.0	11.6
30 Oct 90	16:42:00	9.4	5.3	-0.2	122.3	11.7
30 Oct 90	16:43:00	9.1	5.4	-0.2	120.9	11.6
30 Oct 90	16:44:00	9.4	5.3	-0.2	121.3	11.6
30 Oct 90	16:45:00	8.5	5.3	-0.1	124.5	11.6
30 Oct 90	16:46:00	8.9	5.3	-0.2	122.8	11.6
30 Oct 90	16:47:00	8.9	5.3	-0.2	123.6	11.6
30 Oct 90	16:48:00	8.5	5.4	-0.2	124.4	11.6
30 Oct 90	16:49:00	8.9	5.4	-0.2	124.0	11.6
30 Oct 90	16:50:00	8.6	5.4	-0.2	124.2	11.6
30 Oct 90	16:51:00	8.3	5.4	-0.2	125.0	11.6
30 Oct 90	16:52:00	8.3	5.4	0.2	125.1	11.6
30 Oct 90	16:53:00	8.6	5.4	0.0	123.0	11.6
30 Oct 90	16:54:00	8.9	5.4	-0.0	124.1	11.6
30 Oct 90	16:55:00	8.6	5.4	-0.1	122.9	11.5
30 Oct 90	16:56:00	8.0	5.5	-0.2	125.1	11.5
30 Oct 90	16:57:00	7.5	5.4	-0.2	126.2	11.6
30 Oct 90	16:58:00	8.3	5.2	1.4	128.9	11.8
30 Oct 90	16:59:00	8.3	5.0	0.4	131.6	11.9
30 Oct 90	17:00:00	8.0	5.1	0.4	128.5	11.8
30 Oct 90	17:01:00	7.1	5.6	0.0	125.3	11.4
30 Oct 90	17:02:00	8.0	5.2	-0.1	128.8	11.7
30 Oct 90	17:03:00	7.2	5.2	-0.1	127.4	11.7
30 Oct 90	17:04:00	8.0	5.2	-0.2	128.9	11.8
30 Oct 90	17:05:00	8.2	5.2	-0.2	127.9	11.8
30 Oct 90	17:06:00	8.0	5.3	-0.2	127.9	11.7
30 Oct 90	17:07:00	8.2	5.2	-0.2	126.8	11.7
30 Oct 90	17:08:00	8.8	5.2	-0.3	128.0	11.8
30 Oct 90	17:09:00	8.0	5.2	-0.3	127.2	11.8
30 Oct 90	17:10:00	8.0	5.3	-0.3	124.8	11.7
30 Oct 90	17:11:00	8.3	5.2	-0.2	125.3	11.7
30 Oct 90	17:12:00	8.7	5.2	-0.2	125.2	11.8
30 Oct 90	17:13:00	9.4	4.8	-0.2	128.0	12.1
30 Oct 90	17:14:00	8.6	5.2	0.2	122.9	11.7
30 Oct 90	17:15:00	7.7	5.4	-0.2	123.1	11.6
30 Oct 90	17:16:00	8.5	5.1	-0.2	125.3	11.8
30 Oct 90	17:17:00	9.0	5.1	-0.2	125.4	11.8
30 Oct 90	17:18:00	9.0	5.2	-0.2	125.7	11.8
30 Oct 90	17:19:00	8.0	5.6	-0.3	122.7	11.4
30 Oct 90	17:20:00	8.0	5.5	-0.3	124.0	11.5
30 Oct 90	17:21:00	8.5	5.1	-0.3	128.0	11.8
30 Oct 90	17:22:00	8.2	5.3	-0.3	125.3	11.6
30 Oct 90	17:23:00	7.4	5.3	-0.3	125.3	11.6
30 Oct 90	17:24:00	8.0	5.3	-0.3	125.0	11.6
30 Oct 90	17:25:00	8.0	5.0	-0.3	128.4	11.8
30 Oct 90	17:26:00	8.6	5.0	1.3	128.6	11.9
30 Oct 90	17:27:00	7.8	5.0	1.1	128.9	11.8

30 Oct 90	17:28:00	7.2	5.6	0.5	124.2	11.4
30 Oct 90	17:29:00	7.4	5.2	0.2	129.7	11.7
30 Oct 90	17:30:00	7.9	4.9	0.0	130.9	12.0
30 Oct 90	17:31:00	8.6	4.9	-0.0	129.9	11.9
30 Oct 90	17:32:00	8.1	5.5	-0.2	125.1	11.4
30 Oct 90	17:33:00	8.0	5.1	-0.2	130.0	11.8
30 Oct 90	17:34:00	7.7	5.1	-0.2	129.6	11.8
30 Oct 90	17:35:00	7.9	5.0	-0.2	129.4	11.8
30 Oct 90	17:36:00	7.5	5.2	-0.3	128.0	11.7
30 Oct 90	17:37:00	7.1	5.4	-0.3	125.8	11.5
30 Oct 90	17:38:00	7.1	5.3	-0.3	128.4	11.6
30 Oct 90	17:39:00	7.6	4.9	-0.3	131.7	11.9
30 Oct 90	17:40:00	8.0	5.0	-0.3	129.1	11.8
30 Oct 90	17:41:00	7.5	5.6	-0.3	124.7	11.4
30 Oct 90	17:42:00	8.0	5.2	-0.3	128.1	11.7
30 Oct 90	17:43:00	8.0	5.1	-0.4	129.0	11.7
30 Oct 90	17:44:00	7.7	5.1	-0.4	128.2	11.7
30 Oct 90	17:45:00	8.2	5.2	-0.1	127.5	11.7
30 Oct 90	17:46:00	8.0	5.2	-0.2	127.6	11.7
30 Oct 90	17:47:00	8.8	5.1	-0.3	128.3	11.7
30 Oct 90	17:48:00	8.3	5.2	-0.3	127.5	11.7
30 Oct 90	17:49:00	8.0	5.2	-0.3	127.4	11.7
30 Oct 90	17:50:00	8.0	5.5	-0.4	122.9	11.4
30 Oct 90	17:51:00	7.2	5.5	-0.3	125.9	11.4
30 Oct 90	17:52:00	7.7	5.1	-0.2	131.2	11.8
30 Oct 90	17:53:00	7.4	5.0	-0.2	132.3	11.8
30 Oct 90	17:54:00	7.7	5.0	-0.3	130.9	11.8
30 Oct 90	17:55:00	7.5	5.2	4.0	129.3	11.7
30 Oct 90	17:56:00	7.1	5.1	1.2	129.9	11.8
30 Oct 90	17:57:00	7.4	5.1	0.5	130.0	11.8
30 Oct 90	17:58:00	7.4	4.8	0.2	133.3	12.0
30 Oct 90	17:59:00	7.7	4.8	0.0	133.7	12.0
30 Oct 90	18:00:00	7.5	5.1	-0.1	129.2	11.7
30 Oct 90	18:01:00	7.1	5.4	-0.2	127.8	11.5
30 Oct 90	18:02:00	6.7	5.1	-0.2	129.2	11.8
30 Oct 90	18:03:00	7.9	4.7	-0.2	132.4	12.1
30 Oct 90	18:04:00	8.0	4.7	-0.2	132.1	12.1
30 Oct 90	18:05:00	7.4	5.3	-0.3	126.6	11.6
30 Oct 90	18:06:00	7.4	5.4	-0.3	126.8	11.6
30 Oct 90	18:07:00	7.4	5.2	-0.3	128.7	11.7
30 Oct 90	18:08:00	7.8	5.2	-0.3	127.4	11.7
30 Oct 90	18:09:00	7.7	5.2	-0.2	127.2	11.7
30 Oct 90	18:10:00	8.0	5.1	-0.3	127.7	11.8
30 Oct 90	18:11:00	8.5	4.7	-0.3	131.3	12.1
30 Oct 90	18:12:00	8.0	5.3	-0.3	125.1	11.6
30 Oct 90	18:13:00	7.1	5.4	-0.4	125.7	11.5
30 Oct 90	18:14:00	8.0	5.1	-0.3	128.3	11.8
30 Oct 90	18:15:00	8.2	5.0	-0.3	130.1	11.9
30 Oct 90	18:16:00	8.0	5.0	-0.3	129.5	11.9
30 Oct 90	18:17:00	8.3	5.1	-0.3	129.7	11.8
30 Oct 90	18:18:00	7.4	5.1	-0.3	129.2	11.8
30 Oct 90	18:19:00	7.4	5.1	-0.4	130.6	11.8
30 Oct 90	18:20:00	7.4	5.1	-0.4	129.2	11.8
30 Oct 90	18:21:00	7.7	5.2	-0.4	128.9	11.7
30 Oct 90	18:22:00	7.5	5.1	0.4	129.2	11.8
30 Oct 90	18:23:00	7.1	5.2	-0.2	129.3	11.7
30 Oct 90	18:24:00	7.1	5.2	-0.3	128.7	11.7
30 Oct 90	18:25:00	7.2	5.1	-0.3	130.3	11.7
30 Oct 90	18:26:00	7.0	5.1	-0.3	129.6	11.8
30 Oct 90	18:27:00	7.7	4.8	-0.3	133.4	12.0
30 Oct 90	18:28:00	8.5	4.9	-0.3	130.7	11.9
30 Oct 90	18:29:00	7.2	5.3	-0.4	128.5	11.6
30 Oct 90	18:30:00	8.0	5.0	-0.4	132.0	11.8
30 Oct 90	18:31:00	7.7	5.0	-0.4	131.2	11.8
30 Oct 90	18:32:00	7.7	5.0	-0.4	130.3	11.9
30 Oct 90	18:33:00	7.7	5.0	-0.4	130.1	11.8
30 Oct 90	18:34:00	7.8	5.1	-0.4	129.0	11.8
30 Oct 90	18:35:00	7.9	5.0	-0.2	130.3	11.8
30 Oct 90	18:36:00	7.8	5.0	-0.3	129.3	11.8
30 Oct 90	18:37:00	8.2	5.0	-0.4	130.1	11.8
30 Oct 90	18:38:00	8.0	5.6	-0.4	123.7	11.4
30 Oct 90	18:39:00	7.5	5.3	-0.4	128.0	11.6
30 Oct 90	18:40:00	8.0	5.0	-0.4	130.7	11.8
30 Oct 90	18:41:00	7.4	5.0	-0.4	132.2	11.8
30 Oct 90	18:42:00	7.2	5.1	-0.4	131.4	11.8
30 Oct 90	18:43:00	7.1	5.1	-0.4	132.0	11.8
30 Oct 90	18:44:00	7.1	5.0	-0.4	132.1	11.8
30 Oct 90	18:45:00	6.7	5.1	-0.4	131.6	11.8
30 Oct 90	18:46:00	6.5	5.1	-0.4	131.7	11.8

30 Oct 90	18:47:00	6.7	5.1	-0.4	131.9	11.8
30 Oct 90	18:48:00	6.7	5.1	-0.4	131.5	11.8
30 Oct 90	18:49:00	6.0	5.1	-0.4	131.7	11.8
30 Oct 90	18:50:00	6.5	5.1	-0.5	132.7	11.8
30 Oct 90	18:51:00	7.0	5.0	-0.5	131.8	11.8
30 Oct 90	18:52:00	6.9	5.0	-0.2	132.1	11.8
30 Oct 90	18:53:00	6.7	5.1	-0.4	130.6	11.8
30 Oct 90	18:54:00	7.2	5.0	-0.4	131.0	11.8
30 Oct 90	18:55:00	7.5	5.0	-0.4	131.0	11.8
30 Oct 90	18:56:00	7.2	5.1	-0.4	131.3	11.8
30 Oct 90	18:57:00	7.0	5.1	-0.5	131.1	11.8
30 Oct 90	18:58:00	7.0	5.1	-0.4	131.0	11.8
30 Oct 90	18:59:00	7.0	5.0	-0.4	131.4	11.8
30 Oct 90	19:00:00	7.4	5.1	0.2	131.6	11.8
30 Oct 90	19:01:00	7.4	5.0	-0.3	132.1	11.8
30 Oct 90	19:02:00	7.1	5.1	-0.3	131.7	11.8
30 Oct 90	19:03:00	7.0	5.0	-0.3	131.8	11.8
30 Oct 90	19:04:00	7.1	5.1	-0.4	132.2	11.8
30 Oct 90	19:05:00	6.7	5.2	-0.4	131.5	11.7
30 Oct 90	19:06:00	6.0	5.2	-0.4	131.1	11.7
30 Oct 90	19:07:00	7.0	4.8	-0.4	134.1	12.0
30 Oct 90	19:08:00	8.6	4.6	-0.4	135.2	12.2
30 Oct 90	19:09:00	6.7	5.3	-0.5	128.9	11.6
30 Oct 90	19:10:00	7.1	5.2	-0.4	130.8	11.6
30 Oct 90	19:11:00	7.2	4.9	-0.4	132.9	11.9
30 Oct 90	19:12:00	8.0	4.9	-0.4	132.8	11.9
30 Oct 90	19:13:00	8.0	4.9	-0.4	133.1	11.9
30 Oct 90	19:14:00	8.0	5.0	-0.5	131.4	11.8
30 Oct 90	19:15:00	7.4	5.5	-0.5	128.6	11.4
30 Oct 90	19:16:00	7.5	5.0	-0.4	133.6	11.9
30 Oct 90	19:17:00	8.0	5.0	-0.4	132.0	11.9
30 Oct 90	19:18:00	7.4	5.0	-0.5	133.8	11.8
30 Oct 90	19:19:00	7.1	5.0	-0.5	134.6	11.9
30 Oct 90	19:20:00	7.4	4.9	-0.3	133.9	11.9
30 Oct 90	19:21:00	7.1	5.0	2.0	133.3	11.9
30 Oct 90	19:22:00	7.1	5.0	1.1	134.0	11.9
30 Oct 90	19:23:00	7.5	5.0	0.5	134.4	11.9
30 Oct 90	19:24:00	7.7	4.9	0.1	133.8	11.9
30 Oct 90	19:25:00	7.7	4.9	-0.0	132.9	11.9
30 Oct 90	19:26:00	8.6	4.6	-0.1	135.6	12.2
30 Oct 90	19:27:00	8.1	4.6	-0.2	137.1	12.1
30 Oct 90	19:28:00	7.1	4.7	-0.3	137.3	12.1
30 Oct 90	19:29:00	7.7	4.6	-0.3	136.4	12.2
30 Oct 90	19:30:00	7.8	4.7	-0.3	136.6	12.1
30 Oct 90	19:31:00	6.7	5.4	-0.4	129.6	11.5
30 Oct 90	19:32:00	6.0	5.0	-0.2	132.4	11.8
30 Oct 90	19:33:00	13.8	7.0	-0.1	114.1	10.3
30 Oct 90	19:34:00	434.5	3.7	42.9	107.8	13.0
30 Oct 90	19:35:00	465.9	2.3	105.7	93.8	13.9
30 Oct 90	19:36:00	525.8	3.7	4.1	85.2	13.2
30 Oct 90	19:37:00	25.2	5.8	-0.1	71.5	11.7
30 Oct 90	19:38:00	40.3	6.7	45.9	68.8	11.0
30 Oct 90	19:39:00	43.8	4.8	4.8	68.1	12.6
30 Oct 90	19:40:00	10.6	4.4	1.3	67.4	13.0
30 Oct 90	19:41:00	25.1	3.3	0.7	69.0	13.9
30 Oct 90	19:42:00	19.4	3.6	0.3	66.9	13.6
30 Oct 90	19:43:00	14.2	4.0	0.1	66.8	13.4
30 Oct 90	19:44:00	11.7	4.0	0.0	66.1	13.4
30 Oct 90	19:45:00	11.6	4.0	-0.0	65.7	13.4
30 Oct 90	19:46:00	10.8	4.1	-0.1	66.3	13.3
30 Oct 90	19:47:00	11.9	4.1	-0.2	65.9	13.3
30 Oct 90	19:48:00	10.2	4.1	0.4	66.4	13.3
30 Oct 90	19:49:00	10.6	4.1	0.2	66.6	13.3
30 Oct 90	19:50:00	11.4	4.1	0.1	66.5	13.3
30 Oct 90	19:51:00	9.2	4.2	0.0	66.6	13.2
30 Oct 90	19:52:00	8.9	4.3	-0.1	66.8	13.1
30 Oct 90	19:53:00	8.3	4.4	-0.1	65.3	13.0
30 Oct 90	19:54:00	8.3	4.4	-0.1	65.5	13.0
30 Oct 90	19:55:00	8.7	4.4	-0.2	65.9	13.0
30 Oct 90	19:56:00	7.8	4.4	-0.3	65.8	13.0
30 Oct 90	19:57:00	7.7	4.4	-0.3	66.3	13.0
30 Oct 90	19:58:00	8.3	4.4	-0.3	65.7	13.0
30 Oct 90	19:59:00	7.6	4.5	-0.3	65.5	12.9
30 Oct 90	20:00:00	7.2	4.5	-0.4	65.6	12.9
30 Oct 90	20:01:00	7.5	4.5	-0.4	65.3	12.9
30 Oct 90	20:02:00	7.5	4.5	-0.4	65.7	12.9
30 Oct 90	20:03:00	7.2	4.6	-0.4	64.7	12.9
30 Oct 90	20:04:00	7.0	4.6	-0.4	65.1	12.9
30 Oct 90	20:05:00	7.0	4.7	-0.4	65.6	12.8

30 Oct 90	20:06:00	6.3	4.7	1.2	64.4	12.8
30 Oct 90	20:07:00	14.7	3.9	1.1	67.5	13.5
30 Oct 90	20:08:00	105.8	2.2	0.8	71.3	14.7
30 Oct 90	20:09:00	80.8	2.4	0.6	71.4	14.6
30 Oct 90	20:10:00	58.8	2.7	0.4	70.8	14.4
30 Oct 90	20:11:00	45.5	2.8	0.3	70.8	14.3
30 Oct 90	20:12:00	35.6	2.9	0.1	69.9	14.2
30 Oct 90	20:13:00	20.9	4.2	-0.1	66.8	13.2
30 Oct 90	20:14:00	8.3	4.4	-0.2	66.7	13.0
30 Oct 90	20:15:00	8.6	4.4	-0.2	66.8	13.0
30 Oct 90	20:16:00	8.0	4.4	-0.3	66.1	13.0
30 Oct 90	20:17:00	7.5	4.5	-0.3	66.7	13.0
30 Oct 90	20:18:00	7.8	4.4	-0.3	66.6	13.0
30 Oct 90	20:19:00	7.2	4.4	-0.3	67.2	13.0
30 Oct 90	20:20:00	7.5	4.4	-0.3	67.5	13.0
30 Oct 90	20:21:00	7.0	4.5	0.5	66.6	12.9
30 Oct 90	20:22:00	7.3	4.5	0.2	66.6	13.0
30 Oct 90	20:23:00	8.0	4.4	-0.1	67.4	13.0
30 Oct 90	20:24:00	8.0	4.4	-0.2	66.9	13.0
30 Oct 90	20:25:00	7.4	4.4	-0.3	67.3	13.0
30 Oct 90	20:26:00	7.7	4.4	-0.3	66.8	13.1
30 Oct 90	20:27:00	7.5	4.4	-0.3	66.3	13.0
30 Oct 90	20:28:00	8.1	4.4	-0.3	67.3	13.0
30 Oct 90	20:29:00	7.5	4.4	-0.3	67.2	13.1
30 Oct 90	20:30:00	8.9	4.3	-0.3	67.1	13.1
30 Oct 90	20:31:00	8.5	4.2	-0.4	67.9	13.2
30 Oct 90	20:32:00	9.1	4.3	-0.4	66.9	13.1
30 Oct 90	20:33:00	7.3	4.5	-0.4	66.0	12.9
30 Oct 90	20:34:00	7.0	4.6	-0.2	65.7	12.9
30 Oct 90	20:35:00	8.0	4.4	-0.1	66.3	13.0
30 Oct 90	20:36:00	6.7	4.6	-0.3	66.0	12.8
30 Oct 90	20:37:00	6.2	4.7	-0.3	65.3	12.7
30 Oct 90	20:38:00	6.0	4.8	-0.4	64.5	12.7
30 Oct 90	20:39:00	6.0	4.8	-0.4	64.9	12.7
30 Oct 90	20:40:00	6.2	4.8	-0.3	64.8	12.7
30 Oct 90	20:41:00	6.5	4.8	-0.4	65.2	12.7
30 Oct 90	20:42:00	6.0	4.8	-0.2	65.2	12.7
30 Oct 90	20:43:00	6.0	4.8	-0.4	65.1	12.7
30 Oct 90	20:44:00	5.8	4.8	-0.4	64.9	12.6
30 Oct 90	20:45:00	5.8	4.9	-0.4	64.4	12.6
30 Oct 90	20:46:00	6.0	4.9	-0.5	63.9	12.6
30 Oct 90	20:47:00	6.2	4.9	-0.5	64.6	12.6
30 Oct 90	20:48:00	6.3	4.9	-0.5	65.2	12.6
30 Oct 90	20:49:00	6.0	4.9	-0.5	63.8	12.6
30 Oct 90	20:50:00	6.0	4.9	-0.5	64.4	12.6
30 Oct 90	20:51:00	6.0	4.8	-0.3	64.3	12.7
30 Oct 90	20:52:00	6.5	4.8	-0.4	64.3	12.7
30 Oct 90	20:53:00	6.0	4.9	-0.5	64.1	12.6
30 Oct 90	20:54:00	6.2	4.9	-0.5	64.5	12.6
30 Oct 90	20:55:00	6.3	4.8	-0.5	63.9	12.7
30 Oct 90	20:56:00	6.0	4.8	-0.4	64.5	12.7
30 Oct 90	20:57:00	6.2	4.8	-0.4	64.9	12.7
30 Oct 90	20:58:00	6.8	4.8	-0.4	64.3	12.7
30 Oct 90	20:59:00	6.5	4.8	-0.5	65.5	12.7
30 Oct 90	21:00:00	6.0	4.8	-0.5	65.0	12.7
30 Oct 90	21:01:00	6.7	4.7	-0.4	64.8	12.8
30 Oct 90	21:02:00	6.7	4.7	-0.4	65.1	12.8
	AVERAGE	14.3	4.9	0.6	109.4	12.1
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	-0.3	0.1	0.0
	AVERAGE BIAS SPAN	257.1	5.8	22.6	238.0	5.1
	BIAS CORRECTED AVG	13.2	5.1	1.0	114.8	11.9

RUN 1-C PARTICULATE
NOTE :

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
30 Oct 90	13:12:00	8.8	5.0	-0.3	91.2	11.9
30 Oct 90	13:13:00	9.7	5.0	-0.2	90.5	11.9
30 Oct 90	13:14:00	11.7	4.8	-0.2	91.2	12.1
30 Oct 90	13:15:00	13.0	4.6	-0.1	91.5	12.2
30 Oct 90	13:16:00	14.8	4.5	-0.1	91.2	12.3
30 Oct 90	13:17:00	19.1	4.4	-0.1	91.3	12.4
30 Oct 90	13:18:00	21.0	4.5	-0.1	91.7	12.3
30 Oct 90	13:19:00	19.3	4.5	-0.1	92.3	12.3
30 Oct 90	13:20:00	17.5	4.4	-0.1	92.3	12.3
30 Oct 90	13:21:00	15.6	4.7	0.1	91.1	12.1
30 Oct 90	13:22:00	16.6	4.6	0.5	90.4	12.2
30 Oct 90	13:23:00	13.2	4.8	0.2	90.8	12.0
30 Oct 90	13:24:00	11.6	4.8	0.1	90.8	12.0
30 Oct 90	13:25:00	10.2	4.9	0.0	91.1	12.0
30 Oct 90	13:26:00	10.2	4.9	0.0	91.0	12.0
30 Oct 90	13:27:00	10.7	4.8	-0.1	90.7	12.0
30 Oct 90	13:28:00	12.2	5.0	0.0	91.1	11.9
30 Oct 90	13:29:00	9.7	5.1	0.2	90.7	11.9
30 Oct 90	13:30:00	9.6	5.0	0.1	90.8	11.9
30 Oct 90	13:31:00	9.7	5.1	-0.0	89.5	11.8
30 Oct 90	13:32:00	9.5	5.1	0.0	90.6	11.9
30 Oct 90	13:33:00	9.0	5.0	0.0	90.2	11.9
30 Oct 90	13:34:00	9.6	5.1	-0.0	89.7	11.8
30 Oct 90	13:35:00	9.0	5.2	-0.1	89.1	11.7
30 Oct 90	13:36:00	8.3	5.2	-0.1	88.4	11.7
30 Oct 90	13:37:00	8.9	5.3	-0.1	89.2	11.7
30 Oct 90	13:38:00	8.7	5.3	-0.1	89.6	11.7
30 Oct 90	13:39:00	9.0	5.5	-0.1	89.4	11.5
30 Oct 90	13:40:00	9.0	5.1	-0.1	90.1	11.8
30 Oct 90	13:41:00	10.7	4.9	0.3	91.0	12.0
30 Oct 90	13:42:00	11.9	4.8	0.3	91.0	12.1
30 Oct 90	13:43:00	15.3	4.7	0.3	92.0	12.2
30 Oct 90	13:44:00	14.8	4.5	0.2	92.7	12.4
30 Oct 90	13:45:00	20.6	4.5	0.1	93.9	12.3
30 Oct 90	13:46:00	16.4	4.6	0.0	93.1	12.3
30 Oct 90	13:47:00	24.5	4.2	0.1	92.8	12.5
30 Oct 90	13:48:00	25.3	4.4	0.0	92.7	12.3
30 Oct 90	13:49:00	28.3	4.2	0.1	92.4	12.5
30 Oct 90	13:50:00	22.1	4.4	-0.0	92.4	12.4
30 Oct 90	13:51:00	20.1	4.5	-0.1	93.1	12.3
30 Oct 90	13:52:00	18.3	4.4	-0.1	93.1	12.4
30 Oct 90	13:53:00	16.8	4.5	-0.1	93.8	12.3
30 Oct 90	13:54:00	13.0	4.7	-0.1	92.8	12.1
30 Oct 90	13:55:00	13.3	4.8	-0.0	91.5	12.1
30 Oct 90	13:56:00	12.6	4.8	7.3	90.2	12.0
30 Oct 90	13:57:00	13.7	4.8	2.4	90.9	12.1
30 Oct 90	13:58:00	12.7	4.9	1.6	90.8	11.9
30 Oct 90	13:59:00	10.3	4.9	0.9	90.9	12.0
30 Oct 90	14:00:00	9.8	5.0	0.6	90.8	11.9
30 Oct 90	14:01:00	10.1	5.0	0.5	90.5	11.9
30 Oct 90	14:02:00	9.7	5.1	0.4	91.2	11.8
30 Oct 90	14:03:00	9.3	5.1	0.2	90.7	11.8
30 Oct 90	14:04:00	9.0	5.1	0.1	91.1	11.8
30 Oct 90	14:05:00	8.3	5.3	1.1	89.9	11.7
30 Oct 90	14:06:00	8.5	5.2	0.4	90.0	11.7
30 Oct 90	14:07:00	8.7	5.2	0.3	89.3	11.7
30 Oct 90	14:08:00	9.4	5.0	0.2	91.1	11.9
30 Oct 90	14:09:00	12.5	4.6	0.2	92.2	12.2
30 Oct 90	14:10:00	17.7	4.6	0.1	91.9	12.2
30 Oct 90	14:11:00	22.9	4.5	0.1	91.5	12.3
30 Oct 90	14:12:00	30.5	4.4	0.1	91.8	12.3
30 Oct 90	14:13:00	24.5	4.4	0.1	91.2	12.4
30 Oct 90	14:14:00	36.7	4.2	0.1	91.9	12.5
30 Oct 90	14:15:00	33.1	4.2	0.3	92.0	12.5
30 Oct 90	14:16:00	26.6	4.3	0.4	92.0	12.4
30 Oct 90	14:17:00	21.3	4.4	0.4	92.8	12.4
30 Oct 90	14:18:00	25.5	4.4	0.2	92.3	12.4
30 Oct 90	14:19:00	22.3	4.5	0.1	92.7	12.3
30 Oct 90	14:20:00	18.4	4.5	0.2	91.9	12.3
30 Oct 90	14:21:00	14.6	4.8	0.2	91.8	12.1
30 Oct 90	14:22:00	10.8	4.9	0.1	89.9	12.0
30 Oct 90	14:23:00	9.1	5.1	0.0	90.4	11.8

30 Oct 90	14:24:00	10.8	5.1	0.0	89.3	11.8
30 Oct 90	14:25:00	9.4	5.1	0.0	89.1	11.8
30 Oct 90	14:26:00	9.7	5.1	0.0	88.8	11.8
30 Oct 90	14:27:00	8.9	5.2	-0.0	89.5	11.7
30 Oct 90	14:28:00	13.1	4.7	0.5	90.0	12.2
30 Oct 90	14:29:00	14.4	4.8	2.0	90.8	12.1
30 Oct 90	14:30:00	11.1	4.9	1.1	90.3	12.0
	AVERAGE	14.6	4.8	0.3	91.1	12.1
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	0.0	0.1	0.0
	AVERAGE BIAS SPAN	255.5	5.8	23.3	238.0	5.0
	BIAS CORRECTED AVG	13.6	5.0	0.3	95.6	12.1

TEST T-2

23 OCTOBER 1990

TITLE: TEST TWO FUEL OIL
NOTE : OIL START UP

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
23 Oct 90	11:26:00	4.6	6.6	FID	101.1	10.7
23 Oct 90	11:27:00	5.0	6.6	FLAMED	99.1	10.7
23 Oct 90	11:28:00	4.9	6.9	OUT	97.0	10.5
23 Oct 90	11:29:00	4.1	6.7		100.6	10.7
23 Oct 90	11:30:00	4.2	6.8		97.7	10.6
23 Oct 90	11:31:00	5.2	6.6		97.2	10.7
23 Oct 90	11:32:00	5.2	6.6		98.1	10.8
23 Oct 90	11:33:00	6.0	6.5		99.4	10.8
23 Oct 90	11:34:00	6.0	6.5		98.2	10.8
23 Oct 90	11:35:00	6.2	6.5		99.2	10.8
23 Oct 90	11:36:00	6.0	6.5		99.2	10.8
23 Oct 90	11:37:00	6.2	6.6		98.5	10.7
23 Oct 90	11:38:00	6.2	6.7		98.8	10.7
23 Oct 90	11:39:00	6.2	6.4		100.9	10.8
23 Oct 90	11:40:00	6.0	6.5		100.2	10.8
23 Oct 90	11:41:00	6.2	6.5		101.0	10.8
23 Oct 90	11:42:00	6.2	6.5		99.6	10.8
23 Oct 90	11:43:00	6.2	6.7		99.2	10.7
23 Oct 90	11:44:00	6.2	6.6		101.5	10.8
23 Oct 90	11:45:00	6.1	6.5		101.8	10.9
23 Oct 90	11:46:00	6.1	6.4		102.5	10.9
23 Oct 90	11:47:00	6.2	6.5		98.7	10.8
23 Oct 90	11:48:00	6.0	6.5		99.6	10.8
23 Oct 90	11:49:00	6.0	6.5		101.0	10.9
23 Oct 90	11:50:00	6.0	6.4		102.9	11.0
23 Oct 90	11:51:00	6.2	6.5		101.1	10.8
23 Oct 90	11:52:00	6.2	6.5		100.9	10.9
23 Oct 90	11:53:00	6.0	6.5		101.4	10.9
23 Oct 90	11:54:00	6.2	6.5		100.0	10.9
23 Oct 90	11:55:00	6.2	6.6		97.3	10.8
23 Oct 90	11:56:00	6.1	6.6		98.7	10.8
23 Oct 90	11:57:00	5.5	6.5		100.5	10.9
23 Oct 90	11:58:00	5.4	6.5		101.8	10.9
23 Oct 90	11:59:00	5.2	6.7		98.7	10.8
23 Oct 90	12:00:00	5.2	6.6		101.1	10.9
23 Oct 90	12:01:00	5.2	6.5		101.4	10.9
23 Oct 90	12:02:00	5.2	6.5		100.4	10.9
23 Oct 90	12:03:00	5.2	6.7		97.9	10.8
23 Oct 90	12:04:00	5.2	6.5		101.7	10.9
23 Oct 90	12:05:00	5.2	6.5		100.3	10.9
23 Oct 90	12:06:00	5.2	6.7		98.2	10.8
23 Oct 90	12:07:00	5.2	6.6		100.8	10.9
23 Oct 90	12:08:00	5.2	6.6		100.7	10.9
23 Oct 90	12:09:00	5.2	6.6		101.0	10.9
23 Oct 90	12:10:00	5.2	6.6		100.7	10.9
23 Oct 90	12:11:00	5.2	6.6		100.8	10.9
23 Oct 90	12:12:00	5.2	6.6		100.9	10.9
23 Oct 90	12:13:00	5.2	6.7		98.1	10.7
23 Oct 90	12:14:00	5.2	6.6		101.2	10.9
23 Oct 90	12:15:00	5.2	6.5		102.7	10.9
23 Oct 90	12:16:00	5.2	6.6		101.9	10.9
23 Oct 90	12:17:00	5.2	6.5		101.2	10.9
23 Oct 90	12:18:00	5.2	6.7		100.0	10.8
23 Oct 90	12:19:00	5.8	6.6		100.5	10.8
23 Oct 90	12:20:00	6.1	6.6		101.4	10.8
23 Oct 90	12:21:00	5.5	6.5		103.2	10.9
23 Oct 90	12:22:00	5.2	6.5		101.7	10.9
23 Oct 90	12:23:00	5.2	6.6		102.4	10.8
23 Oct 90	12:24:00	5.2	6.6		101.7	10.8
23 Oct 90	12:25:00	5.2	6.6		101.2	10.8
23 Oct 90	12:26:00	5.2	6.6		98.9	10.8
23 Oct 90	12:27:00	5.2	6.6		97.8	10.8
23 Oct 90	12:28:00	5.2	6.6		101.1	10.8
23 Oct 90	12:29:00	5.2	6.6		101.3	10.8
23 Oct 90	12:30:00	5.2	6.6		100.3	10.8
23 Oct 90	12:31:00	5.2	6.6		99.5	10.8
23 Oct 90	12:32:00	5.2	6.6		100.4	10.8
23 Oct 90	12:33:00	4.8	6.6		100.4	10.8
23 Oct 90	12:34:00	5.2	6.6		100.6	10.8
23 Oct 90	12:35:00	5.0	6.6		100.7	10.8
23 Oct 90	12:36:00	5.2	6.7		97.9	10.7
23 Oct 90	12:37:00	5.2	6.6		100.9	10.8

23 Oct 90	12:38:00	4.8	6.6	102.1	10.9
23 Oct 90	12:39:00	5.1	6.6	100.9	10.9
23 Oct 90	12:40:00	4.7	6.7	99.5	10.8
23 Oct 90	12:41:00	5.2	6.7	99.6	10.8
23 Oct 90	12:42:00	5.0	6.6	100.9	10.9
23 Oct 90	12:43:00	5.0	6.5	100.1	10.9
23 Oct 90	12:44:00	5.0	6.6	100.1	10.9
23 Oct 90	12:45:00	5.2	6.6	100.9	10.9
23 Oct 90	12:46:00	5.2	6.6	100.9	10.9
23 Oct 90	12:47:00	5.0	6.6	100.2	10.9
23 Oct 90	12:48:00	5.0	6.6	100.3	10.9
23 Oct 90	12:49:00	5.2	6.6	99.7	10.8
23 Oct 90	12:50:00	5.0	6.7	98.0	10.8
23 Oct 90	12:51:00	5.0	6.6	100.7	10.9
23 Oct 90	12:52:00	5.2	6.4	103.3	11.0
23 Oct 90	12:53:00	5.3	6.5	101.3	10.9
23 Oct 90	12:54:00	5.3	6.6	101.1	10.9
23 Oct 90	12:55:00	4.4	6.6	100.2	10.8
23 Oct 90	12:56:00	4.1	6.7	99.6	10.8
23 Oct 90	12:57:00	4.1	6.6	100.7	10.9
23 Oct 90	12:58:00	4.3	6.5	101.4	10.9
23 Oct 90	12:59:00	4.2	6.4	102.9	11.0
23 Oct 90	13:00:00	5.3	6.4	102.7	11.0
23 Oct 90	13:01:00	5.3	6.5	102.6	11.0
23 Oct 90	13:02:00	5.3	6.4	102.6	11.0
23 Oct 90	13:03:00	5.4	6.4	103.2	11.0
23 Oct 90	13:04:00	5.7	6.6	101.2	10.9
23 Oct 90	13:05:00	5.6	6.5	102.0	10.9
23 Oct 90	13:06:00	5.5	6.4	102.5	11.0
23 Oct 90	13:07:00	5.6	6.4	102.5	11.0
23 Oct 90	13:08:00	5.7	6.4	102.5	11.0
23 Oct 90	13:09:00	5.8	6.4	103.7	11.1
23 Oct 90	13:10:00	5.5	6.4	103.4	11.0
23 Oct 90	13:11:00	5.5	6.5	103.4	11.0
23 Oct 90	13:12:00	5.5	6.5	102.5	11.0
23 Oct 90	13:13:00	6.0	6.5	103.4	11.0
23 Oct 90	13:14:00	5.3	6.5	103.6	11.0
23 Oct 90	13:15:00	5.5	6.5	103.0	11.0
23 Oct 90	13:16:00	25.8	6.5	102.0	11.0
23 Oct 90	13:17:00	51.5	6.3	100.9	11.1
23 Oct 90	13:18:00	54.1	6.5	98.9	11.0
23 Oct 90	13:19:00	46.5	6.3	103.4	11.1
23 Oct 90	13:20:00	32.4	6.4	103.2	11.1
23 Oct 90	13:21:00	29.1	6.4	102.0	11.0
23 Oct 90	13:22:00	25.3	6.3	103.2	11.1
23 Oct 90	13:23:00	27.2	6.3	105.2	11.1
23 Oct 90	13:24:00	22.0	6.4	103.3	11.0
23 Oct 90	13:25:00	15.3	6.3	103.0	11.0
23 Oct 90	13:26:00	13.5	6.2	104.5	11.2
23 Oct 90	13:27:00	5.8	6.6	100.8	10.8
23 Oct 90	13:28:00	5.2	6.4	102.8	11.0
23 Oct 90	13:29:00	5.2	6.3	104.1	11.1
23 Oct 90	13:30:00	5.2	6.3	103.1	11.1
23 Oct 90	13:31:00	5.4	6.3	104.1	11.0
23 Oct 90	13:32:00	5.2	6.3	103.1	11.1
23 Oct 90	13:33:00	5.0	6.2	104.8	11.2
23 Oct 90	13:34:00	5.4	6.2	103.1	11.1
23 Oct 90	13:35:00	5.1	6.3	102.5	11.1
23 Oct 90	13:36:00	5.3	6.3	103.0	11.1
23 Oct 90	13:37:00	5.2	6.3	103.3	11.1
23 Oct 90	13:38:00	5.4	6.3	103.2	11.1
23 Oct 90	13:39:00	5.2	6.2	104.0	11.1
23 Oct 90	13:40:00	5.3	6.4	103.5	11.0
23 Oct 90	13:41:00	5.8	6.3	103.0	11.0
23 Oct 90	13:42:00	5.2	6.3	104.8	11.1
23 Oct 90	13:43:00	5.5	6.2	105.3	11.2
23 Oct 90	13:44:00	5.2	6.3	104.4	11.1
23 Oct 90	13:45:00	5.2	6.3	104.1	11.0
23 Oct 90	13:46:00	5.2	6.2	105.2	11.1
23 Oct 90	13:47:00	5.2	6.2	106.1	11.2
23 Oct 90	13:48:00	5.7	6.2	105.5	11.1
23 Oct 90	13:49:00	5.2	6.4	103.0	10.9
23 Oct 90	13:50:00	5.2	6.3	104.5	11.0
23 Oct 90	13:51:00	5.2	6.3	103.4	11.1
23 Oct 90	13:52:00	5.2	6.2	105.9	11.2
23 Oct 90	13:53:00	5.4	6.3	103.5	11.1
23 Oct 90	13:54:00	5.2	6.4	103.3	10.9
23 Oct 90	13:55:00	5.2	6.3	104.1	11.0
23 Oct 90	13:56:00	5.2	6.2	105.4	11.1

23 Oct 90	13:57:00	5.2	6.4	102.9	10.9
23 Oct 90	13:58:00	5.2	6.4	103.8	11.0
23 Oct 90	13:59:00	5.0	6.3	103.5	11.1
23 Oct 90	14:00:00	5.2	6.3	104.3	11.1
23 Oct 90	14:01:00	4.6	6.3	105.5	11.0
23 Oct 90	14:02:00	4.9	6.1	108.0	11.3
23 Oct 90	14:03:00	5.2	6.3	104.4	11.0
23 Oct 90	14:04:00	5.2	6.4	102.5	11.0
23 Oct 90	14:05:00	5.2	6.3	104.1	11.0
23 Oct 90	14:06:00	5.2	6.2	104.9	11.1
23 Oct 90	14:07:00	5.2	6.2	104.2	11.1
23 Oct 90	14:08:00	5.2	6.4	103.3	11.0
23 Oct 90	14:09:00	5.2	6.2	105.0	11.1
23 Oct 90	14:10:00	5.2	6.2	104.5	11.1
23 Oct 90	14:11:00	5.2	6.2	103.8	11.1
23 Oct 90	14:12:00	5.5	6.2	105.5	11.1
23 Oct 90	14:13:00	5.2	6.3	103.6	11.0
23 Oct 90	14:14:00	5.6	6.4	103.8	11.0
23 Oct 90	14:15:00	5.3	6.3	104.9	11.0
23 Oct 90	14:16:00	5.9	6.2	104.9	11.1
23 Oct 90	14:17:00	5.7	6.3	103.6	11.0
23 Oct 90	14:18:00	5.2	6.3	103.5	11.0
23 Oct 90	14:19:00	5.2	6.3	104.1	11.0
23 Oct 90	14:20:00	5.2	6.1	105.4	11.2
23 Oct 90	14:21:00	5.2	6.2	104.7	11.1
23 Oct 90	14:22:00	5.2	6.3	103.3	11.0
23 Oct 90	14:23:00	5.2	6.4	102.8	10.9
23 Oct 90	14:24:00	5.2	6.3	104.1	11.0
23 Oct 90	14:25:00	5.2	6.2	104.5	11.1
23 Oct 90	14:26:00	5.2	6.1	105.4	11.1
23 Oct 90	14:27:00	5.2	6.1	107.6	11.2
23 Oct 90	14:28:00	5.2	6.3	104.5	11.0
23 Oct 90	14:29:00	5.2	6.2	104.4	11.1
23 Oct 90	14:30:00	5.2	6.2	105.8	11.1
23 Oct 90	14:31:00	5.2	6.2	105.7	11.1
23 Oct 90	14:32:00	5.2	6.4	102.7	11.0
23 Oct 90	14:33:00	5.2	6.3	103.4	11.0
23 Oct 90	14:34:00	5.2	6.3	103.9	11.0
23 Oct 90	14:35:00	5.2	6.3	104.0	11.0
23 Oct 90	14:36:00	5.2	6.2	104.8	11.1
23 Oct 90	14:37:00	5.2	6.2	104.3	11.1
23 Oct 90	14:38:00	5.3	6.2	103.7	11.1
23 Oct 90	14:39:00	5.6	6.3	104.6	11.0
23 Oct 90	14:40:00	5.2	6.2	105.1	11.1
23 Oct 90	14:41:00	5.2	6.2	105.0	11.1
23 Oct 90	14:42:00	5.2	6.3	103.8	11.0
23 Oct 90	14:43:00	5.2	6.2	105.8	11.1
23 Oct 90	14:44:00	5.2	6.2	104.8	11.1
23 Oct 90	14:45:00	5.2	6.2	103.6	11.1
23 Oct 90	14:46:00	4.9	6.2	103.9	11.1
23 Oct 90	14:47:00	4.9	6.2	104.2	11.1
23 Oct 90	14:48:00	4.6	6.3	104.2	11.0
23 Oct 90	14:49:00	5.1	6.2	105.4	11.1
23 Oct 90	14:50:00	5.6	6.2	105.1	11.1
23 Oct 90	14:51:00	5.6	6.5	103.4	10.8
23 Oct 90	14:52:00	5.2	6.3	104.8	11.0
23 Oct 90	14:53:00	5.2	6.3	104.4	11.0
23 Oct 90	14:54:00	5.2	6.4	104.1	10.9
23 Oct 90	14:55:00	5.2	6.2	106.0	11.1
23 Oct 90	14:56:00	5.1	6.5	102.7	10.9
23 Oct 90	14:57:00	4.4	6.3	104.0	11.0
23 Oct 90	14:58:00	4.9	6.3	102.2	11.0
23 Oct 90	14:59:00	4.1	6.2	105.0	11.1
	AVERAGE	6.6	6.4	102.3	11.0
	SPAN GAS VALUE	255.0	6.0	250.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	0.3	0.0
	AVERAGE BIAS SPAN	259.0	6.0	245.5	5.0
	BIAS CORRECTED AVG	5.6	6.4	104.0	11.0

TITLE: TEST TWO FUEL OIL
NOTE : SLURRY

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
23 Oct 90	15:30:00	18.4	2.7	0.3	128.2	13.9
23 Oct 90	15:31:00	18.1	2.6	0.2	128.9	13.9
23 Oct 90	15:32:00	21.5	2.5	0.2	128.6	14.0
23 Oct 90	15:33:00	20.9	2.6	0.1	128.1	13.9
23 Oct 90	15:34:00	16.0	2.7	0.1	129.4	13.9
23 Oct 90	15:35:00	20.7	2.5	0.1	129.7	14.0
23 Oct 90	15:36:00	21.4	2.5	6.9	129.0	14.0
23 Oct 90	15:37:00	24.3	2.5	3.1	131.0	14.0
23 Oct 90	15:38:00	22.4	2.6	3.0	129.7	14.0
23 Oct 90	15:39:00	21.9	2.5	3.0	128.7	14.0
23 Oct 90	15:40:00	22.0	2.7	1.5	127.9	13.9
23 Oct 90	15:41:00	14.3	2.9	1.1	127.8	13.7
23 Oct 90	15:42:00	12.7	2.9	0.8	130.7	13.7
23 Oct 90	15:43:00	14.5	2.8	0.7	129.6	13.8
23 Oct 90	15:44:00	15.2	2.8	0.5	130.5	13.8
23 Oct 90	15:45:00	11.2	3.0	0.3	134.1	13.7
23 Oct 90	15:46:00	14.6	3.0	0.2	132.1	13.7
23 Oct 90	15:47:00	9.3	3.1	1.5	132.2	13.6
23 Oct 90	15:48:00	14.4	2.9	0.6	133.7	13.8
23 Oct 90	15:49:00	9.9	3.3	0.3	131.1	13.4
23 Oct 90	15:50:00	12.6	2.7	0.4	131.3	13.9
23 Oct 90	15:51:00	20.1	2.7	0.3	128.7	13.8
23 Oct 90	15:52:00	30.3	2.3	0.3	128.9	14.1
23 Oct 90	15:53:00	23.9	2.7	0.3	128.5	13.9
23 Oct 90	15:54:00	23.5	2.4	10.2	129.4	14.1
23 Oct 90	15:55:00	26.8	2.5	1.9	129.8	14.1
23 Oct 90	15:56:00	31.1	2.3	1.1	129.9	14.1
23 Oct 90	15:57:00	32.2	2.4	0.8	131.5	14.1
23 Oct 90	15:58:00	29.3	2.4	-0.7	89.4	13.9
23 Oct 90	15:59:00	10.8	8.9	4.9	53.9	8.6
23 Oct 90	16:00:00	55.0	2.2	2.5	126.8	14.3
23 Oct 90	16:01:00	52.2	2.3	1.8	127.4	14.2
23 Oct 90	16:02:00	50.6	2.4	1.5	129.4	14.1
23 Oct 90	16:03:00	72.7	2.1	1.5	128.1	14.3
23 Oct 90	16:04:00	48.3	2.4	1.2	128.1	14.1
23 Oct 90	16:05:00	201.6	1.7	30.5	118.9	14.6
23 Oct 90	16:06:00	549.0	0.1	132.3	71.3	15.0
23 Oct 90	16:07:00	479.6	3.5	18.0	111.9	13.1
23 Oct 90	16:08:00	809.6	3.4	3.3	112.4	13.4
23 Oct 90	16:09:00	146.3	3.9	1.0	111.1	13.0
23 Oct 90	16:10:00	110.1	4.5	0.4	109.6	12.6
23 Oct 90	16:11:00	54.6	4.9	0.8	109.8	12.2
23 Oct 90	16:12:00	42.0	5.1	0.4	107.4	12.1
23 Oct 90	16:13:00	51.6	5.0	0.0	107.4	12.2
23 Oct 90	16:14:00	36.3	5.1	-0.1	108.2	12.1
23 Oct 90	16:15:00	37.4	5.2	-0.2	108.5	12.0
23 Oct 90	16:16:00	30.1	5.5	-0.2	109.8	11.8
23 Oct 90	16:17:00	34.1	5.1	-0.3	107.5	12.1
23 Oct 90	16:18:00	35.0	5.2	-0.3	109.5	12.1
23 Oct 90	16:19:00	37.0	5.2	-0.3	109.4	12.0
23 Oct 90	16:20:00	36.2	5.3	-0.4	108.2	11.9
23 Oct 90	16:21:00	36.4	5.0	-0.4	106.8	12.2
23 Oct 90	16:22:00	62.1	4.5	-0.4	102.1	12.6
23 Oct 90	16:23:00	81.3	4.6	0.4	101.7	12.6
23 Oct 90	16:24:00	58.6	4.9	0.3	102.1	12.3
23 Oct 90	16:25:00	42.8	4.9	-0.0	102.5	12.3
23 Oct 90	16:26:00	51.3	5.1	-0.1	103.8	12.2
23 Oct 90	16:27:00	40.9	5.2	0.4	104.9	12.1
23 Oct 90	16:28:00	36.2	5.1	3.1	105.3	12.1
23 Oct 90	16:29:00	44.7	5.0	1.1	106.1	12.2
23 Oct 90	16:30:00	35.2	5.2	0.5	108.8	12.0
23 Oct 90	16:31:00	38.9	5.1	0.2	105.4	12.2
23 Oct 90	16:32:00	38.2	5.0	0.1	104.3	12.3
23 Oct 90	16:33:00	128.1	4.7	-0.0	101.6	12.5
23 Oct 90	16:34:00	67.7	5.1	-0.1	102.9	12.1
23 Oct 90	16:35:00	45.2	5.2	-0.2	104.0	12.0
23 Oct 90	16:36:00	51.2	5.2	-0.2	104.4	12.0
23 Oct 90	16:37:00	40.6	5.2	-0.2	105.0	12.1
23 Oct 90	16:38:00	35.7	5.1	-0.3	105.4	12.1
23 Oct 90	16:39:00	33.0	5.4	-0.3	108.1	11.9
23 Oct 90	16:40:00	28.9	5.3	-0.4	107.2	12.0
23 Oct 90	16:41:00	28.3	5.4	0.3	108.8	11.8

23 Oct 90	16:42:00	32.1	5.3	-0.3	106.3	12.0
23 Oct 90	16:43:00	42.5	5.1	-0.4	106.3	12.1
23 Oct 90	16:44:00	31.3	5.2	-0.4	105.8	12.0
23 Oct 90	16:45:00	33.5	5.2	1.1	105.0	12.0
23 Oct 90	16:46:00	33.7	5.1	-0.3	106.3	12.1
23 Oct 90	16:47:00	31.7	5.2	-0.4	107.2	12.0
23 Oct 90	16:48:00	31.1	5.5	-0.4	107.8	11.8
23 Oct 90	16:49:00	29.0	6.0	-0.5	108.8	11.4
23 Oct 90	16:50:00	31.5	6.1	-0.5	107.3	11.3
23 Oct 90	16:51:00	32.3	6.1	-0.6	106.0	11.3
23 Oct 90	16:52:00	31.3	6.2	-0.7	106.1	11.2
23 Oct 90	16:53:00	30.9	6.0	-0.7	108.3	11.4
23 Oct 90	16:54:00	28.2	5.8	-0.7	107.0	11.5
23 Oct 90	16:55:00	30.8	5.9	5.8	103.5	11.5
23 Oct 90	16:56:00	31.6	6.1	4.2	103.4	11.3
BIAS CHECK						
23 Oct 90	17:07:00	44.3	6.3	-0.3	101.3	11.2
23 Oct 90	17:08:00	39.6	6.2	-0.4	102.9	11.2
23 Oct 90	17:09:00	37.0	6.2	-0.4	103.3	11.2
23 Oct 90	17:10:00	39.0	6.2	-0.2	105.3	11.3
23 Oct 90	17:11:00	39.4	6.1	-0.2	104.4	11.3
23 Oct 90	17:12:00	38.2	6.1	0.2	104.8	11.3
23 Oct 90	17:13:00	37.1	6.2	-0.5	104.9	11.3
23 Oct 90	17:14:00	36.3	6.2	-0.6	105.0	11.2
23 Oct 90	17:15:00	35.3	6.2	-0.5	104.1	11.2
23 Oct 90	17:16:00	37.2	6.2	-0.4	104.3	11.2
23 Oct 90	17:17:00	38.4	6.2	-0.4	102.6	11.2
23 Oct 90	17:18:00	37.4	6.2	-0.4	103.1	11.2
23 Oct 90	17:19:00	39.5	6.2	-0.4	103.1	11.2
23 Oct 90	17:20:00	37.1	6.2	-0.4	104.3	11.2
23 Oct 90	17:21:00	36.3	6.2	-0.5	102.9	11.2
23 Oct 90	17:22:00	35.2	6.0	-0.6	104.9	11.4
23 Oct 90	17:23:00	33.6	6.1	-0.6	105.1	11.3
23 Oct 90	17:24:00	36.2	6.1	-0.7	103.8	11.3
23 Oct 90	17:25:00	36.2	5.8	-0.6	103.3	11.6
23 Oct 90	17:26:00	47.0	5.5	-0.4	101.5	11.8
23 Oct 90	17:27:00	59.3	5.5	-0.4	100.7	11.7
23 Oct 90	17:28:00	58.5	5.7	-0.6	101.4	11.6
23 Oct 90	17:29:00	49.6	5.8	-0.6	100.8	11.6
23 Oct 90	17:30:00	63.1	5.6	-0.5	101.3	11.7
23 Oct 90	17:31:00	97.7	5.6	-0.5	102.2	11.7
23 Oct 90	17:32:00	45.5	5.6	-0.6	102.7	11.7
23 Oct 90	17:33:00	53.3	5.7	-0.0	103.1	11.6
23 Oct 90	17:34:00	53.6	5.7	-0.3	102.2	11.6
23 Oct 90	17:35:00	74.4	5.7	-0.5	100.4	11.6
23 Oct 90	17:36:00	115.8	5.7	-0.5	100.8	11.6
23 Oct 90	17:37:00	64.7	5.6	-0.6	100.9	11.7
23 Oct 90	17:38:00	56.7	5.7	-0.6	102.7	11.6
23 Oct 90	17:39:00	47.4	5.7	-0.6	102.5	11.6
23 Oct 90	17:40:00	39.6	5.8	-0.2	103.4	11.6
23 Oct 90	17:41:00	43.9	5.8	0.4	103.0	11.5
23 Oct 90	17:42:00	44.9	5.7	-0.3	103.3	11.6
23 Oct 90	17:43:00	45.8	5.7	-0.5	102.8	11.6
23 Oct 90	17:44:00	52.9	5.7	-0.7	103.5	11.6
23 Oct 90	17:45:00	42.6	5.7	-0.7	103.5	11.6
23 Oct 90	17:46:00	47.3	5.7	-0.7	103.9	11.6
23 Oct 90	17:47:00	45.9	5.7	0.7	103.1	11.6
23 Oct 90	17:48:00	43.4	5.8	-0.3	102.3	11.5
23 Oct 90	17:49:00	42.7	5.8	-0.4	101.0	11.5
23 Oct 90	17:50:00	41.7	5.7	-0.4	101.2	11.6
23 Oct 90	17:51:00	40.2	5.8	-0.5	102.6	11.5
23 Oct 90	17:52:00	36.1	5.8	-0.5	102.6	11.5
23 Oct 90	17:53:00	37.9	5.7	-0.5	102.6	11.6
23 Oct 90	17:54:00	38.9	5.7	-0.5	103.4	11.6
23 Oct 90	17:55:00	38.9	5.7	0.6	103.8	11.6
23 Oct 90	17:56:00	36.6	5.7	-0.3	104.2	11.6
23 Oct 90	17:57:00	37.1	5.7	-0.5	103.6	11.6
23 Oct 90	17:58:00	42.1	5.5	-0.4	101.4	11.7
23 Oct 90	17:59:00	52.7	5.6	-0.4	99.5	11.6
23 Oct 90	18:00:00	52.9	5.7	-0.4	100.2	11.6
23 Oct 90	18:01:00	45.2	5.7	-0.5	99.8	11.6
23 Oct 90	18:02:00	42.7	5.8	-0.5	101.5	11.5
23 Oct 90	18:03:00	53.1	5.6	-0.4	100.3	11.6
23 Oct 90	18:04:00	50.5	5.7	-0.4	102.1	11.6
23 Oct 90	18:05:00	51.6	5.7	-0.6	101.5	11.6
23 Oct 90	18:06:00	76.5	5.7	-0.5	100.9	11.6
23 Oct 90	18:07:00	58.0	5.8	-0.5	100.6	11.5
23 Oct 90	18:08:00	48.7	5.8	-0.6	101.6	11.5
23 Oct 90	18:09:00	45.4	5.8	-0.5	101.7	11.5

23 Oct 90	18:10:00	49.2	5.9	-0.5	101.1	11.4
23 Oct 90	18:11:00	45.1	5.9	-0.5	102.3	11.4
23 Oct 90	18:12:00	44.2	5.9	-0.5	101.9	11.4
23 Oct 90	18:13:00	53.8	5.8	-0.7	101.2	11.5
23 Oct 90	18:14:00	45.0	5.8	-0.7	102.6	11.5
23 Oct 90	18:15:00	38.5	5.8	-0.4	103.1	11.5
23 Oct 90	18:16:00	37.9	5.8	-0.7	102.6	11.5
23 Oct 90	18:17:00	40.6	5.7	-0.7	103.2	11.5
23 Oct 90	18:18:00	45.1	5.9	-0.6	102.4	11.4
23 Oct 90	18:19:00	43.4	5.9	-0.6	102.4	11.4
23 Oct 90	18:20:00	40.0	5.8	-0.6	102.3	11.4
23 Oct 90	18:21:00	37.7	5.8	-0.7	101.8	11.5
23 Oct 90	18:22:00	35.9	5.8	-0.8	103.2	11.5
23 Oct 90	18:23:00	34.5	5.8	-0.7	103.2	11.5
23 Oct 90	18:24:00	37.7	5.8	-0.7	103.4	11.5
23 Oct 90	18:25:00	37.6	5.9	-0.8	103.6	11.4
23 Oct 90	18:26:00	36.8	5.8	-0.8	103.1	11.5
23 Oct 90	18:27:00	37.3	5.7	-0.9	103.4	11.6
23 Oct 90	18:28:00	36.6	5.9	-0.9	102.8	11.4
23 Oct 90	18:29:00	39.5	5.9	-0.8	104.1	11.4
23 Oct 90	18:30:00	37.9	6.1	-0.7	102.6	11.2
23 Oct 90	18:31:00	39.0	6.2	-0.7	100.0	11.1
23 Oct 90	18:32:00	46.0	6.2	-0.3	98.2	11.1
23 Oct 90	18:33:00	40.2	6.3	-0.7	98.0	11.0
23 Oct 90	18:34:00	43.1	6.4	-0.7	98.8	11.0
23 Oct 90	18:35:00	41.5	6.4	-0.8	100.0	11.0
23 Oct 90	18:36:00	43.1	6.4	-0.3	99.2	11.0
23 Oct 90	18:37:00	42.3	6.3	-0.7	98.3	11.1
23 Oct 90	18:38:00	41.4	6.3	-0.7	97.8	11.0
23 Oct 90	18:39:00	43.9	6.3	-0.6	96.7	11.1
BIAS CHECK						
23 Oct 90	18:51:00	41.5	6.5	-0.8	102.9	10.9
23 Oct 90	18:52:00	43.0	6.5	-0.7	102.5	10.9
23 Oct 90	18:53:00	43.0	6.5	-0.6	103.4	11.0
23 Oct 90	18:54:00	38.8	6.4	-0.6	103.7	11.0
23 Oct 90	18:55:00	39.4	6.5	-0.4	104.6	11.0
23 Oct 90	18:56:00	40.9	6.3	-0.5	104.8	11.1
23 Oct 90	18:57:00	38.7	6.3	-0.6	105.6	11.1
23 Oct 90	18:58:00	38.9	6.3	-0.6	106.3	11.1
23 Oct 90	18:59:00	39.3	6.4	-0.7	105.6	11.0
23 Oct 90	19:00:00	39.8	6.4	-0.7	103.6	11.0
	AVERAGE	50.9	5.1	1.0	107.8	12.0
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	2.1	0.0	-1.9	0.0	0.0
	AVERAGE BIAS SPAN	254.5	6.0	22.8	242.5	5.1
	BIAS CORRECTED AVG	49.3	5.1	3.0	111.2	11.8

TITLE: TEST TWO FUEL OIL
NOTE : ACETONE

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
23 Oct 90	20:47:00	149.2	0.3	132.8	67.5	11.3
23 Oct 90	20:48:00	1.6	2.6	44.0	117.8	12.6
23 Oct 90	20:49:00	320.3	6.2	0.7	115.2	11.1
23 Oct 90	20:50:00	18.5	6.3	-0.4	114.1	11.0
23 Oct 90	20:51:00	9.7	6.4	-0.7	115.6	11.1
23 Oct 90	20:52:00	8.2	6.1	-0.9	113.7	11.4
23 Oct 90	20:53:00	57.8	3.8	-0.5	115.1	13.4
23 Oct 90	20:54:00	574.0	2.0	-0.4	111.7	14.7
23 Oct 90	20:55:00	298.0	4.0	-0.8	103.1	13.1
23 Oct 90	20:56:00	16.1	5.6	-1.0	90.8	11.9
23 Oct 90	20:57:00	8.9	6.0	-1.1	88.4	11.6
23 Oct 90	20:58:00	17.4	4.5	-1.0	94.8	12.9
23 Oct 90	20:59:00	74.9	3.5	-1.0	94.1	13.7
23 Oct 90	21:00:00	46.8	5.0	-1.2	84.9	12.5
23 Oct 90	21:01:00	12.5	5.5	-1.3	83.9	12.2
23 Oct 90	21:02:00	18.9	4.7	-1.2	86.6	12.9
23 Oct 90	21:03:00	38.2	4.2	-1.1	86.6	13.3
23 Oct 90	21:04:00	114.2	3.4	-0.9	87.1	13.9
23 Oct 90	21:05:00	190.1	3.5	-1.0	87.8	13.8
23 Oct 90	21:06:00	69.1	3.8	3.0	86.7	13.5
23 Oct 90	21:07:00	49.8	4.1	3.0	87.0	13.3
23 Oct 90	21:08:00	42.3	4.3	0.4	85.6	13.2
23 Oct 90	21:09:00	44.2	4.1	0.0	85.2	13.3
23 Oct 90	21:10:00	46.5	4.2	-0.3	85.7	13.2
23 Oct 90	21:11:00	42.2	4.2	-0.6	85.2	13.3
23 Oct 90	21:12:00	45.8	4.1	-0.8	85.8	13.3
23 Oct 90	21:13:00	42.3	4.0	-0.9	86.2	13.4
23 Oct 90	21:14:00	45.2	4.2	-1.0	86.4	13.2
23 Oct 90	21:15:00	35.0	4.3	-1.0	85.8	13.2
23 Oct 90	21:16:00	35.5	4.4	-1.0	85.7	13.1
23 Oct 90	21:17:00	28.7	4.7	-1.0	84.8	12.9
23 Oct 90	21:18:00	16.9	5.6	-0.4	81.6	12.0
23 Oct 90	21:19:00	13.9	5.3	-1.0	82.9	12.4
23 Oct 90	21:20:00	83.7	3.9	-0.9	86.3	13.5
23 Oct 90	21:21:00	54.1	4.8	-1.1	85.1	12.8
23 Oct 90	21:22:00	15.1	5.5	-1.1	82.6	12.2
23 Oct 90	21:23:00	21.4	4.8	-1.1	85.3	12.7
23 Oct 90	21:24:00	31.8	5.0	-1.1	83.8	12.6
23 Oct 90	21:25:00	15.6	5.5	-1.2	81.5	12.2
23 Oct 90	21:26:00	13.2	5.5	-1.3	83.7	12.2
23 Oct 90	21:27:00	21.3	5.1	-1.0	85.3	12.5
23 Oct 90	21:28:00	19.8	5.1	-1.1	84.8	12.5
23 Oct 90	21:29:00	21.1	5.2	-1.2	84.2	12.5
23 Oct 90	21:30:00	17.4	5.2	-1.2	84.7	12.5
23 Oct 90	21:31:00	29.7	5.0	-1.3	83.3	12.5
23 Oct 90	21:32:00	13.8	5.8	-1.3	82.0	11.9
23 Oct 90	21:33:00	14.4	7.0	20.4	71.6	10.9
FLAMEOUT						
23 Oct 90	22:06:00	23.9	5.4	1.0	82.1	12.4
23 Oct 90	22:07:00	15.1	5.3	0.5	81.9	12.5
23 Oct 90	22:08:00	25.4	4.6	0.2	83.7	13.1
23 Oct 90	22:09:00	32.2	4.5	0.0	82.2	13.1
23 Oct 90	22:10:00	35.1	4.5	-0.1	82.7	13.2
23 Oct 90	22:11:00	35.6	4.4	-0.1	81.8	13.2
23 Oct 90	22:12:00	31.7	4.6	-0.2	82.9	13.0
23 Oct 90	22:13:00	29.6	4.5	-0.2	82.4	13.1
23 Oct 90	22:14:00	33.9	4.6	-0.3	82.6	13.0
23 Oct 90	22:15:00	29.4	4.6	-0.3	82.3	13.0
23 Oct 90	22:16:00	23.9	4.8	-0.4	82.0	12.9
23 Oct 90	22:17:00	20.4	5.0	-0.6	81.4	12.7
23 Oct 90	22:18:00	23.6	4.9	-0.6	81.4	12.8
23 Oct 90	22:19:00	18.9	5.1	-0.7	82.5	12.6
23 Oct 90	22:20:00	21.1	4.9	-0.7	82.5	12.7
23 Oct 90	22:21:00	21.7	5.0	-0.7	82.3	12.7
23 Oct 90	22:22:00	20.5	5.0	-0.9	82.6	12.7
23 Oct 90	22:23:00	20.1	5.0	-0.8	82.1	12.6
23 Oct 90	22:24:00	19.4	5.0	-0.8	82.2	12.7
23 Oct 90	22:25:00	17.8	5.3	-0.7	80.7	12.4
23 Oct 90	22:26:00	16.5	5.3	-0.7	79.9	12.5
23 Oct 90	22:27:00	13.8	5.8	-0.2	78.1	12.0
23 Oct 90	22:28:00	10.9	6.0	-0.8	78.6	11.8
23 Oct 90	22:29:00	10.0	6.0	-0.8	78.2	11.9

23 Oct 90	22:30:00	10.4	6.1	-0.9	77.8	11.7
23 Oct 90	22:31:00	10.9	6.2	0.1	78.1	11.7
23 Oct 90	22:32:00	10.4	6.4	1.7	76.9	11.5
23 Oct 90	22:33:00	9.4	6.7	0.0	75.8	11.2
23 Oct 90	22:34:00	9.4	6.8	-0.4	75.6	11.1
23 Oct 90	22:35:00	9.5	7.0	-0.6	75.0	10.9
23 Oct 90	22:36:00	10.8	7.2	-0.8	73.1	10.8
23 Oct 90	22:37:00	12.1	7.1	-0.9	73.5	10.9
23 Oct 90	22:38:00	12.1	7.0	-1.0	74.0	10.9
23 Oct 90	22:39:00	11.4	6.1	-1.0	77.7	11.8
23 Oct 90	22:40:00	13.7	5.7	-1.0	77.7	12.1
FLAMEOUT						
23 Oct 90	22:49:00	61.5	6.4	4.9	80.8	11.7
23 Oct 90	22:50:00	56.9	3.6	3.1	87.1	13.8
23 Oct 90	22:51:00	52.8	3.5	1.9	87.0	13.9
23 Oct 90	22:52:00	67.3	3.5	1.2	86.2	13.8
23 Oct 90	22:53:00	64.7	3.8	0.8	87.4	13.7
23 Oct 90	22:54:00	60.0	3.7	0.6	87.1	13.7
23 Oct 90	22:55:00	58.5	3.8	0.4	85.7	13.6
23 Oct 90	22:56:00	70.1	3.8	0.3	86.2	13.7
23 Oct 90	22:57:00	60.0	3.9	0.2	86.3	13.6
23 Oct 90	22:58:00	55.8	4.1	0.0	86.2	13.4
23 Oct 90	22:59:00	41.4	4.3	-0.2	85.5	13.2
23 Oct 90	23:00:00	38.0	4.5	-0.3	85.3	13.0
23 Oct 90	23:01:00	25.2	5.2	-0.3	84.1	12.4
23 Oct 90	23:02:00	11.9	6.2	-0.5	79.6	11.6
23 Oct 90	23:03:00	10.0	6.5	-0.6	78.7	11.3
23 Oct 90	23:04:00	9.7	6.8	-0.7	77.7	11.1
23 Oct 90	23:05:00	8.5	6.5	-0.8	79.6	11.4
23 Oct 90	23:06:00	9.2	6.2	-0.9	79.9	11.6
23 Oct 90	23:07:00	9.2	6.3	-0.9	79.5	11.5
23 Oct 90	23:08:00	10.2	6.4	-0.8	78.9	11.4
23 Oct 90	23:09:00	10.6	5.8	-0.8	81.4	12.0
23 Oct 90	23:10:00	16.1	5.3	-0.7	82.8	12.4
23 Oct 90	23:11:00	19.4	5.0	-0.4	83.8	12.7
23 Oct 90	23:12:00	27.6	4.6	-0.5	84.6	13.0
23 Oct 90	23:13:00	42.4	4.2	-0.7	85.9	13.3
23 Oct 90	23:14:00	47.6	4.2	-0.7	84.7	13.3
23 Oct 90	23:15:00	44.6	4.4	-0.7	85.9	13.1
23 Oct 90	23:16:00	23.9	5.0	-0.7	83.8	12.7
23 Oct 90	23:17:00	22.7	5.1	27.3	81.3	12.6
STOPPED BURN DUE TO EARTHQUAKE (5.7 RICKTER SCALE)						
	AVERAGE	41.5	5.0	1.6	85.0	12.5
SPAN GAS VALUE		255.0	6.0	25.0	250.0	5.0
AVERAGE BIAS ZERO		0.0	0.0	-1.7	0.0	0.0
AVERAGE BIAS SPAN		251.5	6.0	22.1	245.5	5.1
BIAS CORRECTED AVG		42.1	5.0	3.5	86.6	12.3
24 Oct 90	10:12:00	348.4	1.6	56.9	77.5	14.2
24 Oct 90	10:13:00	650.7	1.5	88.4	74.8	14.3
24 Oct 90	10:14:00	521.1	1.2	131.5	70.4	14.3
24 Oct 90	10:15:00	171.9	0.8	87.2	71.0	14.2
24 Oct 90	10:16:00	491.4	2.4	29.0	75.2	13.7
24 Oct 90	10:17:00	727.8	0.7	127.5	70.5	14.5
24 Oct 90	10:18:00	520.4	0.3	114.1	70.0	14.7
24 Oct 90	10:19:00	343.0	3.3	18.8	72.5	13.0
24 Oct 90	10:20:00	50.1	3.7	15.0	72.0	12.8
24 Oct 90	10:21:00	43.0	3.8	13.6	71.1	12.7
24 Oct 90	10:22:00	548.0	1.9	105.4	72.2	14.0
24 Oct 90	10:23:00	391.7	0.5	113.3	70.7	14.9
24 Oct 90	10:24:00	194.9	0.6	115.4	70.9	14.8
24 Oct 90	10:25:00	508.4	0.8	47.8	75.3	14.8
24 Oct 90	10:26:00	1052.6	1.0	36.1	76.2	14.7
24 Oct 90	10:27:00	1052.6	0.9	35.4	77.6	14.7
24 Oct 90	10:28:00	1052.6	1.4	16.1	78.6	14.4
24 Oct 90	10:29:00	467.3	3.9	7.2	74.5	12.6
24 Oct 90	10:30:00	61.9	3.2	6.9	73.2	13.1
24 Oct 90	10:31:00	50.4	3.5	6.5	72.9	13.0
24 Oct 90	10:32:00	57.8	3.4	6.1	74.8	13.1
24 Oct 90	10:33:00	52.8	3.3	5.7	74.9	13.1
24 Oct 90	10:34:00	57.5	3.3	5.5	75.7	13.1
24 Oct 90	10:35:00	58.6	3.2	5.4	75.5	13.2
24 Oct 90	10:36:00	120.7	2.8	5.0	77.7	13.5
24 Oct 90	10:37:00	124.0	2.8	4.8	77.2	13.5
24 Oct 90	10:38:00	148.5	2.6	4.6	76.7	13.6
24 Oct 90	10:39:00	135.8	2.7	5.2	77.5	13.6
24 Oct 90	10:40:00	133.1	2.7	7.4	78.1	13.6
24 Oct 90	10:41:00	122.7	2.8	4.4	77.9	13.5

24 Oct 90	10:42:00	127.6	2.7	4.0	77.5	13.5
24 Oct 90	10:43:00	118.5	2.8	3.9	77.8	13.5
24 Oct 90	10:44:00	104.7	2.9	3.8	77.6	13.5
24 Oct 90	10:45:00	110.3	2.9	3.8	77.2	13.4
24 Oct 90	10:46:00	102.1	3.0	4.2	77.2	13.4
24 Oct 90	10:47:00	96.9	3.0	4.7	77.3	13.4
24 Oct 90	10:48:00	81.9	3.1	3.8	77.0	13.3
24 Oct 90	10:49:00	79.7	3.2	3.6	77.4	13.3
24 Oct 90	10:50:00	67.0	3.3	3.3	76.9	13.1
24 Oct 90	10:51:00	53.0	3.5	3.3	76.2	13.0
24 Oct 90	10:52:00	44.3	3.7	3.1	77.4	12.9
24 Oct 90	10:53:00	38.8	3.7	2.9	78.9	12.9
24 Oct 90	10:54:00	55.3	3.5	3.6	80.9	13.0
24 Oct 90	10:55:00	56.5	3.6	9.2	81.2	12.9
24 Oct 90	10:56:00	47.2	3.7	6.4	81.1	12.8
24 Oct 90	10:57:00	37.7	3.9	5.0	79.3	12.7
24 Oct 90	10:58:00	36.9	3.8	4.2	79.4	12.8
24 Oct 90	10:59:00	33.6	3.7	4.2	79.7	12.8
24 Oct 90	11:00:00	52.7	3.7	3.4	79.4	12.8
24 Oct 90	11:01:00	50.7	3.2	3.2	80.6	13.2
24 Oct 90	11:02:00	45.9	3.6	2.9	80.0	12.9
24 Oct 90	11:03:00	59.2	3.2	2.7	82.2	13.2
24 Oct 90	11:04:00	46.2	3.7	3.0	80.5	12.8
24 Oct 90	11:05:00	41.1	3.6	2.6	81.0	12.9
24 Oct 90	11:06:00	44.6	3.6	2.4	80.8	12.9
24 Oct 90	11:07:00	34.1	3.8	2.4	80.0	12.7
24 Oct 90	11:08:00	49.1	3.3	2.5	80.5	13.1
24 Oct 90	11:09:00	52.2	3.4	2.5	81.2	13.0
24 Oct 90	11:10:00	48.3	3.5	2.5	80.9	13.0
24 Oct 90	11:11:00	50.1	3.4	2.5	80.9	13.0
24 Oct 90	11:12:00	64.5	3.4	2.4	80.7	13.0
24 Oct 90	11:12:00	63.7	3.4	2.3	80.8	13.0
24 Oct 90	11:14:00	66.8	3.4	2.4	80.7	13.1
24 Oct 90	11:15:00	55.0	3.4	2.3	80.7	13.0
24 Oct 90	11:16:00	73.4	3.3	2.3	81.3	13.1
24 Oct 90	11:17:00	50.4	3.4	2.2	81.3	13.0
24 Oct 90	11:18:00	50.1	3.5	2.1	81.2	13.0
24 Oct 90	11:19:00	45.8	3.5	2.5	80.9	13.0
24 Oct 90	11:20:00	63.6	3.4	2.2	81.1	13.1
24 Oct 90	11:21:00	81.3	3.4	2.2	80.6	13.0
24 Oct 90	11:22:00	59.4	3.4	2.1	80.8	13.1
24 Oct 90	11:23:00	56.9	3.3	2.1	81.5	13.1
24 Oct 90	11:24:00	72.8	3.3	2.0	81.2	13.2
24 Oct 90	11:25:00	61.5	3.3	2.2	81.0	13.1
24 Oct 90	11:26:00	53.8	3.3	2.3	81.9	13.2
24 Oct 90	11:27:00	64.1	3.3	2.2	81.4	13.2
24 Oct 90	11:28:00	63.4	3.3	2.1	82.3	13.1
24 Oct 90	11:29:00	56.8	3.4	2.2	82.1	13.1
24 Oct 90	11:30:00	58.3	3.5	2.2	82.5	13.0
24 Oct 90	11:31:00	50.6	3.5	2.1	82.0	13.0
24 Oct 90	11:32:00	60.0	3.5	2.1	80.8	13.0
24 Oct 90	11:33:00	65.7	3.4	2.0	81.5	13.0
24 Oct 90	11:34:00	50.0	3.6	1.9	80.3	12.9
24 Oct 90	11:35:00	41.5	3.6	1.8	81.2	12.9
24 Oct 90	11:36:00	45.6	3.6	1.8	81.6	12.9
24 Oct 90	11:37:00	52.2	3.6	1.7	82.9	13.0
24 Oct 90	11:38:00	46.3	3.6	1.7	81.9	12.9
24 Oct 90	11:39:00	46.0	3.6	1.7	81.8	12.9
24 Oct 90	11:40:00	46.0	3.7	1.7	81.5	12.9
24 Oct 90	11:41:00	37.4	3.9	1.7	81.6	12.7
24 Oct 90	11:42:00	37.1	3.8	1.7	81.3	12.8
24 Oct 90	11:43:00	40.4	3.6	1.7	79.9	12.9
24 Oct 90	11:44:00	40.8	3.6	1.7	80.9	13.0
24 Oct 90	11:45:00	43.1	3.6	1.8	80.7	13.0
24 Oct 90	11:46:00	58.2	3.4	1.9	80.4	13.1
24 Oct 90	11:47:00	61.1	3.5	1.9	80.7	13.0
24 Oct 90	11:48:00	45.3	3.5	1.9	81.1	13.0
24 Oct 90	11:49:00	48.9	3.5	1.9	80.2	13.0
24 Oct 90	11:50:00	31.0	3.6	2.3	80.4	12.9
24 Oct 90	11:51:00	33.0	3.6	2.7	80.7	12.9
24 Oct 90	11:52:00	32.4	3.7	2.2	81.2	12.9
24 Oct 90	11:53:00	30.3	3.7	1.9	80.6	12.8
24 Oct 90	11:54:00	30.3	3.7	1.8	82.5	12.8
24 Oct 90	11:55:00	27.4	3.7	16.9	81.6	12.8
24 Oct 90	11:56:00	562.9	1.1	34.4	80.2	14.6
24 Oct 90	11:57:00	1052.5	1.1	26.9	79.5	14.7
24 Oct 90	11:58:00	1052.6	1.6	15.9	78.5	14.3
24 Oct 90	11:59:00	312.9	3.9	2.0	77.4	12.7
24 Oct 90	12:00:00	46.9	3.8	1.9	80.4	12.8

24 Oct 90	12:01:00	58.7	3.6	1.9	82.1	12.9
24 Oct 90	12:02:00	52.4	3.6	1.9	82.2	12.9
24 Oct 90	12:03:00	59.2	3.6	1.8	82.5	12.9
24 Oct 90	12:04:00	49.3	3.8	1.8	82.3	12.8
24 Oct 90	12:05:00	40.2	3.8	1.7	82.0	12.8
24 Oct 90	12:06:00	45.4	3.7	2.3	82.0	12.8
24 Oct 90	12:07:00	49.9	3.7	2.1	81.2	12.9
24 Oct 90	12:08:00	48.3	3.7	1.9	82.3	12.8
24 Oct 90	12:09:00	62.5	3.5	1.8	81.6	13.0
24 Oct 90	12:10:00	49.3	3.6	1.7	81.2	12.9
24 Oct 90	12:11:00	39.7	3.6	1.6	81.6	12.9
24 Oct 90	12:12:00	38.6	3.6	1.5	82.1	12.9
24 Oct 90	12:13:00	34.5	3.7	2.6	81.5	12.8
24 Oct 90	12:14:00	33.8	3.7	1.9	81.1	12.8
24 Oct 90	12:15:00	33.8	3.6	1.6	81.8	12.9
24 Oct 90	12:16:00	36.2	3.6	1.6	81.6	12.9
24 Oct 90	12:17:00	32.3	3.6	1.5	81.5	12.9
24 Oct 90	12:18:00	32.9	3.7	1.5	81.3	12.9
24 Oct 90	12:19:00	31.0	3.7	1.5	81.4	12.8
24 Oct 90	12:20:00	27.4	3.8	1.6	82.2	12.7
24 Oct 90	12:21:00	33.4	3.8	1.5	81.0	12.7
24 Oct 90	12:22:00	24.0	3.9	1.5	83.6	12.7
24 Oct 90	12:23:00	24.7	3.8	1.5	82.7	12.7
24 Oct 90	12:24:00	31.9	3.7	3.1	81.6	12.8
24 Oct 90	12:25:00	36.4	3.5	3.8	82.0	13.0
24 Oct 90	12:26:00	37.9	3.5	2.7	82.5	12.9
24 Oct 90	12:27:00	41.5	3.5	2.1	82.2	13.0
24 Oct 90	12:28:00	39.7	3.6	1.8	83.0	12.9
24 Oct 90	12:29:00	38.1	3.6	1.6	82.7	12.9
24 Oct 90	12:30:00	38.7	3.7	1.5	82.8	12.9
24 Oct 90	12:31:00	35.7	3.7	1.4	81.7	12.8
24 Oct 90	12:32:00	33.3	3.8	2.6	82.1	12.8
24 Oct 90	12:33:00	35.2	3.7	1.8	82.2	12.8
24 Oct 90	12:34:00	35.2	3.6	1.6	82.2	12.9
24 Oct 90	12:35:00	36.0	3.7	1.6	82.0	12.9
24 Oct 90	12:36:00	40.6	3.7	1.6	82.9	12.8
24 Oct 90	12:37:00	44.5	3.6	1.5	83.1	12.9
24 Oct 90	12:38:00	34.5	3.6	1.4	84.1	12.9
24 Oct 90	12:39:00	31.6	3.8	1.4	84.2	12.8
24 Oct 90	12:40:00	31.4	3.7	1.3	83.9	12.8
24 Oct 90	12:41:00	28.6	3.8	1.4	82.4	12.7
24 Oct 90	12:42:00	27.5	3.9	1.5	82.7	12.7
24 Oct 90	12:43:00	22.2	4.1	1.7	83.5	12.5
24 Oct 90	12:44:00	21.2	4.0	1.4	82.9	12.6
24 Oct 90	12:45:00	20.0	4.2	1.4	82.7	12.5
24 Oct 90	12:46:00	19.8	4.1	1.4	83.7	12.5
24 Oct 90	12:47:00	20.1	4.1	1.4	83.4	12.5
24 Oct 90	12:48:00	17.7	4.2	1.4	84.1	12.4
24 Oct 90	12:49:00	15.8	4.4	1.3	83.9	12.3
24 Oct 90	12:50:00	15.3	4.4	1.3	84.0	12.3
24 Oct 90	12:51:00	15.3	4.4	1.3	86.0	12.3
24 Oct 90	12:52:00	16.0	4.4	1.2	86.2	12.3
24 Oct 90	12:53:00	18.1	4.1	1.5	84.3	12.5
24 Oct 90	12:54:00	18.2	5.2	2.9	82.7	11.6
24 Oct 90	12:55:00	6.4	5.3	2.9	96.9	11.5
24 Oct 90	12:56:00	7.6	5.4	1.8	92.5	11.4
24 Oct 90	12:57:00	6.9	5.3	1.5	93.7	11.5
24 Oct 90	12:58:00	6.4	5.3	1.3	94.1	11.5
24 Oct 90	12:59:00	13.2	5.1	36.4	90.6	11.7
	AVERAGE	114.8	3.4	9.9	80.4	13.0
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	0.8	0.0	0.2	0.2	0.0
	AVERAGE BIAS SPAN	251.0	5.9	24.9	238.5	4.9
	BIAS CORRECTED AVG	116.2	3.4	9.8	84.1	13.3

AVERAGE OF BOTH ACETONE RUNS

79.2	4.2	6.7	85.4	12.8

TITLE: TEST FUEL OIL
NOTE : START PARTICULATE RUN NUMBER TWO AT 1726

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
23 Oct 90	17:26:00	47.0	5.5	-0.4	101.5	11.8
23 Oct 90	17:27:00	59.3	5.5	-0.4	100.7	11.7
23 Oct 90	17:28:00	58.5	5.7	-0.6	101.4	11.6
23 Oct 90	17:29:00	49.6	5.8	-0.6	100.8	11.6
23 Oct 90	17:30:00	63.1	5.6	-0.5	101.3	11.7
23 Oct 90	17:31:00	97.7	5.6	-0.5	102.2	11.7
23 Oct 90	17:32:00	45.5	5.6	-0.6	102.7	11.7
23 Oct 90	17:33:00	53.3	5.7	-0.0	103.1	11.6
23 Oct 90	17:34:00	53.6	5.7	-0.3	102.2	11.6
23 Oct 90	17:35:00	74.4	5.7	-0.5	100.4	11.6
23 Oct 90	17:36:00	115.8	5.7	-0.5	100.8	11.6
23 Oct 90	17:37:00	64.7	5.6	-0.6	100.9	11.7
23 Oct 90	17:38:00	56.7	5.7	-0.6	102.7	11.6
23 Oct 90	17:39:00	47.4	5.7	-0.6	102.5	11.6
23 Oct 90	17:40:00	39.6	5.8	-0.2	103.4	11.6
23 Oct 90	17:41:00	43.9	5.8	0.4	103.0	11.5
23 Oct 90	17:42:00	44.9	5.7	-0.3	103.3	11.6
23 Oct 90	17:43:00	45.8	5.7	-0.5	102.8	11.6
23 Oct 90	17:44:00	52.9	5.7	-0.7	103.5	11.6
23 Oct 90	17:45:00	42.6	5.7	-0.7	103.5	11.6
23 Oct 90	17:46:00	47.3	5.7	-0.7	103.9	11.6
23 Oct 90	17:47:00	45.9	5.7	0.7	103.1	11.6
23 Oct 90	17:48:00	43.4	5.8	-0.3	102.3	11.5
23 Oct 90	17:49:00	42.7	5.8	-0.4	101.0	11.5
23 Oct 90	17:50:00	41.7	5.7	-0.4	101.2	11.6
23 Oct 90	17:51:00	40.2	5.8	-0.5	102.6	11.5
23 Oct 90	17:52:00	36.1	5.8	-0.5	102.6	11.5
23 Oct 90	17:53:00	37.9	5.7	-0.5	102.6	11.6
23 Oct 90	17:54:00	38.9	5.7	-0.5	103.4	11.6
23 Oct 90	17:55:00	38.9	5.7	0.6	103.8	11.6
23 Oct 90	17:56:00	36.6	5.7	-0.3	104.2	11.6
23 Oct 90	17:57:00	37.1	5.7	-0.5	103.6	11.6
23 Oct 90	17:58:00	42.1	5.5	-0.4	101.4	11.7
23 Oct 90	17:59:00	52.7	5.6	-0.4	99.5	11.6
23 Oct 90	18:00:00	52.9	5.7	-0.4	100.2	11.6
23 Oct 90	18:01:00	45.2	5.7	-0.5	99.8	11.6
23 Oct 90	18:02:00	42.7	5.8	-0.5	101.5	11.5
23 Oct 90	18:03:00	53.1	5.6	-0.4	100.3	11.6
23 Oct 90	18:04:00	50.5	5.7	-0.4	102.1	11.6
23 Oct 90	18:05:00	51.6	5.7	-0.6	101.5	11.6
23 Oct 90	18:06:00	76.5	5.7	-0.5	100.9	11.6
23 Oct 90	18:07:00	58.0	5.8	-0.5	100.6	11.5
23 Oct 90	18:08:00	48.7	5.8	-0.6	101.6	11.5
23 Oct 90	18:09:00	45.4	5.8	-0.5	101.7	11.5
23 Oct 90	18:10:00	49.2	5.9	-0.5	101.1	11.4
23 Oct 90	18:11:00	45.1	5.9	-0.5	102.3	11.4
23 Oct 90	18:12:00	44.2	5.9	-0.5	101.9	11.4
23 Oct 90	18:13:00	53.8	5.8	-0.7	101.2	11.5
23 Oct 90	18:14:00	45.0	5.8	-0.7	102.6	11.5
23 Oct 90	18:15:00	38.5	5.8	-0.4	103.1	11.5
23 Oct 90	18:16:00	37.9	5.8	-0.7	102.6	11.5
23 Oct 90	18:17:00	40.6	5.7	-0.7	103.2	11.5
23 Oct 90	18:18:00	45.1	5.9	-0.6	102.4	11.4
23 Oct 90	18:19:00	43.4	5.9	-0.6	102.4	11.4
23 Oct 90	18:20:00	40.0	5.8	-0.6	102.3	11.4
23 Oct 90	18:21:00	37.7	5.8	-0.7	101.8	11.5
23 Oct 90	18:22:00	35.9	5.8	-0.8	103.2	11.5
23 Oct 90	18:23:00	34.5	5.8	-0.7	103.2	11.5
23 Oct 90	18:24:00	37.7	5.8	-0.7	103.4	11.5
23 Oct 90	18:25:00	37.6	5.9	-0.8	103.6	11.4
23 Oct 90	18:26:00	36.8	5.8	-0.8	103.1	11.5
	AVERAGE	48.6	5.7	-0.5	102.2	11.6
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	2.1	0.0	-1.9	0.2	0.0
	AVERAGE BIAS SPAN	254.5	6.0	22.8	242.5	5.1
	BIAS CORRECTED AVG	47.0	5.7	1.4	105.2	11.3

TEST T-3

25 OCTOBER 1990

TITLE: TEST THREE
NOTE : OIL

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
25 Oct 90	09:05:00	6.3	7.0	2.3	83.6	10.9
25 Oct 90	09:06:00	7.6	6.8	2.5	79.8	11.0
25 Oct 90	09:07:00	8.5	6.9	2.6	81.8	10.9
25 Oct 90	09:08:00	8.8	7.1	2.7	81.3	10.7
25 Oct 90	09:09:00	8.5	6.9	2.8	85.2	10.8
25 Oct 90	09:10:00	8.5	6.9	2.8	85.8	10.9
25 Oct 90	09:11:00	8.5	6.9	2.9	86.7	10.9
25 Oct 90	09:12:00	8.5	6.9	2.9	86.6	10.9
25 Oct 90	09:13:00	8.7	7.1	2.9	84.9	10.7
25 Oct 90	09:14:00	8.5	6.9	2.8	88.1	10.9
25 Oct 90	09:15:00	8.2	6.9	2.7	87.7	10.9
25 Oct 90	09:16:00	8.0	6.9	2.6	87.1	10.9
25 Oct 90	09:17:00	8.2	6.8	2.6	88.3	11.0
25 Oct 90	09:18:00	8.1	6.9	2.6	87.8	10.9
25 Oct 90	09:19:00	8.3	7.0	2.6	86.4	10.8
25 Oct 90	09:20:00	8.2	6.9	2.6	87.8	10.9
25 Oct 90	09:21:00	8.0	6.9	2.6	88.1	10.9
25 Oct 90	09:21:00	8.0	6.9	2.5	88.9	10.9
25 Oct 90	09:23:00	8.0	7.0	2.3	84.2	10.8
25 Oct 90	09:24:00	8.2	6.8	2.2	89.9	11.0
25 Oct 90	09:25:00	8.0	6.8	2.1	89.7	11.0
25 Oct 90	09:26:00	8.0	6.8	2.0	89.5	11.0
25 Oct 90	09:27:00	7.5	6.9	2.1	90.0	11.0
25 Oct 90	09:28:00	7.1	6.7	2.0	91.6	11.1
25 Oct 90	09:29:00	7.1	6.7	2.0	90.9	11.1
25 Oct 90	09:30:00	6.9	6.8	2.1	90.8	11.1
25 Oct 90	09:31:00	6.9	6.7	2.1	92.1	11.1
25 Oct 90	09:32:00	6.5	6.6	2.2	92.8	11.2
25 Oct 90	09:33:00	6.2	6.8	2.0	91.4	11.0
25 Oct 90	09:34:00	6.0	6.7	2.0	92.9	11.2
25 Oct 90	09:35:00	6.0	6.7	1.9	94.2	11.2
25 Oct 90	09:36:00	6.0	6.7	2.1	94.2	11.2
25 Oct 90	09:37:00	6.0	6.6	2.0	94.1	11.2
25 Oct 90	09:38:00	6.0	6.5	2.1	95.7	11.3
25 Oct 90	09:39:00	6.0	6.3	2.2	97.5	11.5
25 Oct 90	09:40:00	6.0	6.5	2.1	94.6	11.3
25 Oct 90	09:41:00	6.0	6.6	2.1	95.4	11.2
25 Oct 90	09:42:00	6.0	6.4	2.0	96.9	11.5
25 Oct 90	09:43:00	6.2	6.5	1.9	96.8	11.3
25 Oct 90	09:44:00	6.2	6.4	1.9	97.2	11.4
25 Oct 90	09:45:00	6.2	6.4	1.8	99.3	11.5
25 Oct 90	09:46:00	6.5	6.4	1.7	99.2	11.5
25 Oct 90	09:47:00	6.0	6.4	1.6	97.7	11.5
25 Oct 90	09:48:00	5.4	6.6	1.7	98.4	11.3
25 Oct 90	09:49:00	5.1	6.4	2.3	100.4	11.5
25 Oct 90	09:50:00	5.1	6.5	2.0	99.0	11.3
25 Oct 90	09:51:00	5.1	6.5	1.8	98.8	11.3
25 Oct 90	09:52:00	4.1	6.5	1.7	98.5	11.3
25 Oct 90	09:53:00	4.9	6.5	1.7	100.1	11.4
25 Oct 90	09:54:00	4.7	6.5	1.6	100.7	11.4
25 Oct 90	09:55:00	4.9	6.5	1.6	100.2	11.4
25 Oct 90	09:56:00	4.3	6.5	1.5	100.6	11.4
25 Oct 90	09:57:00	3.9	6.5	1.5	99.7	11.4
25 Oct 90	09:58:00	3.9	6.5	1.5	99.8	11.4
25 Oct 90	09:59:00	3.9	6.5	1.4	98.8	11.4
25 Oct 90	10:00:00	3.9	6.5	1.4	99.1	11.4
25 Oct 90	10:01:00	3.9	6.6	1.4	98.9	11.4
25 Oct 90	10:02:00	3.9	6.6	1.6	98.7	11.4
25 Oct 90	10:03:00	3.9	6.5	1.5	99.1	11.4
25 Oct 90	10:04:00	3.9	6.5	1.4	99.7	11.4
25 Oct 90	10:05:00	3.9	6.7	1.9	98.3	11.2
25 Oct 90	10:06:00	3.9	6.5	1.5	100.6	11.4
25 Oct 90	10:07:00	3.9	6.5	1.5	101.2	11.4
25 Oct 90	10:08:00	3.9	6.4	1.4	101.3	11.5
25 Oct 90	10:09:00	3.9	6.5	1.4	102.4	11.5
25 Oct 90	10:10:00	3.9	6.5	1.3	102.1	11.5
25 Oct 90	10:11:00	3.9	6.5	1.3	102.1	11.5
25 Oct 90	10:12:00	3.9	6.4	1.4	102.0	11.5
25 Oct 90	10:13:00	3.9	6.4	1.4	102.3	11.5
25 Oct 90	10:14:00	3.9	6.4	1.5	104.4	11.6
25 Oct 90	10:15:00	3.9	6.3	1.6	104.2	11.6
25 Oct 90	10:16:00	3.9	6.4	1.5	102.3	11.6

25 Oct 90	10:17:00	3.9	6.3	1.4	103.8	11.6
25 Oct 90	10:18:00	3.9	6.4	1.4	104.1	11.6
25 Oct 90	10:19:00	3.9	6.3	1.4	102.8	11.6
25 Oct 90	10:20:00	3.9	6.3	1.4	105.0	11.6
25 Oct 90	10:21:00	3.9	6.3	1.3	105.7	11.7
25 Oct 90	10:22:00	3.9	6.2	1.3	105.1	11.8
25 Oct 90	10:23:00	4.1	6.1	1.4	106.9	11.8
25 Oct 90	10:24:00	3.9	6.2	1.3	105.2	11.8
25 Oct 90	10:25:00	3.9	6.2	1.4	105.3	11.7
25 Oct 90	10:26:00	4.1	6.1	1.4	107.2	11.9
25 Oct 90	10:27:00	3.9	6.1	1.5	107.2	11.9
25 Oct 90	10:28:00	3.9	6.0	1.5	108.3	11.9
25 Oct 90	10:29:00	3.9	6.0	1.4	109.0	11.9
25 Oct 90	10:30:00	3.9	6.1	1.3	107.0	11.8
25 Oct 90	10:31:00	3.9	6.2	1.3	107.9	11.8
25 Oct 90	10:32:00	3.9	6.1	1.2	109.8	11.9
25 Oct 90	10:33:00	3.9	5.9	1.2	110.9	12.0
25 Oct 90	10:34:00	3.9	6.2	1.1	107.6	11.8
25 Oct 90	10:35:00	3.9	6.1	1.1	109.2	11.8
25 Oct 90	10:36:00	3.9	6.1	1.1	108.4	11.9
25 Oct 90	10:37:00	3.7	6.3	1.1	106.6	11.7
25 Oct 90	10:38:00	3.8	6.2	1.1	106.8	11.7
25 Oct 90	10:39:00	3.8	6.0	1.1	110.5	11.9
25 Oct 90	10:40:00	3.8	6.3	1.1	105.7	11.7
25 Oct 90	10:41:00	3.9	6.2	1.1	108.1	11.8
25 Oct 90	10:42:00	3.9	6.2	1.1	108.4	11.8
25 Oct 90	10:43:00	3.9	6.2	6.2	108.8	11.8
25 Oct 90	10:44:00	3.9	6.2	14.3	108.3	11.8
25 Oct 90	10:45:00	3.8	6.2	3.5	109.2	11.8
25 Oct 90	10:46:00	3.7	6.2	2.0	109.0	11.8
25 Oct 90	10:47:00	3.2	6.2	1.6	105.8	11.8
25 Oct 90	10:48:00	3.8	6.4	1.4	104.1	11.7
25 Oct 90	10:49:00	3.9	6.4	1.3	103.8	11.6
25 Oct 90	10:50:00	3.8	6.4	1.3	103.4	11.7
25 Oct 90	10:51:00	3.6	6.3	1.3	104.0	11.7
25 Oct 90	10:52:00	3.9	6.3	1.2	104.6	11.7
25 Oct 90	10:53:00	3.9	6.2	1.1	106.4	11.8
25 Oct 90	10:54:00	3.6	6.3	1.1	104.8	11.7
25 Oct 90	10:55:00	3.6	6.4	1.0	104.3	11.6
25 Oct 90	10:56:00	3.0	6.4	1.0	104.8	11.6
25 Oct 90	10:57:00	3.0	6.4	0.9	106.0	11.7
25 Oct 90	10:58:00	3.0	6.2	0.9	107.0	11.8
25 Oct 90	10:59:00	3.2	6.5	0.8	103.9	11.6
25 Oct 90	11:00:00	3.0	6.4	1.0	103.1	11.6
25 Oct 90	11:01:00	3.0	6.4	1.5	105.0	11.7
25 Oct 90	11:02:00	3.0	6.4	1.0	104.0	11.6
25 Oct 90	11:03:00	3.2	6.4	1.0	104.0	11.7
25 Oct 90	11:04:00	3.2	6.4	0.9	104.2	11.6
25 Oct 90	11:05:00	3.0	6.4	0.9	104.1	11.6
25 Oct 90	11:06:00	3.1	6.4	0.9	104.9	11.7
25 Oct 90	11:07:00	3.3	6.4	0.9	104.8	11.7
25 Oct 90	11:08:00	3.3	6.4	0.9	105.8	11.7
25 Oct 90	11:09:00	3.1	6.1	0.9	109.4	11.9
25 Oct 90	11:10:00	3.0	6.4	0.8	104.4	11.6
25 Oct 90	11:11:00	3.0	6.3	0.8	106.6	11.7
25 Oct 90	11:12:00	3.0	6.3	0.8	107.7	11.7
25 Oct 90	11:13:00	3.1	6.3	0.9	105.1	11.7
25 Oct 90	11:14:00	3.0	6.5	1.1	105.1	11.6
25 Oct 90	11:15:00	3.1	6.4	0.9	106.0	11.7
25 Oct 90	11:16:00	3.0	6.4	0.8	105.3	11.7
25 Oct 90	11:17:00	3.0	6.4	0.8	105.6	11.7
25 Oct 90	11:18:00	3.2	6.4	0.8	104.4	11.7
25 Oct 90	11:19:00	3.3	6.4	0.8	104.8	11.7
25 Oct 90	11:20:00	3.2	6.4	0.8	104.8	11.7
25 Oct 90	11:21:00	3.2	6.5	0.8	103.2	11.6
25 Oct 90	11:22:00	3.0	6.4	0.8	104.7	11.6
25 Oct 90	11:23:00	3.3	6.4	0.8	104.9	11.7
25 Oct 90	11:24:00	3.0	6.4	1.3	104.6	11.6
25 Oct 90	11:25:00	3.0	6.2	1.2	109.5	11.8
25 Oct 90	11:26:00	3.0	6.5	1.1	103.4	11.6
25 Oct 90	11:27:00	3.0	6.4	1.1	105.9	11.7
25 Oct 90	11:28:00	3.0	6.3	1.0	107.8	11.7
25 Oct 90	11:29:00	3.0	6.6	0.9	104.1	11.5
25 Oct 90	11:30:00	3.0	6.2	0.9	108.9	11.8
25 Oct 90	11:31:00	3.0	6.5	0.8	104.1	11.6
25 Oct 90	11:32:00	3.0	6.2	0.8	108.5	11.8
25 Oct 90	11:33:00	3.2	6.5	1.0	103.7	11.6
25 Oct 90	11:34:00	3.0	6.2	1.2	108.3	11.9
25 Oct 90	11:35:00	3.0	6.5	1.0	102.8	11.6

25 Oct 90	11:36:00	3.0	6.4	1.0	106.0	11.7
25 Oct 90	11:37:00	3.0	6.2	0.9	107.6	11.8
25 Oct 90	11:38:00	3.0	6.4	0.8	104.6	11.7
25 Oct 90	11:39:00	3.0	6.4	0.8	106.0	11.7
25 Oct 90	11:40:00	3.0	6.4	0.8	106.7	11.7
25 Oct 90	11:41:00	3.0	6.4	0.7	108.0	11.7
25 Oct 90	11:42:00	3.0	6.4	0.7	106.6	11.7
25 Oct 90	11:43:00	3.0	6.3	0.9	106.4	11.7
25 Oct 90	11:44:00	3.0	6.3	0.9	106.5	11.7
25 Oct 90	11:45:00	3.0	6.3	0.8	106.4	11.7
25 Oct 90	11:46:00	3.0	6.5	0.9	103.5	11.6
25 Oct 90	11:47:00	3.0	6.4	1.0	105.9	11.7
25 Oct 90	11:48:00	3.0	6.4	0.9	105.3	11.7
25 Oct 90	11:49:00	3.0	6.4	0.8	105.2	11.7
25 Oct 90	11:50:00	3.2	6.4	0.8	105.2	11.7
25 Oct 90	11:51:00	3.0	6.2	0.8	108.0	11.8
25 Oct 90	11:52:00	3.0	6.5	0.8	103.9	11.6
25 Oct 90	11:53:00	3.0	6.5	0.7	106.2	11.7
25 Oct 90	11:54:00	3.0	6.4	0.7	106.7	11.7
25 Oct 90	11:55:00	3.0	6.4	0.9	106.8	11.7
25 Oct 90	11:56:00	3.0	6.4	0.9	107.4	11.7
25 Oct 90	11:57:00	3.0	6.4	0.8	107.1	11.7
25 Oct 90	11:58:00	3.0	6.4	0.7	106.8	11.7
25 Oct 90	11:59:00	3.0	6.4	0.7	107.6	11.7
25 Oct 90	12:00:00	3.0	6.3	0.7	107.1	11.8
25 Oct 90	12:01:00	3.0	6.5	0.6	105.1	11.6
25 Oct 90	12:02:00	3.0	6.5	0.6	105.9	11.7
25 Oct 90	12:03:00	3.3	6.4	0.6	105.5	11.7
25 Oct 90	12:04:00	3.0	6.2	1.0	108.6	11.9
25 Oct 90	12:05:00	3.0	6.4	1.1	105.2	11.7
25 Oct 90	12:06:00	3.0	6.4	0.9	106.2	11.8
25 Oct 90	12:07:00	3.0	6.2	1.1	107.6	11.8
25 Oct 90	12:08:00	3.0	6.4	1.0	104.7	11.7
25 Oct 90	12:09:00	3.0	6.4	1.9	105.6	11.7
25 Oct 90	12:10:00	3.0	6.4	1.6	105.9	11.7
25 Oct 90	12:11:00	3.0	6.4	1.3	106.1	11.8
25 Oct 90	12:12:00	3.0	6.4	1.1	107.3	11.8
25 Oct 90	12:13:00	3.0	6.3	0.9	108.2	11.8
25 Oct 90	12:14:00	3.0	6.2	1.0	109.8	11.9
25 Oct 90	12:15:00	103.6	6.5	16.4	101.3	11.7
25 Oct 90	12:16:00	662.7	6.3	2.5	97.5	11.7
25 Oct 90	12:17:00	903.4	6.3	3.7	97.1	11.6
25 Oct 90	12:18:00	974.2	6.5	4.8	96.0	11.5
25 Oct 90	12:19:00	969.1	6.5	7.4	95.4	11.5
25 Oct 90	12:20:00	974.2	6.5	7.7	94.4	11.5
25 Oct 90	12:21:00	974.3	6.5	8.2	94.4	11.5
25 Oct 90	12:22:00	974.2	6.4	16.3	93.2	11.5
25 Oct 90	12:23:00	974.2	6.5	7.6	92.2	11.5
25 Oct 90	12:24:00	974.3	6.4	8.4	97.2	11.7
25 Oct 90	12:25:00	549.0	6.6	1.2	98.5	11.5
25 Oct 90	12:26:00	5.6	6.5	1.6	102.9	11.6
25 Oct 90	12:27:00	3.8	6.5	1.1	102.9	11.6
25 Oct 90	12:28:00	2.8	6.7	1.0	105.2	11.4
25 Oct 90	12:29:00	2.3	6.6	0.9	106.0	11.6
25 Oct 90	12:30:00	3.0	6.4	0.8	106.1	11.7
25 Oct 90	12:31:00	3.0	6.4	0.8	105.2	11.7
25 Oct 90	12:32:00	3.0	6.4	4.1	105.7	11.7
25 Oct 90	12:33:00	3.0	6.3	1.6	108.7	11.8
25 Oct 90	12:34:00	3.0	6.5	1.4	102.5	11.6
25 Oct 90	12:35:00	3.0	6.3	1.2	105.7	11.8
25 Oct 90	12:36:00	3.0	6.4	1.0	104.8	11.7
25 Oct 90	12:37:00	3.0	6.5	0.9	101.2	11.6
25 Oct 90	12:38:00	3.0	6.4	0.9	104.1	11.7
25 Oct 90	12:39:00	3.0	6.2	0.8	106.0	11.9
25 Oct 90	12:40:00	3.0	6.7	0.8	98.8	11.5
25 Oct 90	12:41:00	3.0	6.5	0.8	103.1	11.7
25 Oct 90	12:42:00	3.0	6.5	0.8	102.9	11.7
25 Oct 90	12:43:00	3.0	6.6	0.8	99.1	11.6
25 Oct 90	12:44:00	3.0	6.5	0.8	100.4	11.7
25 Oct 90	12:45:00	3.0	6.5	0.9	102.4	11.7
25 Oct 90	12:46:00	3.0	6.5	1.4	100.6	11.7
25 Oct 90	12:47:00	3.0	6.6	0.9	100.2	11.6
25 Oct 90	12:48:00	3.0	6.6	0.9	101.0	11.6
25 Oct 90	12:49:00	3.0	6.4	0.9	103.3	11.8
25 Oct 90	12:50:00	3.0	6.6	0.8	101.0	11.6
25 Oct 90	12:51:00	3.0	6.5	0.8	103.0	11.7
25 Oct 90	12:52:00	3.0	6.6	0.7	102.1	11.6
25 Oct 90	12:53:00	3.0	6.7	0.7	100.3	11.5
25 Oct 90	12:54:00	3.0	6.5	0.7	101.9	11.7

25 Oct 90	12:55:00	3.0	6.5	0.7	102.9	11.7
25 Oct 90	12:56:00	3.0	6.4	0.7	103.4	11.7
25 Oct 90	12:57:00	3.0	6.5	0.7	102.8	11.7
25 Oct 90	12:58:00	3.0	6.6	0.6	101.3	11.6
25 Oct 90	12:59:00	3.0	6.4	0.8	104.1	11.8
25 Oct 90	13:00:00	3.0	6.4	0.9	103.6	11.8
25 Oct 90	13:01:00	3.0	6.5	0.7	102.5	11.7
25 Oct 90	13:02:00	3.0	6.4	0.7	103.6	11.9
25 Oct 90	13:03:00	3.0	6.6	0.7	100.3	11.6
25 Oct 90	13:04:00	3.0	6.5	0.7	103.0	11.7
	AVERAGE	41.6	6.5	1.7	101.6	11.6
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	0.0	0.0	0.4	-0.1	0.0
	AVERAGE BIAS SPAN	255.5	6.0	26.9	244.5	5.1
	BIAS CORRECTED AVG	41.5	6.5	1.2	104.0	11.3

TITLE: TEST THREE
NOTE : SLURRY

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
25 Oct 90	15:00:00	112.2	6.7	4.2	45.8	11.9
25 Oct 90	15:01:00	152.7	5.9	7.5	50.0	12.6
25 Oct 90	15:02:00	148.9	6.1	3.9	50.3	12.3
25 Oct 90	15:03:00	81.9	6.6	3.6	48.6	11.9
25 Oct 90	15:04:00	83.4	6.8	3.5	47.2	11.7
25 Oct 90	15:05:00	79.2	6.9	3.3	46.7	11.6
25 Oct 90	15:06:00	86.2	6.7	3.4	47.3	11.8
25 Oct 90	15:07:00	88.4	6.5	3.4	48.1	12.0
25 Oct 90	15:08:00	92.6	6.5	3.4	47.6	12.0
25 Oct 90	15:09:00	89.2	6.5	3.4	47.5	12.0
25 Oct 90	15:10:00	81.9	6.5	3.5	47.3	11.9
25 Oct 90	15:11:00	78.5	6.5	3.1	47.4	11.9
25 Oct 90	15:12:00	79.1	6.5	3.1	47.4	12.0
25 Oct 90	15:13:00	118.8	5.8	4.6	50.9	12.6
25 Oct 90	15:14:00	113.3	6.1	3.1	50.1	12.3
25 Oct 90	15:15:00	55.7	6.7	2.7	48.7	11.8
25 Oct 90	15:16:00	51.8	6.9	2.6	48.8	11.6
25 Oct 90	15:17:00	51.8	6.9	2.7	48.7	11.5
25 Oct 90	15:18:00	53.7	6.9	2.7	48.5	11.5
25 Oct 90	15:19:00	51.0	7.1	2.8	47.9	11.4
25 Oct 90	15:20:00	50.0	7.0	2.7	48.3	11.5
25 Oct 90	15:21:00	50.2	7.0	2.6	48.3	11.5
25 Oct 90	15:22:00	52.7	7.1	2.6	47.5	11.4
25 Oct 90	15:23:00	47.5	6.7	2.4	49.5	11.7
25 Oct 90	15:24:00	51.0	6.8	2.4	49.8	11.7
25 Oct 90	15:25:00	48.1	6.8	2.2	50.9	11.7
25 Oct 90	15:26:00	45.5	6.9	2.6	50.4	11.5
25 Oct 90	15:27:00	44.1	7.0	2.2	50.0	11.5
25 Oct 90	15:28:00	45.7	7.1	2.0	49.8	11.4
25 Oct 90	15:29:00	40.4	7.0	1.9	50.5	11.5
25 Oct 90	15:30:00	39.0	7.0	1.8	50.3	11.5
25 Oct 90	15:31:00	39.3	6.9	1.8	49.9	11.5
25 Oct 90	15:32:00	40.1	7.0	2.1	49.4	11.4
25 Oct 90	15:33:00	42.4	7.0	1.8	50.1	11.5
25 Oct 90	15:34:00	45.2	6.5	2.1	52.8	12.0
25 Oct 90	15:35:00	77.7	5.7	1.9	55.7	12.6
25 Oct 90	15:36:00	51.9	6.4	1.8	54.7	12.1
25 Oct 90	15:37:00	47.2	6.6	1.8	53.8	11.9
25 Oct 90	15:38:00	43.2	6.7	1.7	52.5	11.8
25 Oct 90	15:39:00	39.4	6.8	2.0	53.0	11.7
25 Oct 90	15:40:00	43.3	6.9	2.2	51.4	11.6
25 Oct 90	15:41:00	49.4	7.0	1.8	50.8	11.5
25 Oct 90	15:42:00	46.3	7.0	1.7	51.1	11.5
25 Oct 90	15:43:00	46.5	7.0	1.6	50.4	11.5
25 Oct 90	15:44:00	46.8	7.0	1.5	50.0	11.5
25 Oct 90	15:45:00	49.8	6.9	1.6	50.2	11.6
25 Oct 90	15:46:00	52.4	7.0	1.6	49.2	11.5
25 Oct 90	15:47:00	52.4	7.1	1.9	48.6	11.4
25 Oct 90	15:48:00	56.8	7.1	1.7	48.0	11.4
25 Oct 90	15:49:00	54.5	6.9	1.6	49.5	11.7
25 Oct 90	15:50:00	50.5	6.6	20.7	50.7	11.9
25 Oct 90	15:51:00	48.3	6.8	36.6	51.2	11.7
25 Oct 90	15:52:00	46.7	6.8	4.3	51.2	11.7
25 Oct 90	15:53:00	49.1	6.7	2.7	52.3	11.8
25 Oct 90	15:54:00	47.1	6.8	2.2	52.5	11.7
25 Oct 90	15:55:00	45.3	6.8	2.0	53.2	11.7
25 Oct 90	15:56:00	53.2	6.8	1.9	53.1	11.7
25 Oct 90	15:57:00	46.0	6.8	1.6	53.6	11.7
25 Oct 90	15:58:00	46.3	6.8	1.5	53.3	11.7
25 Oct 90	15:59:00	46.2	6.8	1.5	52.5	11.6
25 Oct 90	16:00:00	47.4	6.8	1.4	52.8	11.7
25 Oct 90	16:01:00	42.6	6.9	1.3	51.8	11.6
25 Oct 90	16:02:00	44.4	6.9	1.4	51.8	11.6
25 Oct 90	16:03:00	40.6	6.9	1.4	51.3	11.6
25 Oct 90	16:04:00	48.4	6.9	1.4	51.1	11.6
25 Oct 90	16:05:00	44.8	6.6	1.4	52.5	11.8
25 Oct 90	16:07:00	52.4	6.2	1.4	53.9	12.2
25 Oct 90	16:08:00	51.7	6.3	1.8	53.9	12.1
25 Oct 90	16:09:00	46.5	6.4	2.0	53.7	12.0
25 Oct 90	16:10:00	46.4	6.5	1.5	53.2	11.9
25 Oct 90	16:11:00	44.6	6.5	1.5	53.5	11.9
25 Oct 90	16:12:00	43.9	6.5	1.4	52.7	11.9

25 Oct 90	16:13:00	51.0	6.5	1.4	52.9	11.9
25 Oct 90	16:14:00	47.8	6.4	1.3	53.4	12.0
25 Oct 90	16:15:00	43.9	6.6	1.3	52.4	11.9
25 Oct 90	16:16:00	48.0	6.5	1.3	52.7	12.0
25 Oct 90	16:17:00	50.2	6.2	1.4	54.5	12.2
25 Oct 90	16:18:00	43.7	6.2	1.3	55.4	12.2
25 Oct 90	16:19:00	42.9	6.2	1.3	54.8	12.2
25 Oct 90	16:20:00	49.4	6.3	1.3	53.2	12.1
25 Oct 90	16:21:00	47.6	6.4	1.4	52.0	12.0
25 Oct 90	16:22:00	52.2	6.4	1.3	51.9	12.0
25 Oct 90	16:23:00	47.4	6.3	1.2	52.4	12.1
25 Oct 90	16:24:00	46.1	6.3	1.3	53.0	12.1
25 Oct 90	16:25:00	43.2	6.4	1.2	52.5	12.0
25 Oct 90	16:26:00	47.4	6.6	1.2	51.4	11.8
25 Oct 90	16:27:00	44.1	6.5	1.3	51.7	11.9
25 Oct 90	16:28:00	48.9	6.2	1.3	52.1	12.1
25 Oct 90	16:29:00	49.6	6.2	1.3	51.5	12.1
25 Oct 90	16:30:00	53.2	6.3	1.3	50.5	12.1
25 Oct 90	16:31:00	47.4	6.4	1.2	49.9	12.0
25 Oct 90	16:32:00	48.8	6.7	1.2	48.6	11.8
25 Oct 90	16:33:00	52.5	6.4	1.2	49.7	12.0
25 Oct 90	16:34:00	52.6	6.3	1.2	49.7	12.0
25 Oct 90	16:35:00	49.9	6.4	1.2	49.6	12.0
25 Oct 90	16:36:00	45.8	6.6	1.1	48.7	11.8
25 Oct 90	16:37:00	47.5	6.8	1.1	48.1	11.6
25 Oct 90	16:38:00	48.8	6.6	1.1	48.2	11.8
25 Oct 90	16:39:00	58.3	6.7	1.2	47.5	11.7
25 Oct 90	16:40:00	56.8	6.7	1.1	47.2	11.6
25 Oct 90	16:41:00	56.8	6.8	1.0	46.8	11.6
25 Oct 90	16:42:00	53.8	6.8	1.1	46.4	11.6
25 Oct 90	16:43:00	53.7	6.8	1.1	46.5	11.6
25 Oct 90	16:44:00	55.0	6.8	1.1	46.1	11.6
25 Oct 90	16:45:00	56.4	6.5	1.2	48.5	11.9
25 Oct 90	16:46:00	55.2	6.3	1.2	49.5	12.0
25 Oct 90	16:47:00	47.5	6.6	1.1	48.9	11.8
25 Oct 90	16:48:00	51.9	6.5	1.1	50.0	11.9
25 Oct 90	16:49:00	51.8	6.4	1.0	50.5	12.0
25 Oct 90	16:50:00	44.8	6.3	1.0	51.8	12.1
25 Oct 90	16:51:00	45.8	6.4	1.1	50.7	12.0
25 Oct 90	16:52:00	48.1	6.6	1.1	49.7	11.8
25 Oct 90	16:53:00	48.2	6.5	1.1	50.5	11.8
25 Oct 90	16:54:00	48.4	6.5	1.1	50.3	11.9
25 Oct 90	16:55:00	47.9	6.5	1.1	50.0	11.9
25 Oct 90	16:56:00	47.7	6.7	1.1	49.4	11.7
25 Oct 90	16:57:00	48.8	6.6	1.1	49.6	11.8
25 Oct 90	16:58:00	45.9	6.5	1.1	49.6	11.9
25 Oct 90	16:59:00	49.9	6.4	1.1	49.9	12.0
25 Oct 90	17:00:00	49.4	6.6	1.1	49.3	11.8
25 Oct 90	17:01:00	50.1	6.7	1.0	48.4	11.7
25 Oct 90	17:02:00	49.4	6.8	1.0	48.0	11.6
25 Oct 90	17:03:00	51.7	7.0	1.0	47.6	11.5
25 Oct 90	17:04:00	51.2	6.8	1.0	48.5	11.6
25 Oct 90	17:05:00	52.4	6.7	0.9	48.6	11.7
25 Oct 90	17:06:00	51.9	6.6	0.9	48.7	11.8
25 Oct 90	17:07:00	51.0	6.7	0.9	47.8	11.7
25 Oct 90	17:08:00	51.4	6.8	1.1	46.8	11.6
25 Oct 90	17:09:00	60.2	6.9	1.1	47.2	11.5
25 Oct 90	17:10:00	52.0	6.8	0.9	47.8	11.6
25 Oct 90	17:11:00	48.4	6.9	0.9	46.6	11.5
25 Oct 90	17:12:00	49.6	6.9	1.0	46.9	11.5
25 Oct 90	17:13:00	56.4	6.7	0.9	47.9	11.7
25 Oct 90	17:14:00	55.5	6.6	0.9	49.4	11.8
25 Oct 90	17:15:00	51.0	6.6	0.8	50.0	11.8
25 Oct 90	17:16:00	52.3	6.8	0.9	49.0	11.6
25 Oct 90	17:17:00	47.9	6.8	0.8	49.6	11.6
25 Oct 90	17:18:00	49.0	6.5	0.8	50.6	11.8
25 Oct 90	17:19:00	44.2	6.5	0.8	50.4	11.8
25 Oct 90	17:20:00	46.6	6.7	0.9	49.1	11.6
25 Oct 90	17:21:00	47.7	6.7	0.8	49.3	11.6
25 Oct 90	17:22:00	47.2	6.7	0.9	49.5	11.7
25 Oct 90	17:23:00	49.2	6.6	0.8	49.6	11.7
25 Oct 90	17:24:00	48.2	6.5	0.8	50.2	11.8
25 Oct 90	17:25:00	49.2	6.6	0.9	49.6	11.7
25 Oct 90	17:26:00	53.1	6.7	0.8	49.9	11.7
25 Oct 90	17:27:00	46.2	6.7	0.8	49.9	11.7
25 Oct 90	17:28:00	48.8	6.6	0.8	50.3	11.8
25 Oct 90	17:29:00	49.4	6.6	0.8	49.3	11.8
25 Oct 90	17:30:00	47.5	6.9	0.9	47.7	11.5
25 Oct 90	17:31:00	56.0	7.2	1.1	46.2	11.3

25 Oct 90	17:32:00	51.9	7.0	0.9	47.1	11.4
25 Oct 90	17:33:00	49.4	7.0	0.9	46.7	11.4
25 Oct 90	17:34:00	53.2	7.0	0.9	46.8	11.4
25 Oct 90	17:35:00	63.5	7.4	1.7	43.8	11.0
25 Oct 90	17:36:00	105.3	7.8	1.5	41.4	10.7
25 Oct 90	17:37:00	104.3	7.8	2.0	41.1	10.7
25 Oct 90	17:38:00	135.6	7.4	5.6	56.4	8.4
	AVERAGE	55.2	6.7	2.0	49.9	11.7
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	0.0	0.0	0.4	0.0	0.0
	AVERAGE BIAS SPAN	255.5	6.0	26.9	244.5	5.1
	BIAS CORRECTED AVG	55.1	6.7	1.5	51.1	11.5

TITLE: TEST THREE
NOTE : ACETONE

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
25 Oct 90	18:52:00	12.1	6.4	3.7	64.6	11.6
25 Oct 90	18:53:00	15.0	8.5	3.5	63.0	10.4
25 Oct 90	18:54:00	39.2	3.0	2.6	84.0	14.5
25 Oct 90	18:55:00	19.3	3.8	2.3	71.5	13.2
25 Oct 90	18:56:00	16.6	7.8	2.2	68.5	10.9
25 Oct 90	18:57:00	19.9	2.9	2.1	83.7	14.6
25 Oct 90	18:58:00	22.9	8.0	1.8	54.5	9.7
25 Oct 90	18:59:00	14.9	3.8	2.1	82.5	14.0
25 Oct 90	19:00:00	27.0	2.8	2.1	83.6	14.6
25 Oct 90	19:01:00	25.3	2.8	2.0	83.5	14.7
25 Oct 90	19:02:00	23.1	2.8	2.0	84.2	14.6
25 Oct 90	19:03:00	21.8	2.9	2.0	84.3	14.6
25 Oct 90	19:04:00	18.6	2.9	2.0	83.5	14.6
25 Oct 90	19:05:00	23.7	2.9	2.0	83.7	14.6
25 Oct 90	19:06:00	31.9	2.6	2.1	83.1	14.8
25 Oct 90	19:07:00	25.2	3.1	2.0	83.3	14.3
25 Oct 90	19:08:00	17.9	3.0	2.1	82.3	14.5
25 Oct 90	19:09:00	20.9	3.1	2.0	82.2	14.4
25 Oct 90	19:10:00	15.4	3.1	2.3	82.5	14.4
25 Oct 90	19:11:00	18.0	3.0	2.4	82.2	14.5
25 Oct 90	19:12:00	21.3	3.0	2.2	82.5	14.5
25 Oct 90	19:13:00	19.1	2.9	2.4	83.0	14.6
25 Oct 90	19:14:00	22.9	2.9	2.3	83.2	14.6
25 Oct 90	19:15:00	21.1	3.0	2.1	83.1	14.5
25 Oct 90	19:16:00	17.6	3.2	2.7	83.3	14.3
25 Oct 90	19:17:00	19.5	3.0	2.1	84.1	14.5
25 Oct 90	19:18:00	17.6	2.9	2.0	84.3	14.6
25 Oct 90	19:19:00	18.2	5.7	1.9	79.0	12.1
25 Oct 90	19:20:00	60.5	4.4	2.2	86.7	13.7
25 Oct 90	19:21:00	32.0	5.2	1.9	85.3	12.9
25 Oct 90	19:22:00	17.5	6.5	1.8	80.4	11.7
25 Oct 90	19:23:00	22.0	7.0	1.8	80.3	11.4
25 Oct 90	19:24:00	38.8	4.0	3.0	83.6	14.0
25 Oct 90	19:25:00	233.5	3.9	2.3	79.6	14.1
25 Oct 90	19:26:00	45.4	6.5	1.7	77.8	11.9
25 Oct 90	19:27:00	34.6	6.8	1.6	76.6	11.7
25 Oct 90	19:28:00	42.4	7.3	1.7	75.7	11.3
25 Oct 90	19:29:00	43.9	7.1	1.6	77.0	11.6
25 Oct 90	19:30:00	40.5	4.3	1.6	82.8	14.1
25 Oct 90	19:31:00	81.3	3.5	1.9	83.7	14.6
25 Oct 90	19:32:00	68.0	4.4	1.7	90.1	13.9
25 Oct 90	19:33:00	27.2	4.8	1.5	92.6	13.6
25 Oct 90	19:34:00	20.0	5.0	1.4	93.7	13.5
25 Oct 90	19:35:00	18.3	5.2	1.4	92.7	13.3
25 Oct 90	19:36:00	15.5	5.5	1.5	90.7	13.0
25 Oct 90	19:37:00	14.9	5.7	1.3	87.4	12.8
25 Oct 90	19:40:00	13.7	6.6	1.4	81.8	11.9
25 Oct 90	19:41:00	11.9	6.7	1.1	81.1	11.9
25 Oct 90	19:42:00	18.0	7.1	1.2	77.5	11.5
25 Oct 90	19:43:00	23.5	7.3	1.1	76.7	11.3
25 Oct 90	19:44:00	22.7	7.3	1.2	78.4	11.4
25 Oct 90	19:45:00	28.0	7.7	1.8	73.7	11.0
25 Oct 90	19:46:00	40.0	7.8	1.6	73.6	10.9
25 Oct 90	19:47:00	34.0	7.8	1.3	73.5	10.8
25 Oct 90	19:48:00	29.5	7.7	1.1	74.5	11.0
25 Oct 90	19:49:00	19.0	7.2	1.0	78.1	11.5
25 Oct 90	19:50:00	16.0	7.2	1.0	78.4	11.5
25 Oct 90	19:51:00	16.0	7.0	1.1	78.1	11.7
25 Oct 90	19:52:00	18.1	7.2	1.0	78.1	11.5
25 Oct 90	19:53:00	16.6	7.1	1.0	77.9	11.6
25 Oct 90	19:54:00	19.4	7.4	1.0	75.8	11.3
25 Oct 90	19:55:00	23.9	7.5	1.2	75.2	11.2
25 Oct 90	19:56:00	25.8	7.5	1.5	74.7	11.1
25 Oct 90	19:57:00	21.1	7.5	1.3	75.4	11.2
25 Oct 90	19:58:00	31.7	7.8	1.8	71.7	10.9
25 Oct 90	19:59:00	43.3	7.5	1.2	75.8	11.2
25 Oct 90	20:00:00	27.4	7.7	1.7	73.7	11.0
25 Oct 90	20:01:00	26.2	7.1	1.1	78.3	11.6
25 Oct 90	20:02:00	12.7	6.8	1.1	80.4	11.9
25 Oct 90	20:03:00	14.4	7.0	1.1	79.7	11.7
25 Oct 90	20:04:00	13.7	7.1	1.0	78.1	11.6
25 Oct 90	20:05:00	13.2	7.1	1.0	78.7	11.6

25 Oct 90	20:06:00	18.4	7.2	1.0	77.5	11.5
25 Oct 90	20:07:00	20.0	7.4	1.0	76.0	11.3
25 Oct 90	20:08:00	20.5	7.5	1.5	75.4	11.2
25 Oct 90	20:09:00	25.9	7.6	1.5	75.0	11.1
25 Oct 90	20:10:00	30.9	7.8	1.4	72.7	11.0
25 Oct 90	20:11:00	49.6	8.1	2.1	70.7	10.7
25 Oct 90	20:12:00	62.6	8.1	2.0	71.4	10.7
25 Oct 90	20:13:00	43.4	7.9	1.7	72.7	10.9
25 Oct 90	20:14:00	100.3	8.8	4.9	64.7	10.1
25 Oct 90	20:15:00	90.6	8.0	2.1	72.3	10.9
25 Oct 90	20:16:00	69.6	8.2	3.1	68.5	10.6
25 Oct 90	20:17:00	79.6	8.4	3.0	67.5	10.4
25 Oct 90	20:18:00	80.1	8.6	2.8	66.0	10.3
25 Oct 90	20:19:00	86.1	8.3	2.3	68.2	10.5
25 Oct 90	20:20:00	122.1	8.9	5.9	63.0	10.0
25 Oct 90	20:21:00	115.4	8.5	3.3	66.8	10.4
25 Oct 90	20:22:00	200.9	9.0	13.3	63.2	10.0
25 Oct 90	20:23:00	76.5	6.9	1.4	77.8	11.9
25 Oct 90	20:24:00	61.5	8.5	3.7	66.8	10.4
25 Oct 90	20:25:00	79.6	8.1	1.9	71.4	10.8
25 Oct 90	20:26:00	43.7	7.8	2.9	71.4	11.0
25 Oct 90	20:27:00	49.8	7.2	1.6	76.8	11.5
25 Oct 90	20:28:00	65.6	8.2	2.9	69.0	10.6
25 Oct 90	20:29:00	71.4	8.2	3.3	69.1	10.6
25 Oct 90	20:30:00	34.4	6.8	1.1	78.6	11.9
25 Oct 90	20:31:00	44.6	8.1	2.5	69.6	10.7
25 Oct 90	20:32:00	45.2	7.6	1.3	73.1	11.2
25 Oct 90	20:33:00	141.8	6.4	12.8	75.4	12.5
25 Oct 90	20:34:00	519.3	1.0	72.2	81.4	17.3
25 Oct 90	20:35:00	OFF SCALE	1.0	44.0	82.0	17.2
25 Oct 90	20:36:00	716.1	2.3	2.2	88.4	16.0
25 Oct 90	20:37:00	121.3	3.3	1.9	89.8	15.0
25 Oct 90	20:38:00	53.4	3.6	1.4	93.8	14.7
FLAMEOUT						
25 Oct 90	20:46:00	528.7	3.0	SAMPLE	63.2	13.0
25 Oct 90	20:47:00	OFF SCALE	0.1	LINE	62.8	16.5
25 Oct 90	20:48:00		0.1	CONTAMINATED	63.1	16.7
25 Oct 90	20:49:00	571.7	0.9	FROM	71.6	15.8
25 Oct 90	20:50:00	345.7	-0.1	FLAME	54.9	14.9
25 Oct 90	20:51:00	46.6	3.2	OUT	76.5	14.3
25 Oct 90	20:52:00	132.2	7.0		71.3	11.3
25 Oct 90	20:53:00	72.7	7.1		72.8	11.5
25 Oct 90	20:54:00	43.0	5.8		77.5	12.7
25 Oct 90	20:55:00	37.6	5.2		78.5	13.3
25 Oct 90	20:56:00	41.5	4.9		80.1	13.5
25 Oct 90	20:57:00	37.6	4.9		80.4	13.4
25 Oct 90	20:58:00	36.4	5.1		80.0	13.3
25 Oct 90	20:59:00	36.4	5.3		78.7	13.1
25 Oct 90	21:00:00	35.3	5.5		78.6	13.0
25 Oct 90	21:01:00	31.9	5.6		78.2	12.8
25 Oct 90	21:02:00	31.3	5.8		78.0	12.7
25 Oct 90	21:03:00	30.3	5.9		77.2	12.6
25 Oct 90	21:04:00	31.4	5.9		77.5	12.6
25 Oct 90	21:05:00	29.4	5.4		78.3	13.0
25 Oct 90	21:06:00	25.9	5.5		78.7	13.0
25 Oct 90	21:07:00	27.3	5.7		78.1	12.8
25 Oct 90	21:08:00	24.1	5.9		78.3	12.7
25 Oct 90	21:09:00	20.7	6.2		79.0	12.4
25 Oct 90	21:10:00	18.2	6.3		79.9	12.3
25 Oct 90	21:11:00	18.5	6.6		78.0	12.0
25 Oct 90	21:12:00	21.6	6.9		78.6	11.8
25 Oct 90	21:13:00	22.0	6.9		78.1	11.8
25 Oct 90	21:14:00	21.7	6.8		77.9	11.8
25 Oct 90	21:15:00	21.8	6.9		77.1	11.7
25 Oct 90	21:16:00	24.5	7.1		77.0	11.6
25 Oct 90	21:17:00	26.9	7.2		75.9	11.5
25 Oct 90	21:18:00	31.6	7.3		75.4	11.4
25 Oct 90	21:19:00	31.5	7.3		75.1	11.4
25 Oct 90	21:20:00	33.1	7.3		74.3	11.4
25 Oct 90	21:21:00	34.7	7.4		74.1	11.3
25 Oct 90	21:22:00	36.7	7.4		73.7	11.3
25 Oct 90	21:23:00	31.3	7.3		75.0	11.4
25 Oct 90	21:24:00	21.0	7.1		76.0	11.6
25 Oct 90	21:25:00	25.1	7.4		74.0	11.3
25 Oct 90	21:26:00	27.9	7.5		72.9	11.3
25 Oct 90	21:27:00	29.9	7.4		73.9	11.3
25 Oct 90	21:28:00	34.4	7.5		72.9	11.2
25 Oct 90	21:29:00	31.2	7.5		74.2	11.3
25 Oct 90	21:30:00	26.1	7.4		74.0	11.4

25 Oct 90	21:31:00	24.5	7.4	71.9	11.3
25 Oct 90	21:32:00	24.5	7.6	71.4	11.2
25 Oct 90	21:33:00	26.6	7.6	72.1	11.1
25 Oct 90	21:34:00	21.2	7.5	72.8	11.3
25 Oct 90	21:35:00	17.7	7.0	75.6	11.8
25 Oct 90	21:36:00	14.4	6.8	76.7	11.9
25 Oct 90	21:37:00	15.9	6.9	74.8	11.9
25 Oct 90	21:38:00	21.4	7.1	73.3	11.7
25 Oct 90	21:39:00	21.1	7.1	74.0	11.7
25 Oct 90	21:40:00	25.2	7.4	73.7	11.4
25 Oct 90	21:41:00	25.9	7.5	72.4	11.3
25 Oct 90	21:42:00	28.6	7.6	71.8	11.2
25 Oct 90	21:43:00	43.4	7.8	69.9	11.0
25 Oct 90	21:44:00	55.9	7.9	69.3	10.9
25 Oct 90	21:45:00	58.8	7.8	69.8	11.0
25 Oct 90	21:46:00	34.6	7.5	71.7	11.3
25 Oct 90	21:47:00	37.8	7.6	71.2	11.2
25 Oct 90	21:48:00	35.4	7.7	70.3	11.1
25 Oct 90	21:49:00	53.1	7.9	68.6	11.0
25 Oct 90	21:50:00	55.6	8.0	68.5	10.9
25 Oct 90	21:51:00	54.0	8.0	67.2	10.8
25 Oct 90	21:52:00	35.4	7.2	72.7	11.6
25 Oct 90	21:53:00	24.5	7.3	71.0	11.5
25 Oct 90	21:54:00	31.9	7.3	72.2	11.5
25 Oct 90	21:55:00	31.2	7.4	71.0	11.4
25 Oct 90	21:56:00	40.0	7.6	69.2	11.2
25 Oct 90	21:57:00	32.8	7.7	70.4	11.1
25 Oct 90	21:58:00	39.6	7.7	70.4	11.2
25 Oct 90	21:59:00	26.0	7.0	74.1	11.8
25 Oct 90	22:00:00	24.7	7.1	73.1	11.7
25 Oct 90	22:01:00	30.3	7.1	73.3	11.7
25 Oct 90	22:02:00	18.2	6.5	77.7	12.3
25 Oct 90	22:03:00	13.9	6.2	77.9	12.6
25 Oct 90	22:04:00	15.2	6.0	78.0	12.8
25 Oct 90	22:05:00	14.3	5.6	80.5	13.1
25 Oct 90	22:06:00	15.2	5.4	80.7	13.3
25 Oct 90	22:06:00	13.5	5.7	79.0	13.0
25 Oct 90	22:08:00	13.5	5.6	79.9	13.1
25 Oct 90	22:09:00	13.5	5.6	79.5	13.1
25 Oct 90	22:10:00	13.5	5.6	80.2	13.1
25 Oct 90	22:11:00	12.7	5.8	78.5	12.9
25 Oct 90	22:12:00	13.7	5.9	78.0	12.8
25 Oct 90	22:13:00	13.4	5.9	78.5	12.9
25 Oct 90	22:14:00	13.7	5.8	79.0	12.9
25 Oct 90	22:15:00	12.5	5.9	78.4	12.8
25 Oct 90	22:16:00	13.7	6.1	78.1	12.7
25 Oct 90	22:17:00	14.4	6.1	77.8	12.6
25 Oct 90	22:18:00	14.6	6.3	75.3	12.4
25 Oct 90	22:19:00	13.9	6.4	76.1	12.4
25 Oct 90	22:20:00	12.8	6.4	76.3	12.4
25 Oct 90	22:21:00	15.5	6.5	75.0	12.3
25 Oct 90	22:22:00	17.7	6.6	75.0	12.2
25 Oct 90	22:23:00	15.5	6.7	74.8	12.1
25 Oct 90	22:24:00	16.7	6.4	75.8	12.4
25 Oct 90	22:25:00	13.8	6.4	76.3	12.4
25 Oct 90	22:26:00	15.2	5.9	78.2	12.9
25 Oct 90	22:27:00	13.3	5.9	76.5	12.8
25 Oct 90	22:28:00	12.3	6.0	76.2	12.7
25 Oct 90	22:29:00	13.6	5.7	78.9	13.1
25 Oct 90	22:30:00	16.1	5.1	82.3	13.6
25 Oct 90	22:31:00	19.9	4.7	82.9	13.9
25 Oct 90	22:32:00	23.7	4.6	83.1	14.0
25 Oct 90	22:33:00	24.1	4.5	83.6	14.0
25 Oct 90	22:34:00	31.1	4.3	83.9	14.2
25 Oct 90	22:35:00	33.4	4.0	83.3	14.4
25 Oct 90	22:36:00	42.4	3.9	83.5	14.5
25 Oct 90	22:37:00	38.0	4.1	84.2	14.3
25 Oct 90	22:38:00	28.4	4.2	84.5	14.3
25 Oct 90	22:39:00	27.7	4.5	83.6	14.0
25 Oct 90	22:40:00	26.9	4.6	82.1	13.9
25 Oct 90	22:41:00	23.9	4.9	81.2	13.7
25 Oct 90	22:42:00	18.9	4.9	82.2	13.6
25 Oct 90	22:43:00	18.3	5.2	80.4	13.4
25 Oct 90	22:44:00	17.3	5.1	82.6	13.5
25 Oct 90	22:45:00	17.1	5.1	82.7	13.6
25 Oct 90	22:46:00	20.9	4.6	84.1	13.9
25 Oct 90	22:47:00	21.6	4.7	82.8	13.9
25 Oct 90	22:48:00	18.8	5.0	81.0	13.6
25 Oct 90	22:49:00	17.2	5.1	81.8	13.5

25 Oct 90	22:50:00	16.3	5.2	81.8	13.4
25 Oct 90	22:51:00	14.8	5.3	81.0	13.3
25 Oct 90	22:52:00	14.8	5.4	80.3	13.2
25 Oct 90	22:53:00	13.6	5.6	79.8	13.1
25 Oct 90	22:54:00	13.5	5.8	80.1	12.9
25 Oct 90	22:55:00	13.5	6.0	77.9	12.7
25 Oct 90	22:56:00	14.7	5.9	78.5	12.9
25 Oct 90	22:57:00	14.0	5.1	83.0	13.5
25 Oct 90	22:58:00	21.7	4.7	81.9	13.9
25 Oct 90	22:59:00	22.3	4.7	81.7	13.9
25 Oct 90	23:00:00	24.6	4.4	82.5	14.1
25 Oct 90	23:01:00	25.7	4.6	82.6	14.0
25 Oct 90	23:02:00	32.4	4.5	83.0	14.1
25 Oct 90	23:03:00	28.0	4.4	82.7	14.1
25 Oct 90	23:04:00	27.9	4.5	82.2	14.0
25 Oct 90	23:05:00	26.0	4.5	81.3	14.0
25 Oct 90	23:06:00	27.1	4.5	80.8	14.0
25 Oct 90	23:07:00	22.3	4.7	81.4	13.9
25 Oct 90	23:08:00	19.8	4.5	83.0	14.0
25 Oct 90	23:09:00	21.7	4.7	83.4	13.8
25 Oct 90	23:10:00	19.7	4.7	83.6	13.9
25 Oct 90	23:11:00	17.6	5.0	81.8	13.7
25 Oct 90	23:12:00	18.5	4.8	83.2	13.8
25 Oct 90	23:13:00	19.2	5.0	81.5	13.6
25 Oct 90	23:14:00	17.5	5.0	80.8	13.6
25 Oct 90	23:15:00	16.5	5.3	80.7	13.4
25 Oct 90	23:16:00	13.2	5.7	78.8	13.0
25 Oct 90	23:17:00	13.6	5.6	78.8	13.1
25 Oct 90	23:18:00	14.3	5.3	80.1	13.4
25 Oct 90	23:19:00	16.2	5.1	80.5	13.5
25 Oct 90	23:20:00	14.5	5.3	80.0	13.4
25 Oct 90	23:21:00	13.6	5.5	79.0	13.1
25 Oct 90	23:22:00	13.3	5.6	78.5	13.1
25 Oct 90	23:23:00	15.4	5.2	79.6	13.5
25 Oct 90	23:24:00	23.0	4.5	81.1	14.1
25 Oct 90	23:25:00	70.6	3.5	82.0	15.0
25 Oct 90	23:26:00	147.4	3.0	83.7	15.5
25 Oct 90	23:27:00	350.6	2.5	82.6	16.1
25 Oct 90	23:28:00	396.5	3.0	82.6	15.5
25 Oct 90	23:29:00	209.3	3.1	82.4	15.3
25 Oct 90	23:30:00	160.9	3.1	83.2	15.4
25 Oct 90	23:31:00	186.3	2.9	84.3	15.6
25 Oct 90	23:32:00	165.2	2.9	84.3	15.5
25 Oct 90	23:33:00	100.9	4.0	81.9	14.5
25 Oct 90	23:34:00	25.8	4.6	82.6	14.0
25 Oct 90	23:35:00	34.2	4.3	83.0	14.3
25 Oct 90	23:36:00	35.4	4.3	83.0	14.2
25 Oct 90	23:37:00	24.9	4.7	83.0	13.9
25 Oct 90	23:38:00	21.1	4.8	82.4	13.8
25 Oct 90	23:39:00	23.7	4.7	81.8	13.9
25 Oct 90	23:40:00	21.0	4.8	82.4	13.8
25 Oct 90	23:41:00	18.0	5.1	81.1	13.6
25 Oct 90	23:42:00	17.9	5.2	80.6	13.5
25 Oct 90	23:43:00	15.9	5.3	81.5	13.3
25 Oct 90	23:44:00	14.3	5.4	81.0	13.3
25 Oct 90	23:45:00	14.9	5.4	79.9	13.3
25 Oct 90	23:46:00	14.7	5.6	80.2	13.1
25 Oct 90	23:47:00	14.6	5.6	79.3	13.1
25 Oct 90	23:48:00	14.5	5.8	78.7	12.9
25 Oct 90	23:49:00	14.7	6.0	78.2	12.7
25 Oct 90	23:50:00	14.4	5.9	78.3	12.9
FLAMEOUT					
26 Oct 90	00:12:00	43.9	5.9	77.2	12.4
26 Oct 90	00:13:00	44.0	6.2	75.0	12.1
26 Oct 90	00:14:00	59.6	6.6	73.8	12.0
26 Oct 90	00:15:00	36.6	6.7	72.7	11.9
26 Oct 90	00:16:00	47.9	7.5	72.6	11.2
26 Oct 90	00:17:00	31.9	7.2	75.7	11.5
26 Oct 90	00:18:00	28.5	7.2	76.2	11.6
26 Oct 90	00:19:00	19.3	6.6	78.9	12.1
26 Oct 90	00:20:00	16.0	6.3	79.2	12.5
26 Oct 90	00:21:00	16.9	6.0	80.9	12.8
26 Oct 90	00:22:00	19.3	6.2	78.8	12.6
26 Oct 90	00:23:00	20.4	5.3	86.4	13.5
26 Oct 90	00:24:00	20.0	5.2	86.0	13.5
26 Oct 90	00:25:00	20.9	5.2	85.2	13.5
26 Oct 90	00:26:00	22.7	5.0	86.5	13.7
26 Oct 90	00:27:00	23.1	4.9	86.9	13.7
26 Oct 90	00:28:00	21.0	5.1	85.7	13.5

26 Oct 90	00:29:00	19.1	5.3	84.1	13.4
26 Oct 90	00:30:00	18.7	5.4	84.0	13.3
26 Oct 90	00:31:00	16.7	5.5	84.2	13.3
FLAMEOUT					
26 Oct 90	00:43:00	32.0	7.0	67.9	11.5
26 Oct 90	00:44:00	48.6	8.0	65.8	10.8
26 Oct 90	00:45:00	38.0	6.9	74.0	11.9
26 Oct 90	00:46:00	17.3	7.1	74.4	11.7
26 Oct 90	00:47:00	14.3	6.4	78.3	12.4
26 Oct 90	00:48:00	15.3	5.2	85.3	13.5
26 Oct 90	00:49:00	22.2	5.1	87.5	13.6
26 Oct 90	00:50:00	18.8	5.0	89.0	13.7
26 Oct 90	00:51:00	26.3	4.6	89.7	14.0
26 Oct 90	00:52:00	26.5	4.6	90.7	14.1
26 Oct 90	00:53:00	31.5	4.3	92.0	14.2
26 Oct 90	00:54:00	37.2	4.2	91.9	14.3
26 Oct 90	00:55:00	38.9	4.3	92.0	14.2
26 Oct 90	00:56:00	28.1	4.5	90.6	14.1
26 Oct 90	00:57:00	26.8	4.7	90.9	13.9
26 Oct 90	00:58:00	21.4	4.8	89.2	13.8
26 Oct 90	00:59:00	20.7	4.8	88.3	13.8
26 Oct 90	01:00:00	20.5	4.8	88.5	13.9
26 Oct 90	01:01:00	212.3	2.9	94.0	15.7
26 Oct 90	01:02:00	224.3	3.1	93.7	15.5
26 Oct 90	01:03:00	170.8	3.6	92.5	14.8
26 Oct 90	01:04:00	43.2	4.2	91.0	14.3
26 Oct 90	01:05:00	30.4	4.3	91.9	14.2
26 Oct 90	01:06:00	27.9	4.4	89.7	14.1
26 Oct 90	01:07:00	22.1	4.6	90.2	13.9
26 Oct 90	01:08:00	20.8	4.9	88.9	13.7
26 Oct 90	01:09:00	18.5	5.0	87.6	13.6
26 Oct 90	01:10:00	17.8	5.1	87.6	13.6
26 Oct 90	01:11:00	16.2	5.1	86.9	13.6
26 Oct 90	01:12:00	21.7	4.9	87.2	13.7
26 Oct 90	01:13:00	17.7	5.0	88.0	13.7
26 Oct 90	01:14:00	17.4	5.1	88.4	13.6
26 Oct 90	01:15:00	42.3	4.0	92.8	14.6
26 Oct 90	01:16:00	221.0	2.8	94.5	15.8
26 Oct 90	01:17:00	605.7	2.3	94.2	16.3
26 Oct 90	01:18:00	909.6	2.1	94.5	16.4
26 Oct 90	01:19:00	548.0	2.5	94.0	16.0
26 Oct 90	01:20:00	600.8	2.4	95.1	16.2
26 Oct 90	01:21:00	829.8	2.2	93.8	16.3
26 Oct 90	01:22:00	515.6	2.7	93.7	15.9
26 Oct 90	01:23:00	325.6	3.0	94.6	15.5
26 Oct 90	01:24:00	112.1	3.6	95.5	14.8
26 Oct 90	01:25:00	65.1	3.8	94.1	14.7
26 Oct 90	01:26:00	47.8	4.0	93.7	14.5
26 Oct 90	01:27:00	36.4	4.2	92.3	14.3
26 Oct 90	01:28:00	44.0	4.1	91.9	14.4
26 Oct 90	01:29:00	44.1	4.2	90.6	14.3
26 Oct 90	01:30:00	30.3	4.4	90.9	14.2
26 Oct 90	01:31:00	32.9	4.4	90.7	14.1
26 Oct 90	01:32:00	24.0	4.5	91.8	14.1
26 Oct 90	01:33:00	25.9	4.7	90.5	13.9
26 Oct 90	01:34:00	19.7	4.9	88.0	13.8
26 Oct 90	01:35:00	15.9	5.1	87.0	13.6
26 Oct 90	01:36:00	13.9	5.2	87.9	13.5
26 Oct 90	01:37:00	13.5	5.4	85.9	13.3
26 Oct 90	01:38:00	16.3	5.4	86.7	13.3
26 Oct 90	01:39:00	13.0	5.6	85.2	13.2
26 Oct 90	01:40:00	10.5	5.4	88.5	13.4
26 Oct 90	01:41:00	16.0	5.0	89.4	13.7
26 Oct 90	01:42:00	16.9	5.2	87.3	13.5
26 Oct 90	01:43:00	13.8	5.1	88.2	13.6
26 Oct 90	01:44:00	38.4	4.1	92.6	14.5
26 Oct 90	01:45:00	120.0	3.4	93.2	15.2
26 Oct 90	01:46:00	234.7	3.0	93.9	15.6
26 Oct 90	01:47:00	454.5	2.8	93.8	15.7
26 Oct 90	01:48:00	OFF SCALE	3.6	94.1	14.9
26 Oct 90	01:49:00		3.4	94.9	15.2
26 Oct 90	01:50:00		2.6	94.0	16.0
26 Oct 90	01:51:00	547.1	2.8	93.1	15.7
26 Oct 90	01:52:00	231.4	3.6	93.2	14.9
26 Oct 90	01:53:00	102.5	3.7	93.7	14.8
26 Oct 90	01:54:00	89.7	3.9	90.3	14.5
26 Oct 90	01:55:00	65.1	4.1	90.1	14.4
26 Oct 90	01:56:00	51.6	4.1	90.2	14.4
26 Oct 90	01:57:00	58.4	4.2	90.8	14.4

26 Oct 90	01:58:00	58.3	4.2	91.4	14.3
26 Oct 90	01:59:00	47.8	4.2	91.0	14.3
26 Oct 90	02:00:00	51.3	4.4	89.8	14.2
26 Oct 90	02:01:00	29.3	4.6	90.1	14.0
26 Oct 90	02:02:00	31.4	4.6	89.9	14.0
26 Oct 90	02:03:00	30.0	4.6	89.9	14.0
26 Oct 90	02:04:00	29.1	4.6	90.2	14.0
26 Oct 90	02:05:00	29.0	4.6	89.5	14.0
26 Oct 90	02:06:00	60.5	4.6	89.4	14.0
26 Oct 90	02:07:00	31.9	4.6	89.5	14.0
26 Oct 90	02:08:00	32.4	4.6	89.4	14.0
26 Oct 90	02:09:00	30.9	4.6	89.1	14.0
26 Oct 90	02:10:00	31.0	4.6	89.5	14.0
26 Oct 90	02:11:00	36.8	4.6	88.1	14.0
26 Oct 90	02:12:00	37.8	4.4	89.8	14.2
26 Oct 90	02:13:00	41.7	4.3	91.1	14.3
26 Oct 90	02:14:00	47.7	4.4	90.1	14.1
26 Oct 90	02:15:00	43.3	4.6	88.4	14.0
26 Oct 90	02:16:00	29.4	4.7	89.1	13.9
26 Oct 90	02:17:00	24.6	4.8	88.3	13.8
26 Oct 90	02:18:00	30.3	4.8	87.0	13.8
26 Oct 90	02:19:00	24.9	4.8	87.2	13.8
26 Oct 90	02:20:00	44.6	4.8	87.6	13.8
26 Oct 90	02:21:00	34.5	4.8	87.8	13.8
26 Oct 90	02:22:00	27.9	4.8	87.9	13.8
26 Oct 90	02:23:00	30.6	4.8	87.7	13.8
26 Oct 90	02:24:00	24.2	4.8	87.3	13.8
26 Oct 90	02:25:00	24.9	4.9	87.5	13.8
26 Oct 90	02:26:00	31.8	4.8	87.0	13.8
26 Oct 90	02:27:00	21.2	4.8	89.3	13.8
26 Oct 90	02:28:00	21.5	4.8	89.4	13.8
26 Oct 90	02:29:00	26.7	4.8	88.8	13.8
26 Oct 90	02:30:00	24.7	4.8	88.1	13.8
26 Oct 90	02:31:00	24.6	4.8	88.6	13.8
26 Oct 90	02:32:00	22.9	4.8	88.3	13.8
26 Oct 90	02:33:00	25.8	4.8	88.9	13.8
26 Oct 90	02:34:00	27.1	4.8	89.4	13.8
26 Oct 90	02:35:00	19.5	4.8	89.6	13.8
26 Oct 90	02:36:00	22.7	4.8	88.7	13.8
26 Oct 90	02:37:00	24.6	4.8	88.4	13.8
26 Oct 90	02:38:00	26.0	4.9	86.9	13.7
26 Oct 90	02:39:00	16.7	5.1	86.1	13.5
26 Oct 90	02:40:00	18.5	5.2	85.7	13.5
26 Oct 90	02:41:00	24.0	5.0	87.5	13.7
26 Oct 90	02:42:00	22.0	5.0	86.7	13.6
26 Oct 90	02:43:00	25.8	5.0	87.5	13.6
26 Oct 90	02:44:00	21.3	5.1	87.4	13.6
26 Oct 90	02:45:00	31.5	5.1	86.2	13.6
26 Oct 90	02:46:00	27.8	5.1	86.0	13.5
26 Oct 90	02:47:00	27.5	5.2	85.8	13.5
26 Oct 90	02:48:00	45.6	5.2	84.1	13.5
26 Oct 90	02:49:00	25.4	5.2	84.4	13.5
26 Oct 90	02:50:00	19.9	5.2	86.2	13.4
26 Oct 90	02:51:00	19.5	5.2	87.6	13.5
26 Oct 90	02:52:00	21.4	5.2	87.3	13.5
26 Oct 90	02:53:00	17.6	5.2	86.3	13.5
26 Oct 90	02:54:00	18.0	5.2	87.9	13.5
26 Oct 90	02:55:00	21.9	5.2	86.0	13.4
26 Oct 90	02:56:00	21.8	5.2	86.7	13.5
26 Oct 90	02:57:00	19.2	5.2	85.0	13.5
26 Oct 90	02:58:00	19.5	5.2	86.3	13.5
26 Oct 90	02:59:00	15.1	5.2	86.3	13.5
26 Oct 90	03:00:00	14.6	5.2	86.6	13.5
26 Oct 90	03:01:00	16.0	5.3	86.9	13.4
26 Oct 90	03:02:00	16.5	5.3	86.8	13.4
26 Oct 90	03:03:00	16.7	5.3	85.3	13.4
26 Oct 90	03:04:00	16.5	5.3	85.6	13.4
26 Oct 90	03:05:00	14.8	5.3	86.8	13.4
26 Oct 90	03:06:00	16.7	5.3	85.3	13.4
26 Oct 90	03:07:00	15.5	5.3	85.5	13.4
26 Oct 90	03:08:00	16.5	5.3	86.5	13.4
26 Oct 90	03:09:00	18.2	5.2	85.4	13.5
26 Oct 90	03:10:00	21.4	5.1	87.3	13.6
26 Oct 90	03:11:00	27.1	5.1	85.6	13.5
26 Oct 90	03:12:00	40.3	5.2	85.3	13.5
26 Oct 90	03:13:00	27.1	5.1	86.2	13.5
26 Oct 90	03:14:00	33.0	5.2	86.0	13.4
26 Oct 90	03:15:00	41.9	5.3	85.8	13.5
26 Oct 90	03:16:00	91.2	5.2	83.7	13.4

FLAMEOUT					
26 Oct 90	03:30:00	42.3	6.6	78.5	12.1
26 Oct 90	03:31:00	26.2	6.2	81.2	12.5
26 Oct 90	03:32:00	20.1	6.4	79.9	12.3
26 Oct 90	03:33:00	16.5	6.6	79.2	12.1
26 Oct 90	03:34:00	17.1	6.8	78.2	11.9
26 Oct 90	03:35:00	16.7	6.9	77.8	11.9
26 Oct 90	03:36:00	17.1	7.1	75.8	11.7
26 Oct 90	03:37:00	17.8	6.8	78.0	11.9
26 Oct 90	03:38:00	12.8	5.3	85.1	13.4
26 Oct 90	03:39:00	16.6	4.4	87.5	14.1
26 Oct 90	03:40:00	26.2	3.9	88.5	14.5
26 Oct 90	03:41:00	35.0	3.7	88.6	14.7
26 Oct 90	03:42:00	39.5	3.5	88.1	14.9
26 Oct 90	03:43:00	51.1	3.4	88.3	15.1
26 Oct 90	03:44:00	62.2	3.2	89.2	15.2
26 Oct 90	03:45:00	71.4	3.2	88.4	15.2
26 Oct 90	03:46:00	81.7	3.4	89.7	14.9
26 Oct 90	03:47:00	47.9	3.5	88.9	14.8
26 Oct 90	03:48:00	60.6	3.5	90.6	14.8
26 Oct 90	03:49:00	56.3	3.5	88.5	14.9
26 Oct 90	03:50:00	68.1	3.4	88.3	15.0
26 Oct 90	03:51:00	54.1	3.4	89.3	14.9
26 Oct 90	03:52:00	55.8	3.4	88.6	15.0
26 Oct 90	03:53:00	65.1	3.5	90.3	14.9
26 Oct 90	03:54:00	62.4	3.5	89.0	14.9
26 Oct 90	03:55:00	127.3	3.2	89.5	15.2
26 Oct 90	03:56:00	177.7	3.2	89.0	15.2
26 Oct 90	03:57:00	79.8	3.4	89.0	15.0
26 Oct 90	03:57:00	90.2	3.5	88.2	14.9
26 Oct 90	03:59:00	70.7	3.4	88.9	15.0
26 Oct 90	04:00:00	106.2	3.1	91.1	15.3
26 Oct 90	04:01:00	109.5	3.1	88.9	15.3
26 Oct 90	04:02:00	106.3	3.1	91.2	15.2
26 Oct 90	04:03:00	104.4	3.2	89.2	15.2
26 Oct 90	04:04:00	103.2	3.1	91.2	15.2
26 Oct 90	04:05:00	94.2	3.2	92.1	15.2
26 Oct 90	04:06:00	96.6	3.1	89.5	15.3
26 Oct 90	04:07:00	132.8	2.9	90.3	15.5
26 Oct 90	04:08:00	153.1	3.0	90.7	15.4
26 Oct 90	04:09:00	168.0	3.0	88.8	15.4
26 Oct 90	04:10:00	124.8	3.0	89.2	15.4
26 Oct 90	04:11:00	151.5	3.0	87.5	15.4
26 Oct 90	04:12:00	242.7	3.0	87.1	15.3
26 Oct 90	04:13:00	208.9	3.1	88.6	15.3
26 Oct 90	04:14:00	200.5	3.2	88.4	15.2
26 Oct 90	04:15:00	168.7	3.2	87.4	15.1
26 Oct 90	04:16:00	138.7	3.2	88.7	15.1
26 Oct 90	04:17:00	147.0	3.3	89.5	15.1
26 Oct 90	04:18:00	123.5	3.3	89.3	15.1
26 Oct 90	04:19:00	95.2	3.3	90.1	15.1
26 Oct 90	04:20:00	115.7	3.3	89.4	15.1
26 Oct 90	04:21:00	93.8	3.3	89.7	15.1
26 Oct 90	04:22:00	97.9	3.3	90.2	15.1
26 Oct 90	04:23:00	87.5	3.2	89.9	15.1
26 Oct 90	04:24:00	66.0	3.4	89.7	15.0
26 Oct 90	04:25:00	67.0	3.3	89.5	15.0
26 Oct 90	04:26:00	100.3	3.2	90.1	15.1
26 Oct 90	04:27:00	92.7	3.2	90.4	15.2
26 Oct 90	04:28:00	79.2	3.2	89.9	15.1
26 Oct 90	04:29:00	78.7	3.6	89.6	14.8
26 Oct 90	04:30:00	101.3	3.2	89.9	15.2
26 Oct 90	04:31:00	111.0	3.1	90.0	15.3
26 Oct 90	04:32:00	109.4	3.2	90.0	15.2
26 Oct 90	04:33:00	140.1	3.2	88.8	15.3
26 Oct 90	04:34:00	120.1	3.2	89.9	15.2
26 Oct 90	04:35:00	133.7	3.0	91.2	15.4
26 Oct 90	04:36:00	137.9	2.9	90.4	15.5
26 Oct 90	04:37:00	132.5	3.1	90.7	15.4
26 Oct 90	04:38:00	98.4	3.3	91.3	15.1
26 Oct 90	04:39:00	116.5	3.2	90.3	15.2
26 Oct 90	04:40:00	161.5	3.3	89.9	15.1
26 Oct 90	04:41:00	147.9	3.3	88.9	15.1
26 Oct 90	04:42:00	219.7	5.5	65.5	12.4
FLAMEOUT					
26 Oct 90	04:50:00	247.1	0.3	66.6	16.7
26 Oct 90	04:51:00	361.6	0.5	67.4	16.7
26 Oct 90	04:52:00	271.9	2.3	80.2	15.6
26 Oct 90	04:53:00	299.4	5.1	86.5	13.4

26 Oct 90	04:54:00	29.3	5.1		87.4	13.5
26 Oct 90	04:55:00	22.7	5.5		85.6	13.1
26 Oct 90	04:56:00	20.8	5.7		86.9	13.0
26 Oct 90	04:57:00	20.5	5.4		89.4	13.3
26 Oct 90	04:58:00	18.8	5.4		90.9	13.3
26 Oct 90	04:59:00	19.0	5.1		91.2	13.6
26 Oct 90	05:00:00	22.1	5.0		91.6	13.7
26 Oct 90	05:01:00	21.5	5.0		92.1	13.6
26 Oct 90	05:02:00	29.3	4.5		92.4	14.1
FLAMEOUT						
26 Oct 90	05:10:00	352.5	5.0		67.1	13.5
26 Oct 90	05:11:00	156.4	3.4		68.1	14.7
26 Oct 90	05:12:00	107.1	3.6		69.5	14.4
26 Oct 90	05:13:00	89.1	3.9		69.7	14.3
26 Oct 90	05:14:00	100.8	3.6		70.4	14.4
26 Oct 90	05:15:00	89.4	3.7		70.8	14.4
26 Oct 90	05:16:00	70.6	3.8		71.4	14.3
26 Oct 90	05:17:00	64.9	3.9		71.5	14.2
26 Oct 90	05:18:00	54.8	4.0		71.9	14.1
26 Oct 90	05:19:00	188.1	3.4		72.5	14.7
26 Oct 90	05:20:00	935.5	2.5		71.2	15.5
26 Oct 90	05:21:00	587.2	3.1		71.8	14.9
26 Oct 90	05:22:00	225.7	3.2		72.2	14.8
26 Oct 90	05:23:00	524.2	4.0		74.7	14.1
26 Oct 90	05:24:00	358.4	5.0		76.3	13.2
26 Oct 90	05:25:00	19.4	5.9		74.8	12.5
26 Oct 90	05:26:00	20.5	6.2		74.6	12.2
26 Oct 90	05:27:00	24.5	6.7		73.0	11.8
26 Oct 90	05:28:00	32.0	7.1		73.6	11.4
26 Oct 90	05:29:00	27.3	6.1		73.5	12.4
26 Oct 90	05:30:00	21.7	6.3		74.2	12.2
26 Oct 90	05:31:00	21.3	5.6		74.6	12.8
26 Oct 90	05:32:00	22.2	4.7		75.8	13.6
26 Oct 90	05:33:00	78.5	3.4		75.7	14.9
26 Oct 90	05:34:00	137.8	2.9		76.1	15.3
26 Oct 90	05:35:00	182.7	2.7		76.8	15.5
26 Oct 90	05:36:00	134.0	2.9		77.0	15.3
26 Oct 90	05:37:00	142.9	3.1		76.1	15.1
26 Oct 90	05:38:00	111.5	3.1		76.8	15.0
26 Oct 90	05:39:00	50.1	4.3		75.9	13.9
26 Oct 90	05:40:00	293.8	2.9		76.6	15.3
26 Oct 90	05:41:00	61.9	4.5		76.3	13.6
26 Oct 90	05:42:00	36.5	4.8		77.1	13.5
26 Oct 90	05:43:00	67.6	4.0		77.0	14.3
26 Oct 90	05:44:00	729.5	2.6		76.8	15.6
26 Oct 90	05:45:00	187.9	6.8		68.9	11.3
26 Oct 90	05:46:00	216.7	10.5		60.5	8.1
26 Oct 90	05:47:00	279.3	10.6		61.1	8.1
26 Oct 90	05:48:00	149.0	9.6		67.2	9.0
26 Oct 90	05:49:00	119.3	9.2		70.1	9.5
26 Oct 90	05:50:00	511.3	8.4		69.3	10.0
26 Oct 90	05:51:00	150.2	16.4		4.5	1.6
	AVERAGE	68.4	5.1	3.0	81.6	13.4
SPAN GAS VALUE		255.0	6.0	25.0	250.0	5.0
AVERAGE BIAS ZERO		1.0	0.0	0.9	0.0	0.0
AVERAGE BIAS SPAN		257.0	5.9	25.0	245.0	5.3
BIAS CORRECTED AVG		67.1	5.2	2.2	83.3	12.6

30 Nov 90	16:38:00	63.2	7.8	80.2	10.0
30 Nov 90	16:39:00	57.0	7.8	79.5	10.0
30 Nov 90	16:40:00	69.2	7.8	80.0	10.0
30 Nov 90	16:41:00	62.1	7.8	80.2	10.0
30 Nov 90	16:42:00	74.1	7.7	80.6	10.0
30 Nov 90	16:43:00	94.2	8.0	77.1	9.7
30 Nov 90	16:44:00	250.2	2.5	80.6	11.4
30 Nov 90	16:45:00	0.9	-0.1	71.3	10.0
30 Nov 90	16:46:00	1.2	0.0	83.1	9.7
30 Nov 90	16:47:00	1.6	0.2	100.1	10.6
30 Nov 90	16:48:00	64.2	1.5	132.0	14.3
30 Nov 90	16:49:00	277.4	0.9	118.3	14.1
30 Nov 90	16:50:00	243.3	3.1	131.7	13.8
30 Nov 90	16:51:00	787.5	4.1	131.3	13.0
30 Nov 90	16:52:00	219.2	4.8	131.8	12.6
30 Nov 90	16:53:00	149.6	5.0	130.6	12.5
30 Nov 90	16:54:00	143.6	5.0	129.5	12.5
30 Nov 90	16:55:00	144.7	5.0	130.2	12.4
30 Nov 90	16:56:00	110.6	5.2	129.7	12.2
30 Nov 90	16:57:00	82.5	6.1	126.8	11.4
30 Nov 90	16:58:00	62.3	6.4	126.2	11.2
30 Nov 90	16:59:00	59.9	6.3	127.5	11.4
30 Nov 90	17:00:00	57.6	6.2	130.3	11.4
30 Nov 90	17:01:00	56.6	6.2	130.0	11.4
30 Nov 90	17:02:00	56.1	6.1	129.8	11.5
30 Nov 90	17:03:00	58.3	6.2	128.5	11.4
30 Nov 90	17:04:00	57.1	6.2	128.9	11.5
30 Nov 90	17:05:00	56.1	5.9	131.0	11.7
30 Nov 90	17:06:00	460.9	3.5	123.4	13.7
30 Nov 90	17:07:00	178.1	1.7	125.6	14.4
30 Nov 90	17:08:00	546.0	2.5	133.1	14.2
30 Nov 90	17:09:00	66.3	2.7	132.7	14.1
30 Nov 90	17:10:00	802.9	3.2	136.1	13.8
30 Nov 90	17:11:00	960.2	3.7	135.6	13.3
30 Nov 90	17:12:00	403.3	4.6	135.7	12.8
30 Nov 90	17:13:00	186.8	4.7	134.7	12.7
30 Nov 90	17:14:00	177.4	4.9	134.9	12.4
30 Nov 90	17:15:00	94.9	5.5	132.8	11.9
30 Nov 90	17:16:00	62.0	6.3	129.4	11.3
30 Nov 90	17:17:00	602.5	2.3	117.0	14.3
30 Nov 90	17:18:00	68.0	2.1	126.6	14.2
30 Nov 90	17:19:00	584.9	2.5	129.1	14.1
30 Nov 90	17:20:00	450.3	3.1	130.8	13.9
30 Nov 90	17:21:00	740.2	1.4	111.8	14.4
30 Nov 90	17:22:00	1000.0	1.8	125.9	14.1
30 Nov 90	17:23:00	574.3	4.7	144.3	12.5
30 Nov 90	17:24:00	89.2	5.5	144.7	12.0
30 Nov 90	17:25:00	63.1	5.7	147.3	11.9
	AVERAGE	299.6	4.9	127.8	11.8
	SPAN GAS VALUE	255.0	6.0	803.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	0.0	0.0
	AVERAGE BIAS SPAN	259.0	5.8	800.5	5.1
	BIAS CORRECTED AVG	295.1	5.0	128.2	11.5

25 Oct 90	17:19:00	44.2	6.5	0.8	50.4	11.8
25 Oct 90	17:20:00	46.6	6.7	0.9	49.1	11.6
25 Oct 90	17:21:00	47.7	6.7	0.8	49.3	11.6
25 Oct 90	17:22:00	47.2	6.7	0.9	49.5	11.7
25 Oct 90	17:23:00	49.2	6.6	0.8	49.6	11.7
25 Oct 90	17:24:00	48.2	6.5	0.8	50.2	11.8
25 Oct 90	17:25:00	49.2	6.6	0.9	49.6	11.7
25 Oct 90	17:26:00	53.1	6.7	0.8	49.9	11.7
25 Oct 90	17:27:00	46.2	6.7	0.8	49.9	11.7
	AVERAGE	49.6	6.6	1.1	50.1	11.8
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	0.0	0.0	0.4	-0.1	0.0
	AVERAGE BIAS SPAN	255.5	6.0	26.9	244.5	5.1
	BIAS CORRECTED AVG	49.5	6.6	0.7	51.3	11.6

TEST T-5

1 NOVEMBER 1990

TEST NUMBER 5-3.6 POUNDS OF TNT
NOTE : ACETONE

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
1 Nov 90	07:29:00	8.9	6.0	0.5	109.0	11.5
1 Nov 90	07:30:00	8.2	6.1	0.4	109.5	11.3
1 Nov 90	07:31:00	9.1	5.5	0.4	111.8	11.8
1 Nov 90	07:32:00	8.9	6.0	0.3	108.4	11.3
1 Nov 90	07:33:00	14.5	3.8	0.4	121.8	13.1
1 Nov 90	07:34:00	15.6	4.3	0.4	117.6	12.9
1 Nov 90	07:35:00	11.7	6.1	0.2	104.8	11.5
1 Nov 90	07:36:00	8.9	6.7	0.2	103.6	10.7
1 Nov 90	07:37:00	13.5	4.8	0.3	114.4	12.1
1 Nov 90	07:38:00	21.4	3.9	0.3	119.9	13.2
1 Nov 90	07:39:00	13.8	4.4	0.3	118.5	12.8
1 Nov 90	07:40:00	12.4	4.7	0.9	117.0	12.5
1 Nov 90	07:41:00	11.6	4.8	0.7	115.8	12.4
1 Nov 90	07:42:00	11.0	5.0	0.7	116.0	12.3
1 Nov 90	07:43:00	9.2	5.8	0.6	111.5	11.6
1 Nov 90	07:44:00	8.6	5.9	0.8	111.2	11.4
1 Nov 90	07:45:00	9.5	5.4	0.7	111.5	11.9
1 Nov 90	07:46:00	9.2	5.4	0.6	110.3	11.8
1 Nov 90	07:47:00	9.7	5.4	0.5	112.9	11.9
1 Nov 90	07:48:00	8.9	6.3	0.4	105.7	11.2
1 Nov 90	07:49:00	8.4	5.9	0.4	110.1	11.4
1 Nov 90	07:50:00	8.9	5.9	0.3	107.9	11.5
1 Nov 90	07:51:00	8.0	6.2	0.3	109.5	11.2
1 Nov 90	07:52:00	8.0	6.1	0.3	108.7	11.3
1 Nov 90	07:53:00	8.3	5.8	0.3	108.5	11.6
1 Nov 90	07:54:00	8.9	5.6	0.3	110.3	11.7
1 Nov 90	07:55:00	8.7	5.9	0.3	107.6	11.5
1 Nov 90	07:56:00	8.0	5.9	0.3	110.6	11.5
1 Nov 90	07:57:00	8.0	5.7	0.2	109.0	11.6
1 Nov 90	07:58:00	8.6	5.7	0.2	108.6	11.7
1 Nov 90	07:59:00	9.6	5.5	0.2	108.8	11.9
1 Nov 90	08:00:00	9.0	5.7	0.2	109.8	11.6
1 Nov 90	08:01:00	9.1	5.8	0.3	107.3	11.6
1 Nov 90	08:02:00	9.4	5.2	0.4	111.7	12.0
1 Nov 90	08:03:00	9.9	5.6	0.3	108.5	11.8
1 Nov 90	08:04:00	8.7	5.9	0.3	107.2	11.4
1 Nov 90	08:05:00	8.7	5.7	0.3	107.9	11.7
1 Nov 90	08:06:00	8.6	5.9	0.2	108.9	11.5
1 Nov 90	08:07:00	9.3	5.3	0.2	110.5	12.0
1 Nov 90	08:08:00	9.4	5.6	0.2	109.2	11.8
1 Nov 90	08:09:00	9.2	5.6	0.2	110.0	11.7
1 Nov 90	08:10:00	9.4	5.3	0.2	108.9	12.0
1 Nov 90	08:11:00	10.4	5.0	0.2	112.4	12.2
1 Nov 90	08:12:00	11.2	4.9	0.2	115.3	12.3
1 Nov 90	08:13:00	16.9	4.3	0.2	113.1	12.8
1 Nov 90	08:14:00	11.3	4.9	0.2	115.1	12.3
1 Nov 90	08:15:00	11.7	5.0	0.2	112.6	12.3
1 Nov 90	08:16:00	12.1	5.0	0.2	110.4	12.3
1 Nov 90	08:17:00	38.0	3.8	0.3	115.2	13.2
1 Nov 90	08:18:00	34.2	5.0	0.2	112.7	12.3
1 Nov 90	08:19:00	16.6	5.3	0.2	107.5	12.0
1 Nov 90	08:20:00	12.5	4.7	0.2	115.2	12.5
1 Nov 90	08:21:00	11.9	5.1	0.2	110.2	12.1
1 Nov 90	08:22:00	9.9	5.3	0.2	111.0	12.0
1 Nov 90	08:23:00	9.5	5.2	0.2	111.8	12.0
1 Nov 90	08:24:00	9.3	5.2	0.2	114.6	12.1
1 Nov 90	08:25:00	9.6	5.3	0.2	113.9	12.0
1 Nov 90	08:26:00	10.9	5.1	0.2	110.9	12.2
1 Nov 90	08:27:00	10.8	4.9	0.2	113.8	12.4
1 Nov 90	08:28:00	12.8	4.5	0.2	113.6	12.7
1 Nov 90	08:29:00	25.2	3.7	0.3	115.6	13.3
1 Nov 90	08:30:00	45.9	2.9	0.3	120.3	13.9
1 Nov 90	08:31:00	27.7	3.6	0.2	118.5	13.4
1 Nov 90	08:32:00	17.1	3.9	0.2	118.4	13.1
1 Nov 90	08:33:00	12.5	4.8	0.2	111.0	12.4
1 Nov 90	08:34:00	12.7	4.5	0.2	114.7	12.6
1 Nov 90	08:35:00	14.0	4.4	0.2	114.8	12.7
1 Nov 90	08:36:00	10.2	5.4	0.2	108.3	11.9
1 Nov 90	08:37:00	8.4	5.9	0.2	105.1	11.5
1 Nov 90	08:38:00	8.0	6.2	0.1	105.1	11.3
1 Nov 90	08:39:00	8.5	5.7	0.1	107.7	11.7
1 Nov 90	08:40:00	8.1	5.8	0.1	108.6	11.6

1 Nov 90	08:41:00	8.3	5.7	0.1	110.2	11.7
1 Nov 90	08:42:00	8.0	5.5	0.1	109.7	11.8
1 Nov 90	08:43:00	8.0	5.7	0.1	108.3	11.6
1 Nov 90	08:44:00	8.0	5.5	0.1	110.3	11.9
1 Nov 90	08:45:00	8.9	5.5	0.1	107.4	11.8
1 Nov 90	08:46:00	8.1	5.8	0.1	108.0	11.6
1 Nov 90	08:47:00	8.0	5.6	0.1	109.3	11.7
1 Nov 90	08:48:00	10.5	4.8	0.2	117.4	12.5
1 Nov 90	08:49:00	36.0	2.9	0.2	120.6	14.0
1 Nov 90	08:50:00	51.8	2.7	0.2	120.1	14.1
1 Nov 90	08:51:00	53.0	2.6	0.2	119.6	14.2
1 Nov 90	08:52:00	34.4	3.8	0.2	115.9	13.2
1 Nov 90	08:53:00	12.4	4.7	0.1	115.6	12.5
1 Nov 90	08:54:00	11.1	4.8	0.1	113.2	12.4
1 Nov 90	08:55:00	10.1	4.9	0.1	116.4	12.4
1 Nov 90	08:56:00	9.5	5.2	0.1	112.3	12.1
1 Nov 90	08:57:00	11.1	4.7	0.1	115.8	12.5
1 Nov 90	08:58:00	12.5	4.6	0.1	113.7	12.6
1 Nov 90	08:59:00	12.8	4.8	0.1	110.8	12.4
1 Nov 90	09:00:00	9.6	5.6	0.1	110.5	11.8
1 Nov 90	09:01:00	9.2	4.9	0.1	115.3	12.3
1 Nov 90	09:02:00	9.4	5.3	0.1	110.3	11.9
1 Nov 90	09:03:00	8.9	5.5	0.1	111.3	11.8
1 Nov 90	09:04:00	8.8	5.3	0.1	112.8	12.0
1 Nov 90	09:05:00	9.4	5.0	0.1	114.0	12.3
1 Nov 90	09:06:00	12.2	4.5	0.1	116.0	12.7
1 Nov 90	09:07:00	14.0	4.1	0.1	116.7	13.0
1 Nov 90	09:08:00	17.1	4.0	0.1	116.8	13.1
1 Nov 90	09:09:00	13.5	4.4	0.1	114.4	12.7
1 Nov 90	09:10:00	12.8	4.7	0.1	113.7	12.5
1 Nov 90	09:11:00	11.0	5.1	0.1	109.5	12.1
1 Nov 90	09:12:00	20.5	3.8	0.1	118.0	13.3
1 Nov 90	09:13:00	18.2	4.2	0.1	117.0	12.9
1 Nov 90	09:14:00	13.7	4.3	0.1	116.3	12.9
1 Nov 90	09:15:00	16.6	4.2	0.1	115.2	13.0
1 Nov 90	09:16:00	16.4	4.0	0.1	118.9	13.1
1 Nov 90	09:17:00	14.3	4.0	0.2	118.3	13.0
1 Nov 90	09:18:00	14.9	4.2	0.3	117.0	12.9
1 Nov 90	09:19:00	15.7	4.1	0.4	116.4	13.0
1 Nov 90	09:20:00	18.0	4.6	0.5	111.1	12.6
1 Nov 90	09:21:00	30.8	3.4	0.5	118.8	13.5
1 Nov 90	09:22:00	16.8	4.0	0.4	117.7	13.0
1 Nov 90	09:23:00	13.8	4.3	0.4	116.7	12.8
1 Nov 90	09:24:00	14.9	4.1	0.4	116.5	13.0
1 Nov 90	09:25:00	13.9	4.4	0.3	114.7	12.7
1 Nov 90	09:26:00	10.9	5.4	0.2	110.0	11.9
1 Nov 90	09:27:00	160.3	2.7	1.0	115.7	14.2
1 Nov 90	09:28:00	951.0	1.0	6.4	107.1	15.6
1 Nov 90	09:29:00	951.0	1.0	0.9	113.5	15.5
1 Nov 90	09:30:00	563.7	1.4	0.5	114.6	15.1
1 Nov 90	09:31:00	294.8	1.9	0.3	116.2	14.7
1 Nov 90	09:32:00	100.6	2.7	0.3	122.4	14.1
1 Nov 90	09:33:00	29.6	3.5	0.2	118.8	13.4
1 Nov 90	09:34:00	10.7	4.9	0.2	112.1	12.4
1 Nov 90	09:35:00	8.6	5.2	0.1	110.6	12.1
1 Nov 90	09:36:00	8.2	5.0	0.1	109.7	12.3
1 Nov 90	09:37:00	10.3	4.6	0.1	110.4	12.6
1 Nov 90	09:38:00	10.2	4.7	0.1	113.8	12.6
1 Nov 90	09:39:00	10.1	4.5	0.1	112.8	12.8
1 Nov 90	09:40:00	11.0	4.3	0.1	112.2	12.8
1 Nov 90	09:41:00	10.8	4.7	0.1	110.1	12.6
1 Nov 90	09:42:00	8.3	5.0	0.0	110.4	12.3
1 Nov 90	09:43:00	9.1	4.7	0.1	111.4	12.5
1 Nov 90	09:44:00	9.9	4.9	0.0	108.8	12.4
1 Nov 90	09:45:00	8.9	5.1	0.0	108.1	12.2
1 Nov 90	09:46:00	74.7	5.5	1.9	97.6	11.9
1 Nov 90	09:47:00	108.4	2.6	0.1	112.0	14.2
1 Nov 90	09:48:00	24.1	3.5	0.1	115.8	13.5
1 Nov 90	09:49:00	12.8	4.4	0.0	108.5	12.7
1 Nov 90	09:50:00	7.5	5.8	0.0	104.8	11.6
1 Nov 90	09:51:00	7.8	5.0	0.0	109.3	12.3
1 Nov 90	09:52:00	8.9	4.8	0.0	109.0	12.4
1 Nov 90	09:53:00	8.1	5.2	0.0	109.1	12.1
1 Nov 90	09:54:00	8.1	5.0	0.0	109.2	12.3
1 Nov 90	09:55:00	8.0	5.2	0.0	108.3	12.2
1 Nov 90	09:56:00	7.5	5.2	0.0	106.4	12.1
1 Nov 90	09:57:00	8.7	4.7	0.0	109.5	12.5
1 Nov 90	09:58:00	9.1	4.8	0.0	108.4	12.4
1 Nov 90	09:59:00	10.9	4.3	0.0	112.7	12.9

1 Nov 90	10:00:00	11.5	4.7	0.0	110.3	12.6
1 Nov 90	10:01:00	8.3	4.9	0.0	110.5	12.4
1 Nov 90	10:02:00	8.9	4.8	0.0	107.7	12.5
1 Nov 90	10:03:00	10.1	4.7	0.0	109.7	12.6
1 Nov 90	10:04:00	9.7	4.9	0.0	107.6	12.4
1 Nov 90	10:05:00	8.0	4.9	0.0	110.8	12.4
1 Nov 90	10:06:00	8.0	4.8	0.0	110.2	12.5
1 Nov 90	10:07:00	8.0	4.9	0.0	110.4	12.4
1 Nov 90	10:08:00	9.4	4.7	-0.0	110.5	12.5
1 Nov 90	10:09:00	7.2	5.2	0.0	109.1	12.1
1 Nov 90	10:10:00	8.0	5.0	0.0	109.9	12.3
1 Nov 90	10:11:00	8.6	4.9	-0.0	108.5	12.3
1 Nov 90	10:12:00	8.1	5.0	0.0	108.5	12.3
1 Nov 90	10:13:00	8.2	4.9	0.0	108.4	12.4
1 Nov 90	10:14:00	9.0	4.6	0.0	111.2	12.6
1 Nov 90	10:15:00	11.0	4.5	-0.0	107.8	12.7
1 Nov 90	10:16:00	10.4	4.7	1.8	105.9	12.6
1 Nov 90	10:17:00	87.8	6.4	1.4	98.7	11.1
1 Nov 90	10:18:00	22.0	3.6	0.1	112.7	13.5
1 Nov 90	10:19:00	14.3	4.5	0.0	110.8	12.7
1 Nov 90	10:20:00	8.8	5.0	0.0	110.7	12.3
1 Nov 90	10:21:00	10.5	4.4	0.0	111.5	12.8
1 Nov 90	10:22:00	11.4	4.4	0.0	110.8	12.8
1 Nov 90	10:23:00	11.7	4.3	0.0	108.8	12.9
1 Nov 90	10:24:00	11.5	4.4	0.0	111.0	12.8
1 Nov 90	10:25:00	10.7	4.4	0.0	109.4	12.8
1 Nov 90	10:26:00	10.8	4.4	0.0	110.1	12.8
1 Nov 90	10:27:00	14.2	4.0	0.0	111.4	13.2
1 Nov 90	10:28:00	14.9	3.9	0.1	110.9	13.2
1 Nov 90	10:29:00	16.1	3.9	0.1	111.2	13.2
1 Nov 90	10:30:00	15.3	3.9	0.1	113.3	13.2
1 Nov 90	10:31:00	11.9	4.4	0.0	110.6	12.8
1 Nov 90	10:32:00	10.8	4.3	0.0	110.9	12.8
1 Nov 90	10:33:00	12.7	4.1	0.0	111.0	13.0
1 Nov 90	10:34:00	12.4	4.2	0.0	111.0	12.9
1 Nov 90	10:35:00	11.0	4.4	0.0	110.9	12.8
1 Nov 90	10:36:00	11.2	4.4	0.0	111.7	12.7
1 Nov 90	10:37:00	12.1	4.1	0.1	111.1	13.1
1 Nov 90	10:38:00	12.4	4.3	0.0	111.2	12.8
1 Nov 90	10:39:00	10.4	4.5	0.1	108.7	12.7
1 Nov 90	10:40:00	12.8	4.1	0.1	112.2	13.1
1 Nov 90	10:41:00	12.9	4.2	0.0	108.7	13.0
1 Nov 90	10:42:00	10.6	4.5	0.0	113.1	12.7
1 Nov 90	10:43:00	9.7	4.6	0.0	110.9	12.7
1 Nov 90	10:44:00	8.6	4.7	0.0	111.5	12.5
1 Nov 90	10:45:00	9.6	4.6	0.0	110.9	12.6
1 Nov 90	10:46:00	8.6	4.6	0.0	108.9	12.6
1 Nov 90	10:47:00	10.5	4.6	0.0	109.1	12.6
1 Nov 90	10:48:00	9.8	4.5	0.0	108.9	12.7
1 Nov 90	10:49:00	9.6	4.8	0.0	109.5	12.5
1 Nov 90	10:50:00	10.5	4.5	0.0	110.9	12.8
1 Nov 90	10:51:00	11.4	4.4	0.0	111.4	12.8
1 Nov 90	10:52:00	11.1	4.4	0.0	108.8	12.8
1 Nov 90	10:53:00	9.7	4.8	0.0	109.5	12.5
1 Nov 90	10:54:00	10.8	4.3	0.0	112.5	12.9
1 Nov 90	10:55:00	16.1	3.9	0.0	111.0	13.2
1 Nov 90	10:56:00	11.1	4.5	0.0	110.0	12.7
1 Nov 90	10:57:00	8.6	4.8	0.0	110.5	12.4
1 Nov 90	10:58:00	12.9	3.9	0.0	114.4	13.2
1 Nov 90	10:59:00	21.9	3.4	0.0	114.2	13.6
1 Nov 90	11:00:00	17.1	4.0	0.0	110.2	13.1
1 Nov 90	11:01:00	9.6	4.7	0.0	108.9	12.6
1 Nov 90	11:02:00	13.6	3.9	0.0	110.6	13.2
1 Nov 90	11:03:00	48.9	5.0	1.6	99.0	12.2
1 Nov 90	11:04:00	628.6	1.8	0.9	104.6	15.0
1 Nov 90	11:05:00	927.5	1.3	1.4	103.3	15.4
1 Nov 90	11:06:00	704.8	1.6	0.5	107.8	15.1
1 Nov 90	11:07:00	491.8	1.7	0.5	108.9	15.0
1 Nov 90	11:08:00	252.5	2.1	0.2	109.5	14.6
1 Nov 90	11:09:00	203.3	2.1	0.2	108.9	14.5
1 Nov 90	11:10:00	139.8	2.4	0.1	111.2	14.3
1 Nov 90	11:11:00	70.7	2.8	0.1	112.5	14.1
1 Nov 90	11:12:00	25.2	3.9	0.1	110.0	13.2
1 Nov 90	11:13:00	11.9	4.3	0.0	108.9	12.9
1 Nov 90	11:14:00	10.1	4.6	0.0	106.1	12.6
1 Nov 90	11:15:00	8.1	5.1	0.0	105.3	12.3
1 Nov 90	11:16:00	7.7	5.2	0.0	103.5	12.2
1 Nov 90	11:17:00	7.3	5.2	0.0	104.9	12.1
1 Nov 90	11:18:00	8.6	4.7	0.0	107.0	12.6

1 Nov 90	11:19:00	11.6	4.4	0.0	107.7	12.8
1 Nov 90	11:20:00	9.1	4.6	0.0	107.4	12.6
1 Nov 90	11:21:00	9.1	4.7	0.0	107.2	12.6
1 Nov 90	11:22:00	8.4	4.8	0.0	108.1	12.5
FLAMEOUT						
1 Nov 90	11:55:00	40.7	5.6	THC	103.9	11.3
1 Nov 90	11:56:00	36.5	5.6	CONTAMINATED	103.5	11.4
1 Nov 90	11:57:00	39.8	5.6	SAMPLE	104.3	11.4
1 Nov 90	11:58:00	37.7	5.6	LINE	104.7	11.4
1 Nov 90	11:59:00	35.2	5.6	DURING	104.7	11.3
1 Nov 90	12:00:00	37.9	5.8	FLAMEOUT	103.2	11.2
1 Nov 90	12:01:00	31.1	6.4		102.2	10.7
1 Nov 90	12:02:00	29.6	6.4		101.9	10.7
1 Nov 90	12:03:00	29.5	6.6		101.7	10.6
1 Nov 90	12:04:00	30.6	6.5		101.5	10.7
1 Nov 90	12:05:00	27.6	6.4		101.2	10.7
1 Nov 90	12:06:00	28.2	6.4		101.5	10.7
1 Nov 90	12:07:00	27.0	6.5		101.4	10.7
1 Nov 90	12:08:00	26.4	6.5		101.8	10.7
1 Nov 90	12:09:00	26.6	6.5		102.1	10.7
1 Nov 90	12:10:00	26.3	6.4		103.3	10.7
1 Nov 90	12:11:00	24.5	6.5		103.0	10.7
1 Nov 90	12:12:00	27.7	6.5		103.0	10.6
1 Nov 90	12:13:00	399.3	2.4		102.7	13.8
1 Nov 90	12:14:00	735.6	4.7		78.5	12.0
1 Nov 90	12:15:00	389.2	9.8		69.9	8.4
1 Nov 90	12:16:00	51.7	9.1		71.0	9.0
1 Nov 90	12:17:00	92.2	9.5		66.9	8.6
1 Nov 90	12:18:00	102.2	9.7		64.9	8.5
1 Nov 90	12:19:00	179.9	9.9		60.7	8.2
1 Nov 90	12:20:00	332.7	10.2		55.4	8.0
1 Nov 90	12:21:00	459.8	10.9		51.3	7.5
1 Nov 90	12:22:00	637.4	2.2		87.4	13.4
1 Nov 90	12:23:00	664.8	3.3		104.7	13.1
1 Nov 90	12:24:00	131.3	5.5		103.3	11.4
1 Nov 90	12:25:00	45.9	6.1		100.7	10.9
1 Nov 90	12:26:00	40.2	7.1		101.3	10.2
1 Nov 90	12:27:00	30.2	5.0		113.9	12.0
1 Nov 90	12:28:00	21.4	5.6		108.7	11.5
1 Nov 90	12:29:00	18.7	5.9		106.1	11.3
1 Nov 90	12:30:00	16.2	6.3		103.4	10.9
1 Nov 90	12:31:00	15.0	6.8		100.3	10.5
1 Nov 90	12:32:00	17.4	7.4		97.2	10.1
1 Nov 90	12:33:00	26.5	7.9		94.6	9.7
1 Nov 90	12:34:00	22.5	6.4		108.7	11.0
1 Nov 90	12:35:00	16.3	5.9		107.7	11.3
1 Nov 90	12:36:00	13.9	6.4		103.3	10.8
1 Nov 90	12:37:00	14.1	6.5		104.8	10.8
1 Nov 90	12:38:00	16.4	7.1		96.0	10.3
1 Nov 90	12:39:00	26.0	8.0		95.1	9.6
1 Nov 90	12:40:00	13.6	7.3		99.3	10.2
1 Nov 90	12:41:00	16.1	7.8		94.6	9.8
1 Nov 90	12:42:00	19.5	7.8		96.6	9.9
1 Nov 90	12:43:00	19.2	7.9		94.5	9.7
1 Nov 90	12:44:00	14.1	7.4		98.0	10.1
1 Nov 90	12:45:00	14.7	5.8		111.4	11.5
1 Nov 90	12:46:00	16.3	5.1		109.7	12.1
1 Nov 90	12:47:00	9.1	6.2		106.5	11.1
1 Nov 90	12:48:00	8.9	6.4		104.0	11.0
1 Nov 90	12:49:00	8.5	6.7		102.1	10.7
1 Nov 90	12:50:00	8.6	7.0		100.6	10.5
1 Nov 90	12:51:00	9.6	7.2		98.8	10.4
FLAMEOUT						
1 Nov 90	14:41:00	70.2	7.9		95.9	9.9
1 Nov 90	14:42:00	28.3	4.8		112.4	12.5
1 Nov 90	14:43:00	23.1	5.3		108.4	12.1
1 Nov 90	14:44:00	19.7	5.8		105.7	11.6
1 Nov 90	14:45:00	17.2	6.0		105.6	11.5
1 Nov 90	14:46:00	16.9	5.8		107.4	11.6
1 Nov 90	14:47:00	103.1	8.2		76.7	9.4
1 Nov 90	14:48:00	511.6	3.0		96.0	14.1
1 Nov 90	14:49:00	849.7	2.0		88.7	14.4
1 Nov 90	14:50:00	667.7	10.9		56.6	7.2
1 Nov 90	14:51:00	545.4	11.2		57.8	7.1
1 Nov 90	14:52:00	828.9	3.3		100.1	14.0
1 Nov 90	14:53:00	-21.7	0.5		105.0	16.0
1 Nov 90	14:54:00	805.2	0.8		111.2	15.8
1 Nov 90	14:55:00	974.0	1.0		114.9	15.6
1 Nov 90	14:56:00	845.4	1.2		119.7	15.4

1 Nov 90	14:57:00	618.2	1.7	117.6	15.0
1 Nov 90	14:58:00	613.9	1.3	119.9	15.3
1 Nov 90	14:59:00	536.0	1.4	121.1	15.2
1 Nov 90	15:00:00	380.8	1.6	120.4	15.0
1 Nov 90	15:01:00	218.2	1.8	123.8	14.8
1 Nov 90	15:02:00	258.6	1.8	122.2	14.8
1 Nov 90	15:03:00	189.7	2.0	123.7	14.7
1 Nov 90	15:04:00	125.7	2.2	123.0	14.5
1 Nov 90	15:05:00	167.3	2.1	123.3	14.6
1 Nov 90	15:06:00	280.0	1.7	123.8	14.9
1 Nov 90	15:07:00	295.2	2.3	119.0	14.4
1 Nov 90	15:08:00	40.6	3.9	115.2	13.2
1 Nov 90	15:09:00	17.9	4.0	117.4	13.2
1 Nov 90	15:10:00	22.0	4.5	106.1	12.6
1 Nov 90	15:11:00	357.7	5.6	95.4	11.4
1 Nov 90	15:12:00	53.5	0.6	115.3	15.7
1 Nov 90	15:13:00	972.4	2.5	79.5	13.7
1 Nov 90	15:14:00	363.7	11.7	83.3	7.1
1 Nov 90	15:15:00	109.0	2.4	124.2	14.4
1 Nov 90	15:16:00	99.1	2.5	124.5	14.3
1 Nov 90	15:17:00	96.7	2.6	125.0	14.2
1 Nov 90	15:18:00	59.8	2.5	126.4	14.2
1 Nov 90	15:19:00	32.7	4.0	117.7	13.1
1 Nov 90	15:20:00	12.8	4.4	113.9	12.8
1 Nov 90	15:21:00	12.8	4.4	115.0	12.8
1 Nov 90	15:22:00	480.8	9.5	64.3	8.5
1 Nov 90	15:23:00	291.7	4.1	112.8	13.2
1 Nov 90	15:24:00	27.1	3.8	113.6	13.4
1 Nov 90	15:25:00	22.9	4.2	113.4	13.0
1 Nov 90	15:26:00	19.6	4.2	114.0	13.0
1 Nov 90	15:27:00	13.5	4.9	109.5	12.4
1 Nov 90	15:28:00	191.4	7.5	68.3	10.0
1 Nov 90	15:29:00	973.2	12.5	38.6	5.8
1 Nov 90	15:30:00	484.6	7.2	100.5	10.7
1 Nov 90	15:31:00	16.8	6.6	97.4	10.9
1 Nov 90	15:32:00	588.9	11.2	36.8	6.9
1 Nov 90	15:33:00	911.8	10.2	74.3	8.1
1 Nov 90	15:34:00	638.8	10.3	56.2	7.8
1 Nov 90	15:35:00	349.0	4.4	114.1	13.0
1 Nov 90	15:36:00	449.7	8.1	77.0	9.7
1 Nov 90	15:37:00	181.6	2.9	115.5	14.1
1 Nov 90	15:38:00	40.6	3.1	118.2	13.9
1 Nov 90	15:39:00	30.2	3.8	115.6	13.3
1 Nov 90	15:40:00	19.1	4.0	115.2	13.1
1 Nov 90	15:41:00	17.5	4.2	116.4	13.0
1 Nov 90	15:42:00	16.0	4.2	117.5	13.0
1 Nov 90	15:43:00	16.4	4.2	113.6	13.0
1 Nov 90	15:44:00	16.4	4.4	114.8	12.9
1 Nov 90	15:45:00	15.0	4.5	114.0	12.8
1 Nov 90	15:46:00	26.0	5.1	106.4	12.2
1 Nov 90	15:47:00	83.0	4.5	117.5	12.9
1 Nov 90	15:48:00	15.7	4.3	104.3	12.8
1 Nov 90	15:49:00	730.9	11.8	40.8	6.3
1 Nov 90	15:50:00	496.6	6.0	112.4	11.8
1 Nov 90	15:51:00	18.4	4.2	114.2	13.0
1 Nov 90	15:52:00	13.5	4.5	114.8	12.8
1 Nov 90	15:53:00	13.5	4.6	113.9	12.6
1 Nov 90	15:54:00	347.7	8.4	74.8	9.4
1 Nov 90	15:55:00	264.4	4.5	112.3	12.9
1 Nov 90	15:56:00	298.4	7.1	88.3	10.5
1 Nov 90	15:57:00	83.9	4.2	114.5	13.0
1 Nov 90	15:58:00	313.0	8.3	60.8	9.2
1 Nov 90	15:59:00	556.2	7.0	104.4	10.9
1 Nov 90	16:00:00	16.7	5.4	98.8	11.9
1 Nov 90	16:01:00	619.0	9.7	72.6	8.4
1 Nov 90	16:02:00	80.3	6.0	106.7	11.5
1 Nov 90	16:03:00	9.7	6.1	104.5	11.4
1 Nov 90	16:04:00	348.7	8.2	82.9	9.6
1 Nov 90	16:05:00	55.3	5.3	107.8	12.1
1 Nov 90	16:06:00	14.1	5.8	100.6	11.6
1 Nov 90	16:07:00	24.4	7.8	89.9	10.0
1 Nov 90	16:08:00	244.3	9.9	57.0	8.1
1 Nov 90	16:09:00	594.8	8.3	93.8	9.7
1 Nov 90	16:10:00	22.8	4.6	111.7	12.8
1 Nov 90	16:11:00	57.6	3.0	112.8	13.9
1 Nov 90	16:12:00	24.9	4.1	115.1	13.2
1 Nov 90	16:13:00	20.0	4.4	111.9	12.9
1 Nov 90	16:14:00	50.6	3.3	114.3	13.7
1 Nov 90	16:15:00	21.4	3.7	118.5	13.4

1 Nov 90	16:16:00	16.7	4.0	118.2	13.2
1 Nov 90	16:17:00	57.7	3.2	111.1	13.9
1 Nov 90	16:18:00	255.9	1.8	110.4	15.0
1 Nov 90	16:19:00	278.7	1.9	111.8	14.8
1 Nov 90	16:20:00	198.1	2.1	114.7	14.6
1 Nov 90	16:21:00	49.0	3.2	118.6	13.8
1 Nov 90	16:22:00	52.4	2.7	115.9	14.2
1 Nov 90	16:23:00	155.6	2.0	112.2	14.8
1 Nov 90	16:24:00	419.6	1.5	115.0	15.2
1 Nov 90	16:25:00	688.4	1.4	110.3	15.3
1 Nov 90	16:26:00	562.5	1.7	115.7	15.0
1 Nov 90	16:27:00	104.6	3.2	119.1	13.8
1 Nov 90	16:28:00	24.2	3.5	120.3	13.5
1 Nov 90	16:29:00	20.6	4.0	116.0	13.1
1 Nov 90	16:30:00	13.5	4.5	115.1	12.7
1 Nov 90	16:31:00	11.9	4.7	112.5	12.6
1 Nov 90	16:32:00	11.1	4.8	113.0	12.5
1 Nov 90	16:33:00	10.3	4.9	112.5	12.4
1 Nov 90	16:34:00	8.9	5.1	111.9	12.2
1 Nov 90	16:35:00	8.9	5.2	110.8	12.2
1 Nov 90	16:36:00	8.9	5.3	109.9	12.1
1 Nov 90	16:37:00	8.9	5.2	110.4	12.1
1 Nov 90	16:38:00	8.9	5.3	108.7	12.0
1 Nov 90	16:39:00	8.3	5.4	109.8	12.0
1 Nov 90	16:40:00	8.4	5.4	109.2	11.9
1 Nov 90	16:41:00	8.2	5.5	107.9	11.9
1 Nov 90	16:42:00	7.5	5.8	105.4	11.7
1 Nov 90	16:43:00	7.2	5.9	107.6	11.6
1 Nov 90	16:44:00	7.0	5.9	107.1	11.6
1 Nov 90	16:45:00	7.3	5.6	109.8	11.9
1 Nov 90	16:46:00	8.4	5.0	110.9	12.3
1 Nov 90	16:47:00	9.1	4.9	111.2	12.4
1 Nov 90	16:48:00	9.1	5.0	110.3	12.4
1 Nov 90	16:49:00	9.4	5.1	108.9	12.3
1 Nov 90	16:50:00	8.8	5.2	110.6	12.2
1 Nov 90	16:51:00	8.4	4.9	114.2	12.5
1 Nov 90	16:52:00	15.6	4.2	113.4	13.0
1 Nov 90	16:53:00	11.7	4.4	113.6	12.9
1 Nov 90	16:54:00	12.4	4.5	112.3	12.8
1 Nov 90	16:55:00	11.1	4.7	112.7	12.5
1 Nov 90	16:56:00	9.7	4.9	112.7	12.4
1 Nov 90	16:57:00	9.1	4.9	113.0	12.4
1 Nov 90	16:58:00	9.1	5.0	111.3	12.3
1 Nov 90	16:59:00	10.1	4.9	113.9	12.5
1 Nov 90	17:00:00	10.1	4.9	112.8	12.4
1 Nov 90	17:01:00	9.9	4.9	111.3	12.4
1 Nov 90	17:02:00	9.6	5.1	111.5	12.3
1 Nov 90	17:03:00	8.6	5.1	111.2	12.2
1 Nov 90	17:04:00	8.0	5.3	112.0	12.1
1 Nov 90	17:05:00	8.4	5.0	112.5	12.4
1 Nov 90	17:06:00	9.4	5.0	112.1	12.3
1 Nov 90	17:07:00	8.0	5.4	110.6	12.0
1 Nov 90	17:08:00	8.0	5.4	109.5	12.0
1 Nov 90	17:09:00	7.5	5.6	107.9	11.8
1 Nov 90	17:10:00	10.0	4.9	113.2	12.5
1 Nov 90	17:11:00	15.1	4.2	117.0	13.0
1 Nov 90	17:12:00	10.3	4.8	111.7	12.4
1 Nov 90	17:13:00	10.8	4.5	115.7	12.8
1 Nov 90	17:14:00	12.8	4.2	116.6	13.1
1 Nov 90	17:15:00	17.0	3.8	117.8	13.3
1 Nov 90	17:16:00	20.9	3.6	117.2	13.5
1 Nov 90	17:17:00	25.3	3.6	115.3	13.5
1 Nov 90	17:18:00	21.9	3.7	118.1	13.4
1 Nov 90	17:19:00	23.6	3.6	117.4	13.5
1 Nov 90	17:20:00	20.2	3.7	116.1	13.4
1 Nov 90	17:21:00	21.9	3.7	117.8	13.4
1 Nov 90	17:22:00	21.9	3.6	115.9	13.5
1 Nov 90	17:23:00	18.1	3.9	113.4	13.2
1 Nov 90	17:24:00	15.1	4.2	113.7	13.0
1 Nov 90	17:25:00	13.5	4.3	114.1	12.9
1 Nov 90	17:26:00	15.8	4.0	116.3	13.2
1 Nov 90	17:27:00	17.7	4.0	115.3	13.2
1 Nov 90	17:28:00	12.7	4.4	115.3	12.9
1 Nov 90	17:29:00	10.5	4.6	114.6	12.7
1 Nov 90	17:30:00	14.1	4.1	115.6	13.1
1 Nov 90	17:31:00	16.8	4.0	116.3	13.2
1 Nov 90	17:32:00	12.1	4.4	115.1	12.8
1 Nov 90	17:33:00	13.4	4.4	113.0	12.8
1 Nov 90	17:34:00	220.1	7.6	72.4	9.9

1 Nov 90	17:35:00	552.5	1.9	56.8	12.7
1 Nov 90	17:36:00	OFF	0.0	50.9	12.3
1 Nov 90	17:37:00	SCALE	0.0	83.3	14.1
1 Nov 90	17:38:00		0.3	108.8	15.4
1 Nov 90	17:39:00	819.0	1.3	125.3	15.1
1 Nov 90	17:40:00	476.1	1.9	127.6	14.6
1 Nov 90	17:41:00	297.1	6.2	93.0	11.2
1 Nov 90	17:42:00	344.4	2.2	121.7	14.5
1 Nov 90	17:43:00	278.0	1.6	117.5	15.0
1 Nov 90	17:44:00	491.2	1.5	119.8	15.1
1 Nov 90	17:45:00	387.5	1.7	118.5	15.0
1 Nov 90	17:46:00	336.5	1.6	119.8	15.1
1 Nov 90	17:47:00	387.2	1.6	117.9	15.1
1 Nov 90	17:48:00	460.0	1.7	118.7	15.0
1 Nov 90	17:49:00	84.1	2.9	120.7	14.0
1 Nov 90	17:50:00	31.8	3.1	118.0	13.9
1 Nov 90	17:51:00	33.0	3.1	118.1	13.9
1 Nov 90	17:52:00	25.7	3.4	119.2	13.6
1 Nov 90	17:53:00	20.4	3.6	118.7	13.5
1 Nov 90	17:54:00	19.8	3.6	118.9	13.5
1 Nov 90	17:55:00	17.0	3.8	120.1	13.3
1 Nov 90	17:56:00	15.5	4.1	116.7	13.1
1 Nov 90	17:57:00	13.0	4.2	117.6	13.0
1 Nov 90	17:58:00	12.6	4.3	116.0	12.9
1 Nov 90	17:59:00	11.6	4.5	114.6	12.8
1 Nov 90	18:00:00	11.0	4.6	114.0	12.7
1 Nov 90	18:01:00	9.6	4.8	114.2	12.5
1 Nov 90	18:02:00	9.7	4.9	113.0	12.4
1 Nov 90	18:03:00	9.2	5.3	109.8	12.1
1 Nov 90	18:04:00	8.3	5.4	109.9	12.0
1 Nov 90	18:05:00	8.4	5.4	107.4	12.0
1 Nov 90	18:06:00	297.6	7.4	87.0	10.3
1 Nov 90	18:07:00	104.3	5.0	110.9	12.3
1 Nov 90	18:08:00	16.0	4.4	112.9	12.9
1 Nov 90	18:09:00	16.2	4.3	113.9	13.0
1 Nov 90	18:10:00	18.1	3.9	114.6	13.3
1 Nov 90	18:11:00	16.9	4.1	115.8	13.1
1 Nov 90	18:12:00	16.8	4.1	114.6	13.0
1 Nov 90	18:13:00	12.9	4.5	113.4	12.7
1 Nov 90	18:14:00	10.3	4.8	113.6	12.5
1 Nov 90	18:15:00	10.3	4.6	112.8	12.7
1 Nov 90	18:16:00	14.1	4.2	113.1	13.0
1 Nov 90	18:17:00	14.5	4.1	112.2	13.1
1 Nov 90	18:18:00	13.7	4.4	113.3	12.8
1 Nov 90	18:19:00	10.2	4.9	110.7	12.4
1 Nov 90	18:20:00	8.2	5.4	108.9	11.9
1 Nov 90	18:21:00	7.5	6.0	104.0	11.4
1 Nov 90	18:22:00	7.0	6.1	105.2	11.3
1 Nov 90	18:23:00	7.0	6.0	104.8	11.4
1 Nov 90	18:24:00	7.2	6.2	102.3	11.3
1 Nov 90	18:25:00	7.0	6.1	103.8	11.4
1 Nov 90	18:26:00	7.8	6.2	103.8	11.3
1 Nov 90	18:27:00	7.5	6.1	104.1	11.4
1 Nov 90	18:28:00	8.0	6.0	103.1	11.4
1 Nov 90	18:29:00	7.4	6.0	105.4	11.5
1 Nov 90	18:30:00	7.0	6.0	103.3	11.5
1 Nov 90	18:31:00	7.0	6.3	103.0	11.2
1 Nov 90	18:32:00	7.1	6.2	102.9	11.3
1 Nov 90	18:33:00	8.0	6.0	103.2	11.4
1 Nov 90	18:34:00	7.4	6.0	104.2	11.5
1 Nov 90	18:35:00	7.3	6.0	104.5	11.5
1 Nov 90	18:36:00	7.4	5.6	108.3	11.8
1 Nov 90	18:37:00	12.1	5.5	95.8	11.8
1 Nov 90	18:38:00	365.7	7.5	95.7	10.3
1 Nov 90	18:39:00	17.2	6.5	99.8	11.0
1 Nov 90	18:40:00	10.1	6.9	96.7	10.7
1 Nov 90	18:41:00	9.9	7.0	96.2	10.6
1 Nov 90	18:42:00	11.0	7.5	90.5	10.2
1 Nov 90	18:43:00	227.3	9.0	75.1	9.0
1 Nov 90	18:44:00	206.2	8.3	78.7	9.6
1 Nov 90	18:45:00	193.0	8.6	83.6	9.4
1 Nov 90	18:46:00	37.2	8.3	87.8	9.7
1 Nov 90	18:47:00	84.2	7.5	90.9	10.3
1 Nov 90	18:48:00	23.3	5.8	103.3	11.9
1 Nov 90	18:49:00	41.9	4.3	105.7	12.9
1 Nov 90	18:50:00	65.7	5.4	105.6	12.1
1 Nov 90	18:51:00	83.7	5.5	103.2	12.0
1 Nov 90	18:52:00	32.8	5.4	102.9	11.9
1 Nov 90	18:53:00	19.3	5.7	103.0	11.8

1 Nov 90	18:54:00	13.4	5.3	107.6	12.2
1 Nov 90	18:55:00	13.0	5.5	103.9	11.9
1 Nov 90	18:56:00	18.5	4.8	109.1	12.5
1 Nov 90	18:57:00	19.0	5.1	105.8	12.2
1 Nov 90	18:58:00	11.3	5.7	104.9	11.7
1 Nov 90	18:59:00	9.7	5.5	105.4	11.9
1 Nov 90	19:00:00	9.9	5.9	104.6	11.6
1 Nov 90	19:01:00	9.4	5.9	103.6	11.5
1 Nov 90	19:02:00	8.9	6.4	101.8	11.2
1 Nov 90	19:03:00	9.1	5.6	107.1	11.9
1 Nov 90	19:04:00	8.5	5.5	104.2	11.9
1 Nov 90	19:05:00	8.6	5.9	103.4	11.6
1 Nov 90	19:06:00	10.3	5.0	110.1	12.4
1 Nov 90	19:07:00	8.9	5.1	107.7	12.3
1 Nov 90	19:08:00	10.3	4.9	108.9	12.4
1 Nov 90	19:09:00	10.9	5.2	106.0	12.2
1 Nov 90	19:10:00	10.6	4.9	108.8	12.5
1 Nov 90	19:11:00	11.5	5.0	108.6	12.4
1 Nov 90	19:12:00	9.8	5.0	108.0	12.3
1 Nov 90	19:13:00	8.4	5.4	107.4	12.0
1 Nov 90	19:14:00	8.9	5.6	104.2	11.9
1 Nov 90	19:15:00	11.4	6.0	101.1	11.4
1 Nov 90	19:16:00	8.8	6.4	99.9	11.1
1 Nov 90	19:17:00	7.0	6.0	103.7	11.5
1 Nov 90	19:18:00	8.0	6.2	101.8	11.3
1 Nov 90	19:19:00	8.4	5.7	103.6	11.7
1 Nov 90	19:20:00	8.7	6.3	98.1	11.1
1 Nov 90	19:21:00	8.7	6.7	96.8	10.9
1 Nov 90	19:22:00	8.5	6.7	97.8	10.9
1 Nov 90	19:23:00	10.2	7.0	96.0	10.7
1 Nov 90	19:24:00	11.1	7.2	92.6	10.5
1 Nov 90	19:25:00	11.6	7.3	93.9	10.4
1 Nov 90	19:26:00	12.1	7.4	92.4	10.3
1 Nov 90	19:27:00	10.8	7.3	94.2	10.5
1 Nov 90	19:28:00	10.8	7.2	96.2	10.5
1 Nov 90	19:29:00	8.0	6.9	97.9	10.7
1 Nov 90	19:30:00	8.2	6.9	97.1	10.7
1 Nov 90	19:31:00	8.2	6.4	100.0	11.1
1 Nov 90	19:32:00	7.4	6.1	102.7	11.4
1 Nov 90	19:33:00	7.6	6.5	98.3	11.1
1 Nov 90	19:34:00	7.7	6.6	98.7	11.0
1 Nov 90	19:35:00	8.2	6.6	101.3	11.1
1 Nov 90	19:36:00	7.2	5.8	103.1	11.7
1 Nov 90	19:37:00	7.0	6.1	100.7	11.4
1 Nov 90	19:38:00	7.0	6.1	102.1	11.4
1 Nov 90	19:39:00	6.8	6.0	99.8	11.5
1 Nov 90	19:40:00	7.0	6.3	100.8	11.2
1 Nov 90	19:41:00	7.0	6.5	99.4	11.1
1 Nov 90	19:42:00	7.0	6.5	99.9	11.0
1 Nov 90	19:43:00	6.5	6.5	99.0	11.1
1 Nov 90	19:44:00	7.0	6.5	99.7	11.1
1 Nov 90	19:45:00	7.0	6.7	98.7	10.9
1 Nov 90	19:46:00	8.1	7.0	96.6	10.7
1 Nov 90	19:47:00	7.7	6.9	96.4	10.8
1 Nov 90	19:48:00	8.0	6.9	96.7	10.8
1 Nov 90	19:49:00	8.6	6.9	96.3	10.7
1 Nov 90	19:50:00	8.9	6.9	95.4	10.7
1 Nov 90	19:51:00	8.9	7.2	93.8	10.5
1 Nov 90	19:52:00	10.6	7.4	93.0	10.4
1 Nov 90	19:53:00	9.5	7.1	95.8	10.6
1 Nov 90	19:54:00	11.8	7.4	91.5	10.4
1 Nov 90	19:55:00	11.9	7.5	92.1	10.3
1 Nov 90	19:56:00	11.5	7.5	91.1	10.3
1 Nov 90	19:57:00	10.6	7.4	93.0	10.4
1 Nov 90	19:58:00	9.6	7.0	95.8	10.7
1 Nov 90	19:59:00	8.1	6.8	96.4	10.8
1 Nov 90	20:00:00	8.1	6.9	96.7	10.8
1 Nov 90	20:01:00	8.2	6.9	95.8	10.7
1 Nov 90	20:02:00	8.3	6.8	96.2	10.8
1 Nov 90	20:03:00	8.4	7.0	94.5	10.6
1 Nov 90	20:04:00	8.5	6.8	97.7	10.9
1 Nov 90	20:05:00	6.9	6.2	100.1	11.4
1 Nov 90	20:06:00	6.3	5.9	101.6	11.6
1 Nov 90	20:07:00	7.0	6.1	98.8	11.4
1 Nov 90	20:08:00	6.5	6.2	100.2	11.4
1 Nov 90	20:09:00	6.3	6.2	101.1	11.3
1 Nov 90	20:10:00	6.8	6.5	101.3	11.1
1 Nov 90	20:11:00	7.0	6.6	98.7	11.0
1 Nov 90	20:12:00	7.0	6.7	97.0	10.9

1 Nov 90	20:13:00	8.0	6.8	96.2	10.8
1 Nov 90	20:14:00	8.0	6.8	96.3	10.8
1 Nov 90	20:15:00	8.4	7.0	95.1	10.6
1 Nov 90	20:16:00	9.7	7.0	95.6	10.7
1 Nov 90	20:17:00	8.4	6.9	95.4	10.7
1 Nov 90	20:18:00	9.4	7.1	95.1	10.6
1 Nov 90	20:19:00	9.2	7.1	94.7	10.6
1 Nov 90	20:20:00	9.3	7.1	95.8	10.6
1 Nov 90	20:21:00	8.5	6.9	96.7	10.7
1 Nov 90	20:22:00	8.0	6.9	95.9	10.7
1 Nov 90	20:23:00	8.6	7.0	94.4	10.6
1 Nov 90	20:24:00	10.2	7.2	92.9	10.5
1 Nov 90	20:25:00	9.6	7.1	94.6	10.6
1 Nov 90	20:26:00	8.2	6.7	98.4	10.9
1 Nov 90	20:27:00	7.0	6.5	99.3	11.0
1 Nov 90	20:28:00	7.0	6.6	97.1	11.0
1 Nov 90	20:29:00	7.3	6.4	98.9	11.2
1 Nov 90	20:30:00	6.7	6.2	101.7	11.4
1 Nov 90	20:31:00	6.4	5.9	103.6	11.6
1 Nov 90	20:32:00	6.8	5.7	102.0	11.8
1 Nov 90	20:33:00	7.0	5.9	102.1	11.6
1 Nov 90	20:34:00	7.0	6.4	97.7	11.1
1 Nov 90	20:35:00	7.0	6.7	97.1	10.9
1 Nov 90	20:36:00	7.0	6.6	98.0	11.0
1 Nov 90	20:37:00	7.0	6.6	98.2	11.0
1 Nov 90	20:38:00	7.5	6.7	95.8	10.9
1 Nov 90	20:39:00	7.9	6.8	96.2	10.8
1 Nov 90	20:40:00	8.5	6.6	97.8	11.0
1 Nov 90	20:41:00	8.0	6.6	98.2	11.0
1 Nov 90	20:42:00	7.8	6.5	97.1	11.1
1 Nov 90	20:43:00	7.0	6.4	99.8	11.2
1 Nov 90	20:44:00	8.5	6.7	94.5	10.9
1 Nov 90	20:45:00	14.9	7.0	97.0	10.7
1 Nov 90	20:46:00	8.0	6.8	95.7	10.8
1 Nov 90	20:47:00	8.3	6.9	96.0	10.8
1 Nov 90	20:48:00	8.3	6.8	97.6	10.9
1 Nov 90	20:49:00	8.2	6.7	97.3	10.9
1 Nov 90	20:50:00	8.3	6.9	94.4	10.8
1 Nov 90	20:51:00	9.0	7.0	95.7	10.7
1 Nov 90	20:52:00	9.0	6.8	97.2	10.8
1 Nov 90	20:53:00	8.3	6.7	96.6	10.9
1 Nov 90	20:54:00	7.4	6.3	98.6	11.3
1 Nov 90	20:55:00	7.4	6.2	100.2	11.4
1 Nov 90	20:56:00	6.7	6.3	98.9	11.3
1 Nov 90	20:57:00	7.0	6.4	97.7	11.2
1 Nov 90	20:58:00	7.0	6.3	98.8	11.3
1 Nov 90	20:59:00	7.3	6.1	101.0	11.5
1 Nov 90	21:00:00	8.1	5.8	102.3	11.7
1 Nov 90	21:01:00	8.5	6.0	101.3	11.5
1 Nov 90	21:02:00	7.3	6.5	97.8	11.1
1 Nov 90	21:03:00	8.7	6.8	95.3	10.8
1 Nov 90	21:04:00	8.8	6.7	98.9	11.0
1 Nov 90	21:05:00	6.9	6.6	95.4	11.0
1 Nov 90	21:06:00	12.8	6.7	97.5	11.0
1 Nov 90	21:07:00	23.3	7.1	92.9	10.6
1 Nov 90	21:08:00	28.6	6.5	97.7	11.1
1 Nov 90	21:09:00	13.7	7.1	93.0	10.6
1 Nov 90	21:10:00	13.5	6.9	94.5	10.7
1 Nov 90	21:11:00	10.2	7.2	91.6	10.5
1 Nov 90	21:12:00	21.8	7.4	93.2	10.4
1 Nov 90	21:13:00	12.5	7.7	88.2	10.2
1 Nov 90	21:14:00	14.2	7.6	90.6	10.3
1 Nov 90	21:15:00	12.1	7.4	93.0	10.4
1 Nov 90	21:16:00	10.1	7.3	92.5	10.5
1 Nov 90	21:17:00	11.0	7.3	93.2	10.5
1 Nov 90	21:18:00	10.7	7.3	93.2	10.5
1 Nov 90	21:19:00	10.5	7.1	94.4	10.6
1 Nov 90	21:20:00	8.3	6.8	95.2	10.9
1 Nov 90	21:21:00	7.9	6.7	96.2	10.9
1 Nov 90	21:22:00	7.0	6.7	96.6	10.9
1 Nov 90	21:23:00	7.4	6.5	96.2	11.1
1 Nov 90	21:24:00	8.0	6.5	97.8	11.1
1 Nov 90	21:25:00	7.0	6.7	96.1	10.9
1 Nov 90	21:26:00	7.0	6.5	97.6	11.1
1 Nov 90	21:27:00	7.0	6.3	98.0	11.3
1 Nov 90	21:28:00	9.4	7.0	93.5	10.7
1 Nov 90	21:29:00	8.6	6.8	96.8	10.9
1 Nov 90	21:30:00	7.5	6.8	95.1	10.9
1 Nov 90	21:31:00	12.1	6.6	96.9	11.1

1 Nov 90	21:32:00	35.8	6.6		95.8	11.1
1 Nov 90	21:33:00	56.8	6.7		95.4	10.9
1 Nov 90	21:34:00	15.4	6.9		92.2	10.8
1 Nov 90	21:35:00	16.0	7.3		93.4	10.5
1 Nov 90	21:36:00	10.6	7.3		91.2	10.5
1 Nov 90	21:37:00	11.0	7.4		93.1	10.5
1 Nov 90	21:38:00	10.6	7.3		91.5	10.5
1 Nov 90	21:39:00	15.8	7.6		89.1	10.2
1 Nov 90	21:40:00	22.6	7.6		89.5	10.2
1 Nov 90	21:41:00	20.9	7.9		85.0	10.0
1 Nov 90	21:42:00	81.5	7.6		87.6	10.2
1 Nov 90	21:43:00	123.0	7.9		88.4	10.1
1 Nov 90	21:44:00	26.8	8.1		85.0	9.8
1 Nov 90	21:45:00	23.4	8.0		87.3	9.9
1 Nov 90	21:46:00	18.1	8.0		86.3	9.9
1 Nov 90	21:47:00	17.1	7.9		87.3	10.0
1 Nov 90	21:48:00	13.1	7.3		92.5	10.5
1 Nov 90	21:49:00	191.2	7.4		89.3	10.5
1 Nov 90	21:50:00	71.3	4.7		104.2	12.6
1 Nov 90	21:51:00	9.7	5.3		102.4	12.2
1 Nov 90	21:52:00	8.1	5.9		100.6	11.6
1 Nov 90	21:53:00	8.6	6.3		97.2	11.2
1 Nov 90	21:54:00	11.6	7.2		93.9	10.5
1 Nov 90	21:55:00	8.1	6.8		96.0	10.9
1 Nov 90	21:56:00	7.9	6.7		88.6	10.9
	AVERAGE	71.1	5.3	0.2	105.2	12.0
SPAN GAS VALUE		255.0	6.0	25.0	250.0	5.0
AVERAGE BIAS ZERO		1.0	0.1	0.0	0.0	0.0
AVERAGE BIAS SPAN		257.0	5.9	23.8	241.2	5.1
BIAS CORRECTED AVG		69.8	5.4	0.2	109.0	11.9

ACETONE BURN CONTINUTED - NO BIAS CHECK PERFORMED ON THE CEM

		ID: CO UNIT: PPM	ID: O2 UNIT: PCT	ID: THC UNIT: PPM	ID: NOX UNIT: PPM	ID: CO2 UNIT: PCT
2 Nov 90	11:21:00	32.9	7.4	3.4	95.3	10.3
2 Nov 90	11:22:00	119.7	9.1	3.6	81.5	9.2
2 Nov 90	11:23:00	85.2	9.0	2.2	81.6	9.3
2 Nov 90	11:24:00	56.5	8.5	1.3	88.8	9.7
2 Nov 90	11:25:00	40.0	8.3	1.2	90.7	9.9
2 Nov 90	11:26:00	35.1	8.2	1.1	92.0	10.0
2 Nov 90	11:27:00	34.4	8.2	1.1	91.4	9.9
2 Nov 90	11:28:00	35.3	8.2	1.0	91.3	9.9
2 Nov 90	11:29:00	32.4	8.2	0.9	92.0	10.0
2 Nov 90	11:30:00	34.5	8.3	1.0	90.2	9.9
2 Nov 90	11:31:00	32.7	8.2	0.9	91.1	9.9
2 Nov 90	11:32:00	34.7	8.3	0.9	89.3	9.8
2 Nov 90	11:33:00	43.7	8.5	1.0	88.6	9.7
2 Nov 90	11:34:00	48.5	8.6	1.0	87.2	9.6
2 Nov 90	11:35:00	51.2	8.6	1.0	87.3	9.5
2 Nov 90	11:36:00	55.0	8.7	1.1	87.4	9.5
2 Nov 90	11:37:00	47.7	8.5	0.8	89.2	9.6
2 Nov 90	11:38:00	40.8	8.5	0.8	88.5	9.7
2 Nov 90	11:39:00	37.5	8.6	0.7	88.2	9.6
2 Nov 90	11:40:00	36.3	8.6	0.7	88.4	9.6
2 Nov 90	11:41:00	35.5	8.6	0.7	88.1	9.6
2 Nov 90	11:42:00	44.7	8.8	0.7	85.8	9.4
2 Nov 90	11:43:00	60.8	9.0	1.4	83.2	9.2
2 Nov 90	11:44:00	74.5	9.0	0.9	85.4	9.3
2 Nov 90	11:45:00	55.8	8.8	0.9	85.7	9.4
2 Nov 90	11:46:00	54.1	8.7	0.7	87.0	9.4
2 Nov 90	11:47:00	48.7	8.7	0.6	87.1	9.5
2 Nov 90	11:48:00	47.7	8.7	0.7	86.9	9.5
2 Nov 90	11:49:00	39.6	8.4	0.5	90.3	9.7
2 Nov 90	11:50:00	33.0	8.3	0.4	91.4	9.8
2 Nov 90	11:51:00	32.0	8.3	0.5	90.9	9.8
2 Nov 90	11:52:00	31.3	8.3	0.4	90.9	9.8
2 Nov 90	11:53:00	32.0	8.3	0.4	91.2	9.8
2 Nov 90	11:54:00	32.3	8.3	0.4	90.3	9.8
2 Nov 90	11:55:00	32.6	8.3	0.4	91.6	9.8
2 Nov 90	11:56:00	30.1	8.3	0.3	91.6	9.8
2 Nov 90	11:57:00	32.4	8.4	0.4	91.5	9.8
2 Nov 90	11:58:00	30.1	8.3	0.7	89.3	9.8
2 Nov 90	11:59:00	33.4	8.1	0.4	95.0	10.0
2 Nov 90	12:00:00	15.8	7.4	0.5	99.0	10.5
2 Nov 90	12:01:00	13.0	7.2	0.4	100.6	10.6
2 Nov 90	12:02:00	13.3	7.3	0.6	99.4	10.5

2 Nov 90	12:03:00	17.1	7.8	0.4	96.2	10.1
2 Nov 90	12:04:00	22.2	8.1	0.4	94.1	10.0
2 Nov 90	12:05:00	51.3	9.0	1.9	81.6	9.2
2 Nov 90	12:06:00	85.5	9.0	1.0	91.2	9.2
2 Nov 90	12:07:00	24.3	7.8	0.5	102.8	10.0
2 Nov 90	12:08:00	682.2	7.0	57.6	100.9	10.5
2 Nov 90	12:09:00	118.9	7.3	1.4	105.9	10.4
2 Nov 90	12:10:00	10.8	7.4	0.8	103.4	10.2
2 Nov 90	12:11:00	17.1	7.6	0.6	102.6	10.1
2 Nov 90	12:12:00	22.9	7.6	0.6	100.9	10.1
2 Nov 90	12:13:00	23.6	7.4	0.6	100.8	10.3
2 Nov 90	12:14:00	22.1	7.5	0.4	100.3	10.2
2 Nov 90	12:15:00	15.3	7.5	0.4	100.4	10.2
2 Nov 90	12:16:00	16.7	7.5	0.6	100.7	10.2
2 Nov 90	12:17:00	16.8	7.6	0.3	99.7	10.1
2 Nov 90	12:18:00	15.3	7.5	0.2	99.8	10.2
FLAMEOUT						
2 Nov 90	12:29:00	81.9	6.4	THC	100.6	11.0
2 Nov 90	12:30:00	29.7	6.8	CONTAMINATED	99.2	10.7
2 Nov 90	12:31:00	27.8	6.8	SAMPLE	99.5	10.7
2 Nov 90	12:32:00	24.2	6.7	LINE	98.7	10.8
2 Nov 90	12:33:00	34.5	7.2	DURING	96.2	10.4
2 Nov 90	12:34:00	22.0	6.6	FLAMEOUT	101.1	10.9
2 Nov 90	12:35:00	18.1	6.5		101.8	10.9
2 Nov 90	12:36:00	16.4	6.6		101.7	10.8
2 Nov 90	12:37:00	16.5	6.6		102.9	10.8
2 Nov 90	12:38:00	15.7	6.6		101.6	10.8
2 Nov 90	12:39:00	16.3	6.8		99.9	10.7
2 Nov 90	12:40:00	14.8	6.7		101.2	10.8
2 Nov 90	12:41:00	16.1	6.5		103.6	10.9
2 Nov 90	12:42:00	14.4	6.4		103.4	10.9
2 Nov 90	12:43:00	13.7	6.6		100.2	10.8
2 Nov 90	12:44:00	15.1	6.6		101.1	10.8
2 Nov 90	12:45:00	14.9	6.4		103.5	11.0
2 Nov 90	12:46:00	12.2	6.2		103.3	11.1
2 Nov 90	12:47:00	13.8	6.6		100.4	10.8
2 Nov 90	12:48:00	13.8	6.6		101.3	10.8
2 Nov 90	12:49:00	13.0	6.6		101.2	10.8
2 Nov 90	12:50:00	13.0	6.5		101.5	10.9
2 Nov 90	12:51:00	12.6	6.3		103.5	11.0
2 Nov 90	12:52:00	11.1	6.4		104.6	11.0
2 Nov 90	12:53:00	12.6	6.4		105.0	11.0
2 Nov 90	12:54:00	14.0	6.4		105.1	10.9
2 Nov 90	12:55:00	12.7	6.3		106.6	11.1
2 Nov 90	12:56:00	12.3	6.2		107.9	11.1
2 Nov 90	12:57:00	10.7	6.1		108.3	11.2
2 Nov 90	12:58:00	11.8	6.2		107.2	11.1
2 Nov 90	12:59:00	13.6	6.2		108.4	11.2
2 Nov 90	13:00:00	11.1	6.1		108.5	11.2
2 Nov 90	13:01:00	11.3	6.2		108.3	11.1
2 Nov 90	13:02:00	11.7	6.2		108.5	11.1
2 Nov 90	13:03:00	12.6	6.3		107.9	11.1
2 Nov 90	13:04:00	11.6	6.2		109.4	11.1
2 Nov 90	13:05:00	11.8	6.2		109.2	11.1
2 Nov 90	13:06:00	10.7	6.2		108.8	11.1
2 Nov 90	13:07:00	10.3	6.1		109.3	11.1
2 Nov 90	13:08:00	9.7	6.1		108.6	11.2
2 Nov 90	13:09:00	9.9	6.4		106.5	10.9
2 Nov 90	13:10:00	10.6	6.2		108.6	11.1
2 Nov 90	13:11:00	9.5	6.2		107.9	11.1
2 Nov 90	13:12:00	9.1	6.1		108.3	11.2
2 Nov 90	13:13:00	9.4	6.2		106.8	11.1
2 Nov 90	13:14:00	9.8	6.4		106.0	10.9
2 Nov 90	13:15:00	10.6	6.2		107.6	11.1
2 Nov 90	13:16:00	9.0	6.0		108.8	11.3
2 Nov 90	13:17:00	9.3	6.3		105.5	11.0
2 Nov 90	13:18:00	9.2	6.4		106.4	10.9
2 Nov 90	13:19:00	10.7	6.4		106.5	10.9
2 Nov 90	13:20:00	11.9	6.4		107.1	10.9
2 Nov 90	13:21:00	11.2	6.2		110.6	11.1
2 Nov 90	13:22:00	10.0	6.2		110.2	11.1
2 Nov 90	13:23:00	9.9	6.1		110.7	11.2
2 Nov 90	13:24:00	9.5	6.1		112.3	11.2
2 Nov 90	13:25:00	9.8	6.1		112.1	11.2
2 Nov 90	13:26:00	9.9	6.2		111.5	11.1
2 Nov 90	13:27:00	10.6	6.2		112.1	11.1
2 Nov 90	13:28:00	9.5	6.2		110.7	11.1
2 Nov 90	13:29:00	9.7	6.2		109.6	11.1
2 Nov 90	13:30:00	9.4	6.2		109.6	11.0

2 Nov 90	13:31:00	10.2	6.4	108.8	10.9
2 Nov 90	13:32:00	9.1	6.2	109.7	11.1
2 Nov 90	13:33:00	9.1	6.2	109.2	11.1
2 Nov 90	13:34:00	8.7	6.3	108.7	11.0
2 Nov 90	13:35:00	9.9	6.4	108.8	10.9
2 Nov 90	13:36:00	8.5	6.3	109.6	11.0
2 Nov 90	13:37:00	8.4	6.3	110.5	11.0
2 Nov 90	13:38:00	8.9	6.2	110.6	11.1
2 Nov 90	13:39:00	8.0	6.3	109.5	11.0
2 Nov 90	13:40:00	8.3	6.2	109.7	11.1
2 Nov 90	13:41:00	7.7	6.2	108.4	11.1
2 Nov 90	13:42:00	9.0	6.5	105.6	10.8
2 Nov 90	13:43:00	9.5	6.5	107.1	10.9
2 Nov 90	13:44:00	8.6	6.3	110.3	11.0
2 Nov 90	13:45:00	9.3	6.3	110.5	11.0
2 Nov 90	13:46:00	10.3	6.4	110.8	11.0
2 Nov 90	13:47:00	9.1	6.2	111.4	11.1
2 Nov 90	13:48:00	9.4	6.3	110.8	11.0
2 Nov 90	13:49:00	10.1	6.3	110.4	11.0
2 Nov 90	13:50:00	9.4	6.3	111.6	11.0
2 Nov 90	13:51:00	9.2	6.3	109.9	11.0
2 Nov 90	13:52:00	9.7	6.3	109.6	11.0
2 Nov 90	13:53:00	9.9	6.3	109.4	11.0
2 Nov 90	13:54:00	8.2	6.2	111.3	11.1
2 Nov 90	13:55:00	8.8	6.1	111.4	11.1
2 Nov 90	13:56:00	8.2	6.1	113.4	11.2
2 Nov 90	13:57:00	8.4	6.3	110.2	11.0
2 Nov 90	13:58:00	8.6	6.1	112.7	11.2
2 Nov 90	13:59:00	8.2	6.1	112.2	11.1
2 Nov 90	14:00:00	7.3	6.2	111.1	11.0
2 Nov 90	14:01:00	8.0	6.3	110.9	11.0
2 Nov 90	14:02:00	8.0	6.2	109.7	11.1
2 Nov 90	14:03:00	7.7	6.2	110.4	11.1
2 Nov 90	14:04:00	8.3	6.3	109.2	11.0
2 Nov 90	14:05:00	7.8	6.4	107.6	10.9
2 Nov 90	14:06:00	8.8	6.4	108.6	10.9
2 Nov 90	14:07:00	7.5	6.1	110.5	11.1
2 Nov 90	14:08:00	7.1	6.1	108.9	11.1
2 Nov 90	14:09:00	8.6	6.5	107.5	10.9
2 Nov 90	14:10:00	7.3	6.2	110.4	11.1
2 Nov 90	14:11:00	7.5	6.2	111.2	11.0
2 Nov 90	14:12:00	8.1	6.2	110.7	11.0
2 Nov 90	14:13:00	8.4	6.2	111.4	11.0
2 Nov 90	14:14:00	8.3	6.2	111.5	11.0
2 Nov 90	14:15:00	8.3	6.2	112.2	11.1
2 Nov 90	14:16:00	8.7	6.2	112.5	11.1
2 Nov 90	14:17:00	8.1	6.1	112.3	11.1
2 Nov 90	14:18:00	7.9	6.2	112.8	11.1
2 Nov 90	14:19:00	7.6	6.1	113.4	11.2
2 Nov 90	14:20:00	7.1	6.1	113.4	11.1
2 Nov 90	14:21:00	7.2	6.1	112.6	11.2
2 Nov 90	14:22:00	7.8	6.1	111.9	11.2
2 Nov 90	14:23:00	7.2	6.1	110.7	11.1
2 Nov 90	14:24:00	7.9	6.1	111.4	11.1
2 Nov 90	14:25:00	8.0	6.4	107.3	10.9
2 Nov 90	14:26:00	8.3	6.2	109.9	11.1
2 Nov 90	14:27:00	8.3	6.0	111.5	11.2
2 Nov 90	14:28:00	7.8	6.1	110.8	11.1
2 Nov 90	14:29:00	8.0	6.1	112.2	11.2
2 Nov 90	14:30:00	7.4	6.1	111.7	11.2
2 Nov 90	14:31:00	8.0	6.1	111.7	
2 Nov 90	14:32:00	7.4	6.3	108.3	
2 Nov 90	14:33:00	8.3	6.3	109.7	
2 Nov 90	14:34:00	7.1	6.1	109.8	
2 Nov 90	14:35:00	7.1	6.0	109.3	
2 Nov 90	14:36:00	7.3	6.3	107.0	
2 Nov 90	14:37:00	8.8	6.2	109.0	
2 Nov 90	14:38:00	6.8	6.0	111.0	
2 Nov 90	14:39:00	7.8	6.1	111.0	
2 Nov 90	14:40:00	7.5	6.0	111.0	
2 Nov 90	14:41:00	8.0	6.1	113.2	
2 Nov 90	14:42:00	8.0	6.2	112.0	
2 Nov 90	14:43:00	7.5	6.1	112.4	11.1
2 Nov 90	14:44:00	8.4	6.3	111.8	11.0
2 Nov 90	14:45:00	8.3	6.1	112.4	11.1
2 Nov 90	14:46:00	8.0	6.0	112.3	11.2
2 Nov 90	14:47:00	7.7	6.0	112.7	11.2
2 Nov 90	14:48:00	7.5	5.9	112.8	11.3
2 Nov 90	14:49:00	7.9	6.2	110.1	11.0

2 Nov 90	14:50:00	8.5	6.2	111.6	11.1
2 Nov 90	14:51:00	8.0	6.1	111.7	11.1
2 Nov 90	14:52:00	8.0	5.9	113.5	11.3
2 Nov 90	14:53:00	7.4	5.9	113.0	11.3
2 Nov 90	14:54:00	8.0	6.3	109.8	10.9
2 Nov 90	14:55:00	8.2	6.1	111.6	11.2
2 Nov 90	14:56:00	11.0	6.1	110.3	11.1
2 Nov 90	14:57:00	22.0	6.7	101.5	10.6
2 Nov 90	14:58:00	25.4	7.1	103.4	10.4
2 Nov 90	14:59:00	22.6	6.9	106.7	10.5
2 Nov 90	15:00:00	13.0	6.5	109.3	10.8
2 Nov 90	15:01:00	13.9	6.5	107.5	10.8
2 Nov 90	15:02:00	13.5	6.6	108.1	10.8
2 Nov 90	15:03:00	15.6	6.6	108.4	10.7
2 Nov 90	15:04:00	13.0	6.5	107.9	10.8
2 Nov 90	15:05:00	12.6	6.5	107.2	10.8
2 Nov 90	15:06:00	14.1	6.6	108.0	10.7
2 Nov 90	15:07:00	15.8	6.7	108.5	10.7
2 Nov 90	15:08:00	13.6	6.6	109.3	10.7
2 Nov 90	15:09:00	14.5	6.6	110.7	10.7
2 Nov 90	15:10:00	13.1	6.3	113.4	10.9
2 Nov 90	15:11:00	13.4	6.6	111.1	10.7
2 Nov 90	15:12:00	14.8	6.6	111.4	10.7
2 Nov 90	15:13:00	14.4	6.5	111.7	10.8
2 Nov 90	15:14:00	13.8	6.5	111.1	10.8
2 Nov 90	15:15:00	12.6	6.2	113.2	11.0
2 Nov 90	15:16:00	12.3	6.5	110.6	10.8
2 Nov 90	15:17:00	13.0	6.4	112.3	10.9
2 Nov 90	15:18:00	12.1	6.3	112.7	11.0
2 Nov 90	15:19:00	12.7	6.3	112.9	10.9
2 Nov 90	15:20:00	12.4	6.3	112.2	10.9
2 Nov 90	15:21:00	16.7	6.9	107.6	10.5
2 Nov 90	15:22:00	14.4	6.3	112.6	10.9
2 Nov 90	15:23:00	13.6	6.6	107.4	10.7
2 Nov 90	15:24:00	15.9	6.7	108.9	10.7
2 Nov 90	15:25:00	15.5	6.4	111.4	10.9
2 Nov 90	15:26:00	13.7	6.3	110.7	10.9
2 Nov 90	15:27:00	14.2	6.6	108.9	10.8
2 Nov 90	15:28:00	15.7	6.6	109.9	10.8
2 Nov 90	15:29:00	14.3	6.5	109.6	10.8
2 Nov 90	15:30:00	12.4	6.4	112.2	10.9
2 Nov 90	15:31:00	11.1	6.2	113.5	11.0
2 Nov 90	15:32:00	12.2	6.4	110.3	10.8
2 Nov 90	15:33:00	15.4	6.7	111.7	10.7
2 Nov 90	15:34:00	11.7	6.2	113.7	11.0
2 Nov 90	15:35:00	13.2	6.5	111.1	10.7
2 Nov 90	15:36:00	13.9	6.5	113.2	10.8
2 Nov 90	15:37:00	14.3	6.5	113.3	10.8
2 Nov 90	15:38:00	13.6	6.3	114.9	10.9
2 Nov 90	15:39:00	13.1	6.3	113.6	10.9
2 Nov 90	15:40:00	16.0	6.6	113.2	10.8
2 Nov 90	15:41:00	15.3	6.3	114.9	10.9
2 Nov 90	15:42:00	13.3	6.4	111.8	10.8
2 Nov 90	15:43:00	14.9	6.4	113.4	10.9
2 Nov 90	15:44:00	12.1	6.2	114.3	11.0
2 Nov 90	15:45:00	14.0	6.3	112.8	10.9
2 Nov 90	15:46:00	16.8	6.7	108.4	10.7
2 Nov 90	15:47:00	15.5	6.5	111.3	10.8
2 Nov 90	15:48:00	13.9	6.5	111.7	10.8
2 Nov 90	15:49:00	11.9	6.2	112.7	11.0
2 Nov 90	15:50:00	13.0	6.4	111.3	10.8
2 Nov 90	15:51:00	14.4	6.4	112.4	10.9
2 Nov 90	15:52:00	12.5	6.3	112.9	10.9
2 Nov 90	15:53:00	13.1	6.3	112.9	10.9
2 Nov 90	15:54:00	12.6	6.3	112.2	10.9
2 Nov 90	15:55:00	13.3	6.3	111.6	10.9
2 Nov 90	15:56:00	12.7	6.4	111.5	10.9
2 Nov 90	15:57:00	14.9	6.4	111.8	10.9
2 Nov 90	15:58:00	13.3	6.4	111.4	10.9
2 Nov 90	15:59:00	14.3	6.5	111.4	10.8
2 Nov 90	16:00:00	14.6	6.5	112.1	10.8
2 Nov 90	16:01:00	13.4	6.3	114.2	10.9
2 Nov 90	16:02:00	12.6	6.3	112.9	10.9
2 Nov 90	16:03:00	12.1	6.3	114.3	10.9
2 Nov 90	16:04:00	13.0	6.3	114.5	10.9
2 Nov 90	16:05:00	14.6	6.4	112.5	10.8
2 Nov 90	16:06:00	13.4	6.4	112.5	10.9
2 Nov 90	16:07:00	13.1	6.4	111.5	10.9
2 Nov 90	16:08:00	15.0	6.4	112.0	10.9

2 Nov 90	16:09:00	12.5	6.4		112.6	10.9
2 Nov 90	16:10:00	13.4	6.5		111.1	10.8
2 Nov 90	16:11:00	16.7	6.7		110.8	10.7
2 Nov 90	16:12:00	14.3	6.5		112.0	10.8
2 Nov 90	16:13:00	14.2	6.3		114.0	11.0
2 Nov 90	16:14:00	13.3	6.3		113.6	10.9
2 Nov 90	16:15:00	13.8	6.4		111.4	10.8
2 Nov 90	16:16:00	14.7	6.7		110.5	10.7
2 Nov 90	16:17:00	11.6	6.2		113.0	11.0
2 Nov 90	16:18:00	11.2	6.4		111.8	10.9
2 Nov 90	16:19:00	12.6	6.4		111.2	10.9
2 Nov 90	16:20:00	12.5	6.4		111.6	10.9
2 Nov 90	16:21:00	12.8	6.3		112.6	10.9
2 Nov 90	16:22:00	14.1	6.4		111.5	10.9
2 Nov 90	16:23:00	14.0	6.4		112.9	10.9
2 Nov 90	16:24:00	13.7	6.4		111.7	10.9
2 Nov 90	16:25:00	13.6	6.4		113.1	10.9
2 Nov 90	16:26:00	14.0	6.4		112.5	10.9
2 Nov 90	16:27:00	13.8	6.5		112.7	10.8
2 Nov 90	16:28:00	14.4	6.5		112.9	10.8
2 Nov 90	16:29:00	13.2	6.3		114.4	11.0
2 Nov 90	16:30:00	13.2	6.5		112.8	10.8
2 Nov 90	16:31:00	15.0	6.6		113.3	10.8
2 Nov 90	16:32:00	12.9	6.4		113.8	10.8
2 Nov 90	16:33:00	11.9	6.2		113.9	11.0
2 Nov 90	16:34:00	15.1	6.5		113.3	10.8
2 Nov 90	16:35:00	15.1	6.5		113.1	10.8
2 Nov 90	16:36:00	11.4	6.2		113.3	11.0
2 Nov 90	16:37:00	13.0	6.5		113.0	10.8
2 Nov 90	16:38:00	12.1	6.2		113.5	11.0
2 Nov 90	16:39:00	12.6	6.4		112.5	10.9
2 Nov 90	16:40:00	12.7	6.2		113.2	11.1
2 Nov 90	16:41:00	13.0	6.4		112.6	10.8
2 Nov 90	16:42:00	15.7	6.5		113.3	10.8
2 Nov 90	16:43:00	13.9	6.4		112.9	10.9
2 Nov 90	16:44:00	13.2	6.4		113.0	10.9
2 Nov 90	16:45:00	12.2	6.2		113.6	11.1
2 Nov 90	16:46:00	13.1	6.4		111.3	10.8
2 Nov 90	16:47:00	13.7	6.2		113.0	11.0
2 Nov 90	16:48:00	13.1	6.3		111.9	10.9
2 Nov 90	16:49:00	14.3	6.4		112.5	10.8
2 Nov 90	16:50:00	14.3	6.3		112.7	10.9
2 Nov 90	16:51:00	11.3	6.2		111.8	11.0
2 Nov 90	16:52:00	15.0	6.5		111.7	10.8
2 Nov 90	16:53:00	14.1	6.4		114.0	10.9
2 Nov 90	16:54:00	11.3	6.4		112.2	10.9
2 Nov 90	16:55:00	16.2	6.6		112.8	10.7
2 Nov 90	16:56:00	11.8	6.2		114.3	11.0
2 Nov 90	16:57:00	15.1	6.6		112.2	10.7
2 Nov 90	16:58:00	15.7	6.4		113.5	10.8
2 Nov 90	16:59:00	13.0	6.4		113.3	10.9
2 Nov 90	17:00:00	15.4	6.5		112.9	10.8
2 Nov 90	17:01:00	13.6	6.3		113.5	10.9
2 Nov 90	17:02:00	15.9	6.5		113.6	10.8
2 Nov 90	17:03:00	10.9	6.3		112.3	10.9
2 Nov 90	17:04:00	15.4	6.5		112.9	10.8
2 Nov 90	17:05:00	12.1	6.2		112.0	11.0
2 Nov 90	17:06:00	15.6	6.6		111.6	10.7
	AVERAGE	18.8	6.7	1.7	107.0	10.4

TEST NUMBER 5-3.6 POUNDS OF TNT
NOTE : SLURRY

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
31 Oct 90	23:35:00	18.8	6.5	0.4	149.9	10.9
31 Oct 90	23:36:00	17.5	6.5	0.4	149.0	10.8
31 Oct 90	23:37:00	14.3	6.0	0.5	156.0	11.3
31 Oct 90	23:38:00	14.8	6.2	0.5	156.0	11.1
31 Oct 90	23:39:00	13.7	6.4	0.5	155.5	10.9
31 Oct 90	23:40:00	14.8	6.6	0.5	153.2	10.8
31 Oct 90	23:41:00	17.2	6.4	0.5	155.8	10.9
31 Oct 90	23:42:00	14.8	6.7	0.5	154.6	10.8
31 Oct 90	23:43:00	18.1	6.9	0.5	155.0	10.6
31 Oct 90	23:44:00	18.5	6.7	0.4	154.9	10.7
31 Oct 90	23:45:00	17.4	7.0	0.4	153.1	10.5
31 Oct 90	23:46:00	17.5	6.9	0.4	147.9	10.5
31 Oct 90	23:47:00	16.2	6.5	0.4	147.0	10.7
31 Oct 90	23:48:00	19.5	5.8	0.4	152.7	11.4
31 Oct 90	23:49:00	13.3	6.4	0.4	155.3	10.9
31 Oct 90	23:50:00	18.2	6.4	0.4	155.4	10.9
31 Oct 90	23:51:00	19.1	6.7	0.4	155.0	10.8
31 Oct 90	23:52:00	19.6	6.7	0.4	153.4	10.7
31 Oct 90	23:53:00	18.1	6.4	0.4	155.1	10.9
31 Oct 90	23:54:00	22.5	6.9	1.0	151.1	10.6
31 Oct 90	23:55:00	22.1	7.3	0.7	148.9	10.3
31 Oct 90	23:56:00	30.1	7.6	0.8	148.6	10.0
31 Oct 90	23:57:00	33.0	6.7	0.7	150.4	10.6
31 Oct 90	23:58:00	31.2	7.1	0.6	147.4	10.5
31 Oct 90	23:59:00	67.0	8.1	1.1	128.3	9.5
FLAMEOUT						
1 Nov 90	00:05:00	21.6	7.0	0.9	151.0	10.4
1 Nov 90	00:06:00	17.8	7.3	0.7	149.5	10.3
1 Nov 90	00:07:00	19.2	7.6	0.9	147.6	10.1
1 Nov 90	00:08:00	22.1	8.0	0.8	143.6	9.8
1 Nov 90	00:09:00	31.6	8.2	0.7	141.6	9.6
1 Nov 90	00:10:00	27.4	8.3	0.4	141.8	9.5
1 Nov 90	00:11:00	31.6	8.1	0.6	142.9	9.7
1 Nov 90	00:12:00	24.2	8.1	0.4	143.6	9.7
1 Nov 90	00:13:00	26.7	8.4	0.6	142.7	9.5
1 Nov 90	00:14:00	38.2	8.3	0.4	140.8	9.5
1 Nov 90	00:15:00	32.1	8.2	0.4	140.7	9.6
1 Nov 90	00:16:00	27.1	8.3	0.4	141.0	9.5
1 Nov 90	00:17:00	36.0	8.2	0.5	141.2	9.6
1 Nov 90	00:18:00	41.8	8.4	0.4	140.3	9.4
1 Nov 90	00:19:00	38.3	8.5	0.3	139.9	9.4
1 Nov 90	00:20:00	40.9	8.8	0.5	138.0	9.1
1 Nov 90	00:21:00	61.1	9.0	0.6	134.8	9.0
1 Nov 90	00:22:00	63.4	9.3	1.1	131.4	8.7
1 Nov 90	00:23:00	84.7	9.3	0.9	130.9	8.7
1 Nov 90	00:24:00	139.2	10.0	4.7	119.9	8.2
1 Nov 90	00:25:00	207.9	9.8	3.9	122.8	8.2
1 Nov 90	00:26:00	143.8	9.6	1.7	128.8	8.4
1 Nov 90	00:27:00	124.0	9.7	19.1	125.0	8.4
FLAMEOUT						
1 Nov 90	00:37:00	16.9	5.2	2.5	154.1	11.9
1 Nov 90	00:38:00	15.9	5.5	2.2	155.6	11.7
1 Nov 90	00:39:00	14.9	5.8	1.8	155.0	11.4
1 Nov 90	00:40:00	13.5	5.9	1.6	153.5	11.3
1 Nov 90	00:41:00	13.1	6.0	1.4	155.2	11.2
1 Nov 90	00:42:00	12.4	6.2	1.2	156.8	11.1
1 Nov 90	00:43:00	11.6	6.2	1.1	152.5	11.0
1 Nov 90	00:44:00	12.2	6.2	1.2	152.8	11.0
1 Nov 90	00:45:00	12.8	6.2	1.1	152.6	11.1
1 Nov 90	00:46:00	12.8	6.2	0.9	150.9	11.1
1 Nov 90	00:47:00	12.4	6.2	0.9	152.1	11.0
1 Nov 90	00:48:00	11.8	6.4	0.8	153.0	10.9
1 Nov 90	00:49:00	11.8	6.3	0.8	151.6	10.9
1 Nov 90	00:50:00	13.7	6.4	0.7	151.1	10.9
1 Nov 90	00:51:00	11.9	6.5	0.7	151.2	10.8
1 Nov 90	00:52:00	13.2	6.7	0.6	150.1	10.7
1 Nov 90	00:53:00	10.1	6.7	0.6	150.3	10.7
1 Nov 90	00:54:00	13.5	6.8	1.2	148.8	10.6
1 Nov 90	00:55:00	15.6	6.8	0.8	149.0	10.6
1 Nov 90	00:56:00	15.2	6.7	0.7	149.4	10.7
1 Nov 90	00:57:00	14.8	6.9	0.6	148.5	10.6
1 Nov 90	00:58:00	17.6	7.3	0.6	145.5	10.3

1 Nov 90	00:59:00	14.9	6.2	0.6	148.2	10.9
1 Nov 90	01:00:00	13.1	4.3	0.7	148.2	12.5
1 Nov 90	01:01:00	21.2	3.9	0.7	144.2	12.9
1 Nov 90	01:02:00	32.6	3.4	0.7	144.4	13.3
1 Nov 90	01:03:00	26.4	4.3	0.6	149.5	12.7
1 Nov 90	01:04:00	13.7	4.7	0.6	150.7	12.3
1 Nov 90	01:05:00	12.6	5.8	0.6	151.7	11.7
1 Nov 90	01:06:00	25.9	7.7	0.7	148.3	10.0
1 Nov 90	01:07:00	31.1	7.7	0.6	146.3	9.9
1 Nov 90	01:08:00	24.7	7.7	0.6	144.2	9.9
1 Nov 90	01:09:00	30.6	8.2	1.1	140.8	9.6
1 Nov 90	01:10:00	62.6	8.7	0.8	136.1	9.2
1 Nov 90	01:11:00	46.1	8.6	0.7	139.2	9.3
1 Nov 90	01:14:00	23.3	7.8	0.3	142.0	9.9
1 Nov 90	01:15:00	25.8	7.8	0.4	142.4	9.9
1 Nov 90	01:16:00	26.4	7.8	0.3	143.9	9.9
1 Nov 90	01:17:00	18.5	7.7	0.2	143.5	9.9
1 Nov 90	01:18:00	30.5	8.0	0.4	140.1	9.7
1 Nov 90	01:19:00	28.1	7.7	0.3	143.3	9.9
1 Nov 90	01:20:00	22.8	7.6	0.4	142.1	10.1
1 Nov 90	01:21:00	24.7	7.6	0.5	143.2	10.0
FLAMEOUT						
1 Nov 90	01:31:00	18.5	7.4	0.1	145.8	10.1
1 Nov 90	01:32:00	17.4	7.3	0.0	143.8	10.3
1 Nov 90	01:33:00	15.9	7.6	0.0	145.4	10.0
1 Nov 90	01:34:00	16.8	7.8	0.0	143.4	9.9
1 Nov 90	01:35:00	17.9	7.7	0.0	143.4	9.9
1 Nov 90	01:36:00	16.4	7.4	0.1	144.3	10.2
1 Nov 90	01:37:00	16.6	7.6	0.0	145.0	10.0
1 Nov 90	01:38:00	17.4	8.0	0.1	140.8	9.8
1 Nov 90	01:39:00	68.9	7.1	26.4	137.0	10.0
1 Nov 90	01:40:00	619.3	5.9	40.3	99.7	11.5
1 Nov 90	01:41:00	583.5	4.9	101.4	103.5	10.6
1 Nov 90	01:42:00	180.7	6.0	13.4	153.9	11.5
1 Nov 90	01:43:00	46.1	7.0	1.1	153.6	10.4
1 Nov 90	01:44:00	19.1	6.8	0.5	152.9	10.6
1 Nov 90	01:45:00	19.1	6.8	0.4	153.3	10.6
1 Nov 90	01:46:00	15.5	6.8	0.4	152.0	10.6
1 Nov 90	01:47:00	25.1	6.6	0.3	151.9	10.7
1 Nov 90	01:48:00	19.8	6.6	0.3	152.7	10.8
1 Nov 90	01:49:00	20.0	6.6	0.2	152.7	10.8
1 Nov 90	01:50:00	18.3	6.5	0.2	153.6	10.9
1 Nov 90	01:51:00	17.8	6.6	0.3	152.6	10.8
1 Nov 90	01:52:00	14.6	6.8	0.2	153.9	10.7
1 Nov 90	01:53:00	15.7	6.8	0.1	154.4	10.6
1 Nov 90	01:54:00	16.6	6.7	0.1	153.6	10.7
1 Nov 90	01:55:00	17.0	6.8	0.1	151.0	10.6
1 Nov 90	01:56:00	15.9	6.9	0.1	150.8	10.6
1 Nov 90	01:57:00	13.8	6.8	0.1	152.3	10.6
1 Nov 90	01:58:00	19.5	6.9	0.1	150.7	10.5
1 Nov 90	01:59:00	20.6	7.0	0.1	149.5	10.5
1 Nov 90	02:00:00	16.4	7.3	0.2	149.4	10.3
1 Nov 90	02:01:00	30.9	7.6	0.2	146.5	10.1
1 Nov 90	02:02:00	29.0	7.6	0.1	145.7	10.0
1 Nov 90	02:03:00	24.1	7.5	0.1	146.8	10.1
1 Nov 90	02:04:00	21.4	7.4	0.0	148.8	10.2
1 Nov 90	02:05:00	21.8	7.4	0.2	148.9	10.2
1 Nov 90	02:06:00	35.7	7.8	0.4	145.5	9.9
1 Nov 90	02:07:00	41.1	7.8	0.3	145.0	9.9
1 Nov 90	02:08:00	33.8	7.7	0.2	146.3	9.9
1 Nov 90	02:09:00	35.3	7.9	0.2	145.3	9.8
1 Nov 90	02:10:00	33.4	7.6	0.1	146.5	10.0
1 Nov 90	02:11:00	20.6	7.6	0.0	147.0	10.1
1 Nov 90	02:12:00	24.8	7.4	0.1	147.4	10.1
1 Nov 90	02:13:00	28.4	7.4	0.1	145.5	10.2
1 Nov 90	02:14:00	33.2	7.5	0.1	145.5	10.1
1 Nov 90	02:15:00	33.8	7.5	0.2	146.2	10.1
1 Nov 90	02:16:00	32.7	7.8	0.1	145.0	9.9
1 Nov 90	02:17:00	36.9	7.9	0.1	144.5	9.8
1 Nov 90	02:18:00	36.3	8.0	0.2	143.2	9.8
1 Nov 90	02:19:00	41.2	8.2	0.4	141.0	9.7
1 Nov 90	02:20:00	54.7	8.6	0.5	135.6	9.3
1 Nov 90	02:21:00	57.0	8.4	0.3	138.9	9.4
1 Nov 90	02:22:00	50.1	8.6	0.6	135.8	9.3
1 Nov 90	02:23:00	171.0	9.0	58.5	110.9	8.7
1 Nov 90	02:24:00	658.3	7.3	18.2	98.4	10.2
1 Nov 90	02:25:00	271.8	6.2	71.6	99.8	10.1
1 Nov 90	02:26:00	427.9	4.7	38.7	146.4	12.2
1 Nov 90	02:27:00	85.0	7.0	3.6	149.7	10.4

1 Nov 90	02:28:00	23.8	6.9	2.0	150.3	10.5
1 Nov 90	02:29:00	20.2	6.7	1.4	149.4	10.7
1 Nov 90	02:30:00	18.1	6.6	1.1	151.4	10.8
1 Nov 90	02:31:00	19.1	6.5	0.8	152.2	10.8
1 Nov 90	02:32:00	14.5	6.5	0.7	152.9	10.8
1 Nov 90	02:33:00	18.0	6.5	0.6	151.1	10.8
1 Nov 90	02:34:00	17.1	6.5	0.5	151.3	10.8
1 Nov 90	02:35:00	15.7	6.5	0.4	150.6	10.8
1 Nov 90	02:36:00	14.7	6.6	0.4	150.2	10.8
1 Nov 90	02:37:00	16.5	6.7	0.3	150.9	10.7
1 Nov 90	02:38:00	18.4	6.7	0.3	149.7	10.7
1 Nov 90	02:39:00	22.6	6.9	0.3	148.5	10.6
1 Nov 90	02:40:00	16.0	6.9	0.4	148.1	10.5
1 Nov 90	02:41:00	17.5	6.9	0.3	149.7	10.6
1 Nov 90	02:42:00	14.6	6.9	0.1	149.6	10.6
1 Nov 90	02:43:00	18.6	7.1	0.2	147.7	10.4
1 Nov 90	02:44:00	17.7	6.9	0.1	149.0	10.6
1 Nov 90	02:45:00	17.5	6.8	0.2	148.8	10.6
1 Nov 90	02:46:00	20.7	7.0	0.1	147.4	10.5
1 Nov 90	02:47:00	23.0	6.8	0.2	147.1	10.6
1 Nov 90	02:48:00	24.7	6.6	0.2	148.1	10.8
1 Nov 90	02:49:00	19.7	6.9	0.2	146.9	10.6
1 Nov 90	02:50:00	23.4	7.3	0.2	146.8	10.3
1 Nov 90	02:51:00	26.4	7.4	0.2	146.1	10.2
1 Nov 90	02:52:00	25.6	7.4	0.1	144.4	10.1
1 Nov 90	02:53:00	21.8	7.0	0.1	147.2	10.5
1 Nov 90	02:54:00	22.6	7.1	0.3	145.9	10.4
1 Nov 90	02:55:00	31.0	6.9	0.3	145.9	10.5
1 Nov 90	02:56:00	30.8	7.1	0.0	147.0	10.5
1 Nov 90	02:57:00	32.8	7.2	0.4	146.1	10.3
1 Nov 90	02:58:00	34.3	7.0	0.1	146.2	10.5
1 Nov 90	02:59:00	26.6	7.0	0.2	146.0	10.5
1 Nov 90	03:00:00	35.3	7.2	0.2	144.7	10.4
1 Nov 90	03:01:00	30.7	7.1	0.2	145.9	10.4
1 Nov 90	03:02:00	36.0	7.0	0.2	145.4	10.4
1 Nov 90	03:03:00	33.8	7.2	0.3	144.4	10.4
1 Nov 90	03:04:00	49.0	7.5	0.5	142.1	10.1
1 Nov 90	03:05:00	48.3	7.1	0.2	143.6	10.4
1 Nov 90	03:06:00	26.2	7.3	0.2	144.1	10.3
1 Nov 90	03:07:00	42.3	7.3	0.2	143.6	10.2
PUMP PROBLEMS						
1 Nov 90	05:33:00	7.6	7.0	0.4	103.4	10.3
1 Nov 90	05:34:00	7.0	6.9	0.5	103.5	10.3
1 Nov 90	05:35:00	7.9	7.0	0.4	102.8	10.3
1 Nov 90	05:36:00	7.5	7.0	0.5	102.3	10.3
1 Nov 90	05:37:00	8.0	7.0	0.4	103.4	10.3
1 Nov 90	05:38:00	7.6	6.9	0.5	105.3	10.4
1 Nov 90	05:39:00	7.0	6.9	0.5	105.0	10.4
1 Nov 90	05:40:00	8.0	7.0	0.4	104.4	10.3
1 Nov 90	05:41:00	8.0	7.0	0.4	104.7	10.3
1 Nov 90	05:42:00	8.0	7.0	0.4	103.4	10.3
1 Nov 90	05:43:00	8.3	7.0	0.4	102.9	10.2
1 Nov 90	05:44:00	7.1	7.0	0.4	105.1	10.3
1 Nov 90	05:45:00	7.0	6.8	0.4	106.0	10.4
1 Nov 90	05:46:00	7.3	7.0	0.4	104.8	10.3
1 Nov 90	05:47:00	7.0	6.9	0.3	104.7	10.3
1 Nov 90	05:48:00	7.8	6.9	0.4	104.8	10.3
1 Nov 90	05:49:00	7.2	6.9	0.3	104.8	10.3
1 Nov 90	05:50:00	8.0	7.0	0.3	103.4	10.3
1 Nov 90	05:51:00	7.8	7.1	0.3	102.2	10.2
1 Nov 90	05:52:00	7.9	7.0	0.3	102.4	10.2
1 Nov 90	05:53:00	8.0	7.1	0.3	102.8	10.2
1 Nov 90	05:54:00	8.0	7.1	0.2	102.2	10.2
1 Nov 90	05:55:00	8.0	7.1	0.3	102.7	10.2
1 Nov 90	05:56:00	7.6	7.0	0.3	103.2	10.3
1 Nov 90	05:57:00	7.7	7.1	0.3	103.3	10.3
1 Nov 90	05:58:00	7.6	7.0	0.3	103.0	10.3
1 Nov 90	05:59:00	7.5	7.0	0.2	102.5	10.3
1 Nov 90	06:00:00	7.1	7.0	0.3	102.9	10.3
1 Nov 90	06:01:00	7.7	7.1	0.2	101.8	10.2
1 Nov 90	06:02:00	8.0	7.1	0.2	102.4	10.2
1 Nov 90	06:03:00	7.4	7.0	0.3	102.4	10.3
1 Nov 90	06:04:00	7.8	7.1	0.2	100.9	10.2
1 Nov 90	06:05:00	8.0	7.0	0.3	101.8	10.2
1 Nov 90	06:06:00	7.0	7.0	0.2	101.8	10.3
1 Nov 90	06:07:00	7.9	7.0	0.3	102.3	10.3
1 Nov 90	06:08:00	8.0	7.0	0.3	102.5	10.3
1 Nov 90	06:09:00	7.8	7.1	0.2	102.2	10.2
1 Nov 90	06:10:00	7.5	7.1	0.2	102.2	10.2

1 Nov 90	06:11:00	7.0	7.1	0.2	103.6	10.2
1 Nov 90	06:12:00	7.0	7.0	0.2	103.7	10.3
1 Nov 90	06:13:00	7.0	7.0	0.2	103.2	10.3
1 Nov 90	06:14:00	7.0	7.1	0.2	102.3	10.2
1 Nov 90	06:15:00	7.0	7.0	0.2	104.1	10.3
1 Nov 90	06:16:00	7.0	7.0	0.2	104.6	10.3
1 Nov 90	06:17:00	7.0	6.9	0.2	104.6	10.3
1 Nov 90	06:18:00	7.0	7.0	0.2	104.5	10.3
1 Nov 90	06:19:00	7.0	7.2	0.2	101.6	10.2
1 Nov 90	06:20:00	7.8	7.1	0.2	102.7	10.2
1 Nov 90	06:21:00	7.0	7.0	0.2	103.1	10.3
1 Nov 90	06:22:00	7.0	7.1	0.3	102.4	10.2
1 Nov 90	06:23:00	7.0	7.2	0.3	101.6	10.1
1 Nov 90	06:24:00	7.0	7.1	0.2	102.3	10.2
1 Nov 90	06:25:00	7.0	7.1	0.2	102.3	10.2
1 Nov 90	06:26:00	7.3	7.1	0.2	102.8	10.2
1 Nov 90	06:27:00	7.0	7.1	0.2	103.8	10.2
1 Nov 90	06:28:00	7.0	7.1	0.1	103.2	10.2
1 Nov 90	06:29:00	7.0	7.1	0.1	102.5	10.2
1 Nov 90	06:30:00	7.0	7.1	0.1	102.4	10.2
1 Nov 90	06:31:00	7.0	7.1	0.1	102.3	10.2
1 Nov 90	06:32:00	7.0	7.1	0.1	102.5	10.2
1 Nov 90	06:33:00	7.0	7.1	0.1	103.0	10.2
1 Nov 90	06:34:00	7.0	7.0	0.1	103.8	10.3
1 Nov 90	06:35:00	7.0	7.1	0.0	103.7	10.2
1 Nov 90	06:36:00	7.0	7.1	0.0	103.0	10.2
1 Nov 90	06:37:00	7.0	7.0	0.0	103.6	10.3
1 Nov 90	06:38:00	7.0	7.1	0.1	102.7	10.2
1 Nov 90	06:39:00	7.0	7.1	0.0	102.9	10.2
1 Nov 90	06:40:00	7.2	7.1	0.0	102.3	10.2
1 Nov 90	06:41:00	7.0	7.1	0.0	103.0	10.2
1 Nov 90	06:42:00	7.0	7.2	0.0	102.4	10.2
1 Nov 90	06:43:00	7.0	7.2	0.1	102.1	10.2
1 Nov 90	06:44:00	7.8	7.1	0.2	103.0	10.2
1 Nov 90	06:45:00	6.8	7.0	0.2	104.2	10.3
1 Nov 90	06:46:00	7.0	7.1	0.1	102.8	10.2
1 Nov 90	06:47:00	7.2	7.1	0.1	101.9	10.2
1 Nov 90	06:48:00	7.1	7.1	0.1	102.6	10.2
1 Nov 90	06:49:00	6.5	7.0	0.1	103.5	10.3
1 Nov 90	06:50:00	7.0	7.0	0.0	104.4	10.3
1 Nov 90	06:51:00	7.0	7.1	0.0	103.7	10.3
1 Nov 90	06:52:00	7.0	7.2	0.0	101.6	10.2
1 Nov 90	06:53:00	7.0	7.1	0.0	103.9	10.2
1 Nov 90	06:54:00	7.0	7.1	0.0	102.7	10.2
1 Nov 90	06:55:00	7.0	7.1	0.0	102.5	10.2
1 Nov 90	06:56:00	7.0	7.0	0.0	102.9	10.2
1 Nov 90	06:57:00	7.0	7.1	-0.0	102.5	10.2
1 Nov 90	06:58:00	7.3	7.1	-0.1	103.2	10.2
1 Nov 90	06:59:00	7.0	7.0	-0.0	103.5	10.2
1 Nov 90	07:00:00	6.3	7.0	-0.0	104.5	10.3
1 Nov 90	07:01:00	6.5	7.1	-0.1	103.9	10.3
1 Nov 90	07:02:00	7.0	7.2	-0.1	102.0	10.2
1 Nov 90	07:03:00	6.8	7.1	-0.1	104.0	10.2
1 Nov 90	07:04:00	6.5	7.0	0.1	104.5	10.3
1 Nov 90	07:05:00	7.0	7.0	0.2	103.0	10.3
1 Nov 90	07:06:00	7.0	7.0	5.6	103.4	10.3
1 Nov 90	07:07:00	7.0	7.1	6.5	103.6	10.3
1 Nov 90	07:08:00	7.0	7.0	3.2	103.5	10.3
1 Nov 90	07:09:00	7.0	7.0	2.6	104.2	10.3
1 Nov 90	07:10:00	6.8	6.9	1.6	104.5	10.3
1 Nov 90	07:11:00	9.4	7.5	1.2	103.2	10.0
	AVERAGE	32.1	7.1	1.9	133.2	10.3
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	0.0	0.0	0.0
	AVERAGE BIAS SPAN	256.9	5.9	23.8	249.0	5.0
	BIAS CORRECTED AVG	30.9	7.2	2.0	133.7	10.3

TITLE: TEST NUMBER 5
NOTE : START STACK TEST AT 2335

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
31 Oct 90	23:35:00	18.8	6.5	0.4	149.9	10.9
31 Oct 90	23:36:00	17.5	6.5	0.4	149.0	10.8
31 Oct 90	23:37:00	14.3	6.0	0.5	156.0	11.3
31 Oct 90	23:38:00	14.8	6.2	0.5	156.4	11.1
31 Oct 90	23:39:00	13.7	6.4	0.5	155.5	10.9
31 Oct 90	23:40:00	14.8	6.6	0.5	153.2	10.8
31 Oct 90	23:41:00	17.2	6.4	0.5	155.8	10.9
31 Oct 90	23:42:00	14.8	6.7	0.5	154.6	10.8
31 Oct 90	23:43:00	18.1	6.9	0.5	155.0	10.6
31 Oct 90	23:44:00	18.5	6.7	0.4	154.9	10.7
31 Oct 90	23:45:00	17.4	7.0	0.4	153.1	10.5
31 Oct 90	23:46:00	17.5	6.9	0.4	147.9	10.5
31 Oct 90	23:47:00	16.2	6.5	0.4	147.0	10.7
31 Oct 90	23:48:00	19.5	5.8	0.4	152.7	11.4
31 Oct 90	23:49:00	13.3	6.4	0.4	155.3	10.9
31 Oct 90	23:50:00	18.2	6.4	0.4	155.4	10.9
31 Oct 90	23:51:00	19.1	6.7	0.4	155.0	10.8
31 Oct 90	23:52:00	19.6	6.7	0.4	153.4	10.7
31 Oct 90	23:53:00	18.1	6.4	0.4	155.1	10.9
31 Oct 90	23:54:00	22.5	6.9	1.0	151.1	10.6
31 Oct 90	23:55:00	22.1	7.3	0.7	148.9	10.3
31 Oct 90	23:56:00	30.1	7.6	0.8	148.6	10.0
31 Oct 90	23:57:00	33.0	6.7	0.7	150.4	10.6
31 Oct 90	23:58:00	31.2	7.1	0.6	147.4	10.5
31 Oct 90	23:59:00	67.0	8.1	1.1	128.3	9.5
1 Nov 90	00:05:00	21.6	7.0	0.9	151.0	10.4
1 Nov 90	00:06:00	17.8	7.3	0.7	149.5	10.3
1 Nov 90	00:07:00	19.2	7.6	0.9	147.6	10.1
1 Nov 90	00:08:00	22.1	8.0	0.8	143.6	9.8
1 Nov 90	00:09:00	31.6	8.2	0.7	141.6	9.6
1 Nov 90	00:10:00	27.4	8.3	0.4	141.8	9.5
1 Nov 90	00:11:00	31.6	8.1	0.6	142.9	9.7
1 Nov 90	00:12:00	24.2	8.1	0.4	143.6	9.7
1 Nov 90	00:13:00	26.7	8.4	0.6	142.7	9.5
1 Nov 90	00:14:00	38.2	8.3	0.4	140.8	9.5
1 Nov 90	00:15:00	32.1	8.2	0.4	140.7	9.6
1 Nov 90	00:16:00	27.1	8.3	0.4	141.0	9.5
1 Nov 90	00:17:00	36.0	8.2	0.5	141.2	9.6
1 Nov 90	00:18:00	41.8	8.4	0.4	140.3	9.4
1 Nov 90	00:19:00	38.3	8.5	0.3	139.9	9.4
1 Nov 90	00:20:00	40.9	8.8	0.5	138.0	9.1
1 Nov 90	00:21:00	61.1	9.0	0.6	134.8	9.0
1 Nov 90	00:22:00	63.4	9.3	1.1	131.4	8.7
1 Nov 90	00:23:00	84.7	9.3	0.9	130.9	8.7
1 Nov 90	00:24:00	139.2	10.0	4.7	119.9	8.2
1 Nov 90	00:25:00	207.9	9.8	3.9	122.8	8.2
1 Nov 90	00:26:00	143.8	9.6	1.7	128.8	8.4
1 Nov 90	00:27:00	124.0	9.7	19.1	125.0	8.4
1 Nov 90	00:37:00	16.9	5.2	2.5	154.1	11.9
1 Nov 90	00:38:00	15.9	5.5	2.2	155.6	11.7
1 Nov 90	00:39:00	14.9	5.8	1.8	155.0	11.4
1 Nov 90	00:40:00	13.5	5.9	1.6	153.5	11.3
1 Nov 90	00:41:00	13.1	6.0	1.4	155.2	11.2
1 Nov 90	00:42:00	12.4	6.2	1.2	156.8	11.1
1 Nov 90	00:43:00	11.6	6.2	1.1	152.5	11.0
1 Nov 90	00:44:00	12.2	6.2	1.2	152.8	11.0
1 Nov 90	00:45:00	12.8	6.2	1.1	152.6	11.1
1 Nov 90	00:46:00	12.8	6.2	0.9	150.9	11.1
1 Nov 90	00:47:00	12.4	6.2	0.9	152.1	11.0
1 Nov 90	00:48:00	11.8	6.4	0.8	153.0	10.9
1 Nov 90	00:49:00	11.8	6.3	0.8	151.6	10.9
1 Nov 90	00:50:00	13.7	6.4	0.7	151.1	10.9
1 Nov 90	00:51:00	11.9	6.5	0.7	151.2	10.8
1 Nov 90	00:52:00	13.2	6.7	0.6	150.1	10.7
1 Nov 90	00:53:00	10.1	6.7	0.6	150.3	10.7
1 Nov 90	00:54:00	13.5	6.8	1.2	148.8	10.6
1 Nov 90	00:55:00	15.6	6.8	0.8	149.0	10.6
1 Nov 90	00:56:00	15.2	6.7	0.7	149.4	10.7
1 Nov 90	00:57:00	14.8	6.9	0.6	148.5	10.6
1 Nov 90	00:58:00	17.6	7.3	0.6	145.5	10.3
1 Nov 90	00:59:00	14.9	6.2	0.6	148.2	10.9
1 Nov 90	01:00:00	13.1	4.3	0.7	148.2	12.5

1 Nov 90	01:01:00	21.2	3.9	0.7	144.2	12.9
1 Nov 90	01:02:00	32.6	3.4	0.7	144.4	13.3
1 Nov 90	01:03:00	26.4	4.3	0.6	149.5	12.7
1 Nov 90	01:04:00	13.7	4.7	0.6	150.7	12.3
1 Nov 90	01:05:00	12.6	5.8	0.6	151.7	11.7
1 Nov 90	01:06:00	25.9	7.7	0.7	148.3	10.0
1 Nov 90	01:07:00	31.1	7.7	0.6	146.3	9.9
1 Nov 90	01:08:00	24.7	7.7	0.6	144.2	9.9
1 Nov 90	01:09:00	30.6	8.2	1.1	140.8	9.6
1 Nov 90	01:10:00	62.6	8.7	0.8	136.1	9.2
1 Nov 90	01:11:00	46.1	8.6	0.7	139.2	9.3
	AVERAGE	29.9	7.0	1.1	147.0	10.4
	SPAN GAS VALUE	255.0	6.0	25.0	250.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	0.2	0.0	0.0
	AVERAGE BIAS SPAN	258.0	5.9	24.0	235.0	5.0
	BIAS CORRECTED AVG	28.7	7.2	0.9	156.4	10.4

TEST T-9

19 NOVEMBER 1990

TITLE: RUN 9 - EXPLOSIVES
NOTE : SLURRY/ACETONE

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
19 Nov 90	14:30:00	97.7	6.8	-0.1	89.1	10.2
19 Nov 90	14:31:00	68.1	8.0	-0.1	85.3	9.3
19 Nov 90	14:32:00	48.2	7.3	-0.1	86.0	9.8
19 Nov 90	14:33:00	64.0	7.3	-0.1	88.6	9.9
19 Nov 90	14:34:00	70.1	8.1	-0.1	84.6	9.2
19 Nov 90	14:35:00	41.8	6.6	-0.2	91.0	10.4
19 Nov 90	14:36:00	52.3	8.0	-0.1	87.1	9.3
19 Nov 90	14:37:00	59.5	8.3	-0.1	88.4	9.1
19 Nov 90	14:38:00	49.7	8.1	-0.1	88.8	9.3
19 Nov 90	14:39:00	52.4	8.0	-0.1	89.2	9.4
19 Nov 90	14:40:00	50.4	8.1	-0.1	88.2	9.3
19 Nov 90	14:41:00	51.5	8.0	-0.1	88.8	9.3
19 Nov 90	14:42:00	45.6	8.2	-0.1	88.1	9.2
19 Nov 90	14:43:00	45.7	8.1	-0.1	89.2	9.3
19 Nov 90	14:44:00	43.5	8.0	-0.1	89.8	9.4
19 Nov 90	14:45:00	49.0	8.1	-0.1	88.5	9.2
19 Nov 90	14:46:00	51.9	8.1	-0.1	89.5	9.2
19 Nov 90	14:47:00	44.0	8.0	-0.1	89.7	9.4
19 Nov 90	14:48:00	48.6	7.6	-0.1	88.3	9.6
19 Nov 90	14:49:00	57.6	7.5	-0.1	87.6	9.7
19 Nov 90	14:50:00	48.5	6.7	-0.1	87.2	10.3
19 Nov 90	14:51:00	63.0	7.6	-0.1	87.3	9.6
19 Nov 90	14:52:00	63.5	7.4	-0.1	86.4	9.7
19 Nov 90	14:53:00	62.5	7.6	-0.1	87.4	9.6
19 Nov 90	14:54:00	59.0	7.0	-0.2	89.2	10.1
19 Nov 90	14:55:00	72.5	7.9	-0.1	85.9	9.3
19 Nov 90	14:56:00	56.1	7.1	-0.1	86.7	9.9
19 Nov 90	14:57:00	71.4	7.4	-0.1	89.6	9.8
19 Nov 90	14:58:00	68.8	8.1	-0.1	84.9	9.2
19 Nov 90	14:59:00	47.2	6.8	-0.1	88.1	10.1
19 Nov 90	15:00:00	76.6	7.9	-0.1	87.2	9.4
19 Nov 90	15:01:00	39.1	6.6	-0.1	89.1	10.3
19 Nov 90	15:02:00	42.9	6.8	-0.1	90.2	10.2
19 Nov 90	15:03:00	49.5	7.2	-0.1	88.2	9.9
19 Nov 90	15:04:00	56.6	8.2	-0.1	87.9	9.1
19 Nov 90	15:05:00	53.7	8.3	-0.1	88.5	9.1
19 Nov 90	15:06:00	48.7	8.1	-0.1	89.4	9.2
19 Nov 90	15:07:00	48.0	8.0	-0.1	89.6	9.3
19 Nov 90	15:08:00	44.1	8.0	-0.1	88.9	9.3
19 Nov 90	15:09:00	53.8	8.1	-0.1	88.8	9.2
19 Nov 90	15:10:00	47.9	8.0	-0.1	89.3	9.3
19 Nov 90	15:11:00	45.0	7.8	-0.1	89.1	9.5
19 Nov 90	15:12:00	57.7	7.7	-0.1	88.1	9.6
19 Nov 90	15:13:00	59.9	7.4	-0.1	89.1	9.8
19 Nov 90	15:14:00	52.1	7.4	-0.1	86.2	9.8
19 Nov 90	15:15:00	61.3	7.5	-0.1	87.6	9.7
19 Nov 90	15:16:00	65.2	7.3	-0.1	85.9	9.8
19 Nov 90	15:17:00	64.2	7.5	-0.1	86.9	9.7
19 Nov 90	15:18:00	63.1	7.3	-0.2	89.3	9.9
19 Nov 90	15:19:00	52.3	7.7	-0.1	84.3	9.4
19 Nov 90	15:20:00	63.9	7.1	-0.2	90.3	10.0
19 Nov 90	15:21:00	71.2	8.1	-0.1	85.2	9.2
19 Nov 90	15:22:00	48.6	6.9	-0.1	86.8	10.1
19 Nov 90	15:23:00	76.3	7.8	-0.1	88.0	9.5
19 Nov 90	15:24:00	54.2	7.8	-0.1	84.7	9.4
19 Nov 90	15:25:00	62.9	7.0	-0.1	88.7	10.1
19 Nov 90	15:26:00	45.2	6.7	-0.1	88.6	10.3
19 Nov 90	15:27:00	44.5	6.7	-0.1	88.6	10.3
19 Nov 90	15:28:00	52.7	7.6	-0.1	86.9	9.6
19 Nov 90	15:29:00	65.3	8.4	-0.1	85.5	9.0
19 Nov 90	15:30:00	69.6	8.3	-0.1	86.5	9.1
19 Nov 90	15:31:00	60.3	8.2	-0.1	87.5	9.2
19 Nov 90	15:32:00	53.3	8.1	-0.1	88.5	9.3
19 Nov 90	15:33:00	53.9	8.2	-0.1	87.0	9.2
19 Nov 90	15:34:00	64.1	8.3	-0.1	86.9	9.1
19 Nov 90	15:35:00	54.4	8.1	-0.1	87.8	9.2
19 Nov 90	15:36:00	48.2	8.0	-0.1	88.4	9.3
19 Nov 90	15:37:00	48.5	7.8	-0.1	87.9	9.5
19 Nov 90	15:38:00	62.6	7.6	-0.1	85.9	9.6
19 Nov 90	15:39:00	78.0	6.9	-0.1	85.8	10.1
19 Nov 90	15:40:00	85.4	7.6	-0.1	85.0	9.6
19 Nov 90	15:41:00	75.8	7.8	-0.1	86.3	9.5

19 Nov 90	15:42:00	79.6	7.3	-0.1	86.5	9.8
19 Nov 90	15:43:00	75.2	7.1	-0.1	87.0	9.9
19 Nov 90	15:44:00	82.5	7.3	-0.1	85.7	9.8
19 Nov 90	15:45:00	76.6	8.6	-0.1	86.1	8.9
19 Nov 90	15:46:00	82.9	7.0	-0.1	86.6	10.0
19 Nov 90	15:47:00	74.9	7.8	-0.1	89.0	9.5
19 Nov 90	15:48:00	115.8	7.5	-0.1	87.3	9.7
19 Nov 90	15:49:00	139.0	7.0	-0.1	87.7	10.0
19 Nov 90	15:50:00	111.1	7.2	-0.1	85.8	9.9
19 Nov 90	15:51:00	88.2	7.3	-0.1	85.4	9.8
19 Nov 90	15:52:00	71.6	7.4	-0.1	86.5	9.8
19 Nov 90	15:53:00	70.3	6.5	-0.1	87.7	10.4
19 Nov 90	15:54:00	83.2	8.9	-0.1	82.8	8.6
19 Nov 90	15:55:00	48.8	7.7	-0.1	89.7	9.5
19 Nov 90	15:56:00	65.4	8.3	-0.1	85.9	9.1
19 Nov 90	15:57:00	60.5	7.5	-0.1	86.1	9.7
19 Nov 90	15:58:00	96.4	7.3	-0.1	85.6	9.8
19 Nov 90	15:59:00	91.0	7.1	-0.1	85.2	9.9
19 Nov 90	16:00:00	117.9	7.4	-0.1	84.1	9.7
19 Nov 90	16:01:00	95.1	7.8	-0.1	86.5	9.5
19 Nov 90	16:02:00	87.0	7.3	-0.1	86.7	9.8
19 Nov 90	16:03:00	107.0	7.6	-0.1	86.0	9.5
19 Nov 90	16:04:00	65.7	8.3	-0.1	88.2	9.1
19 Nov 90	16:05:00	69.6	7.3	-0.1	87.4	9.8
19 Nov 90	16:06:00	114.1	7.7	-0.1	87.2	9.5
19 Nov 90	16:07:00	88.1	7.6	-0.1	86.4	9.7
19 Nov 90	16:08:00	133.4	7.4	-0.1	86.6	9.8
19 Nov 90	16:09:00	153.2	6.8	-0.1	85.8	10.2
19 Nov 90	16:10:00	96.9	7.6	-0.1	86.7	9.6
19 Nov 90	16:11:00	94.7	7.6	-0.1	87.3	9.6
19 Nov 90	16:12:00	80.6	7.5	-0.2	88.0	9.7
19 Nov 90	16:13:00	145.9	6.8	-0.1	84.9	10.2
19 Nov 90	16:14:00	91.3	8.5	-0.1	84.3	8.9
19 Nov 90	16:15:00	96.7	7.8	-0.1	92.5	9.5
19 Nov 90	16:16:00	163.1	6.5	-0.1	198.6	10.4
19 Nov 90	16:17:00	563.8	5.3	0.6	300.8	11.4
19 Nov 90	16:18:00	333.3	6.0	0.2	374.5	10.9
19 Nov 90	16:19:00	108.7	7.0	-0.1	396.4	10.2
19 Nov 90	16:20:00	59.4	6.7	-0.1	326.7	10.3
19 Nov 90	16:21:00	213.0	5.9	-0.1	290.9	10.9
19 Nov 90	16:22:00	318.1	6.0	0.1	294.1	10.8
19 Nov 90	16:23:00	327.2	6.2	0.1	290.3	10.7
19 Nov 90	16:24:00	741.8	6.5	40.1	164.9	10.4
19 Nov 90	16:25:00	207.4	7.6	0.3	83.3	9.6
19 Nov 90	16:26:00	25.8	8.2	12.1	92.1	9.1
19 Nov 90	16:27:00	756.0	5.2	5.3	259.9	11.5
19 Nov 90	16:28:00	835.4	4.6	2.6	380.4	11.9
19 Nov 90	16:29:00	516.3	5.8	1.4	439.7	11.1
19 Nov 90	16:30:00	842.6	4.1	8.4	381.4	12.3
19 Nov 90	16:31:00	737.3	4.8	1.0	331.3	11.8
19 Nov 90	16:32:00	352.9	6.9	-0.1	275.1	10.2
19 Nov 90	16:33:00	263.1	4.9	-0.0	199.7	11.7
19 Nov 90	16:34:00	124.3	7.1	-0.1	182.6	10.0
19 Nov 90	16:35:00	66.3	7.9	-0.1	136.6	9.4
19 Nov 90	16:36:00	68.5	7.0	-0.1	269.0	10.1
19 Nov 90	16:37:00	86.7	6.8	-0.1	226.2	10.2
19 Nov 90	16:38:00	340.0	6.3	0.8	256.1	10.6
19 Nov 90	16:39:00	313.8	6.0	0.5	300.0	10.9
19 Nov 90	16:40:00	443.3	5.2	0.3	298.1	11.4
19 Nov 90	16:41:00	235.7	6.4	-0.1	247.3	10.5
19 Nov 90	16:42:00	153.8	6.3	5.1	236.3	10.6
19 Nov 90	16:43:00	820.9	4.2	7.9	341.8	12.3
19 Nov 90	16:44:00	701.5	5.8	0.1	323.2	11.0
19 Nov 90	16:45:00	237.2	7.0	38.7	290.0	10.0
19 Nov 90	16:46:00	531.4	8.1	1.6	84.3	9.2
19 Nov 90	16:47:00	24.4	8.2	0.1	83.3	9.1
19 Nov 90	16:48:00	364.3	6.7	33.4	208.8	10.3
19 Nov 90	16:49:00	409.9	6.6	0.2	166.6	10.3
19 Nov 90	16:50:00	75.3	7.1	0.0	133.8	10.0
19 Nov 90	16:51:00	71.6	7.2	-0.0	146.3	9.9
19 Nov 90	16:52:00	162.0	6.7	17.0	129.1	10.2
19 Nov 90	16:53:00	502.6	8.7	0.3	78.6	8.8
19 Nov 90	16:54:00	27.9	7.9	-0.1	82.5	9.3
19 Nov 90	16:55:00	25.5	7.6	-0.1	134.1	9.6
19 Nov 90	16:56:00	54.7	8.3	-0.1	109.9	9.1
19 Nov 90	16:57:00	88.1	9.0	0.0	87.9	8.6
19 Nov 90	16:58:00	76.0	7.5	-0.1	100.3	9.7
19 Nov 90	16:59:00	69.7	7.1	-0.1	98.6	10.0
19 Nov 90	17:00:00	82.6	7.0	-0.1	97.1	10.0

19 Nov 90	17:01:00	72.8	7.4	-0.1	99.4	9.8
19 Nov 90	17:02:00	113.3	7.6	-0.1	107.3	9.7
19 Nov 90	17:03:00	85.5	7.1	-0.2	91.7	10.0
19 Nov 90	17:04:00	21.5	7.9	-0.2	82.6	9.4
19 Nov 90	17:05:00	25.1	8.0	-0.2	99.5	9.3
19 Nov 90	17:06:00	93.2	7.4	-0.1	107.7	9.8
19 Nov 90	17:07:00	123.9	6.8	-0.1	89.3	10.1
19 Nov 90	17:08:00	108.4	7.1	-0.1	90.8	10.0
19 Nov 90	17:09:00	107.1	8.1	-0.1	85.8	9.2
19 Nov 90	17:10:00	104.6	7.5	-0.1	85.1	9.6
19 Nov 90	17:11:00	99.7	7.1	-0.1	85.9	10.0
19 Nov 90	17:12:00	67.4	8.0	-0.2	92.0	9.3
19 Nov 90	17:13:00	7.4	7.0	-0.2	93.8	10.1
19 Nov 90	17:14:00	8.8	7.7	-0.2	87.6	9.6
19 Nov 90	17:15:00	45.5	8.1	-0.1	107.1	9.2
19 Nov 90	17:16:00	72.1	8.0	-0.1	89.8	9.3
19 Nov 90	17:17:00	71.8	8.0	-0.1	93.0	9.4
19 Nov 90	17:18:00	75.2	7.7	-0.1	92.2	9.6
19 Nov 90	17:19:00	86.1	7.6	-0.1	88.7	9.6
19 Nov 90	17:20:00	94.0	7.3	-0.1	90.1	9.9
19 Nov 90	17:21:00	72.3	7.3	-0.1	87.4	9.8
19 Nov 90	17:22:00	68.9	8.0	-0.1	87.2	9.3
19 Nov 90	17:23:00	37.2	7.8	-0.2	88.2	9.4
19 Nov 90	17:24:00	53.9	8.2	-0.1	90.0	9.2
19 Nov 90	17:25:00	50.5	7.8	-0.1	82.2	9.4
19 Nov 90	17:26:00	69.7	7.5	-0.1	89.7	9.7
19 Nov 90	17:27:00	311.4	6.3	68.1	243.4	10.1
19 Nov 90	17:28:00	155.4	1.3	74.5	421.6	13.6
19 Nov 90	17:29:00	554.6	1.3	112.2	425.9	13.6
19 Nov 90	17:30:00	1000.0	-0.1	135.0	560.8	12.5
19 Nov 90	17:31:00	1000.0	-0.1	135.0	515.8	12.8
19 Nov 90	17:32:00	1000.0	-0.1	135.0	609.4	12.5
19 Nov 90	17:33:00	1000.0	-0.1	135.0	612.1	12.7
19 Nov 90	17:34:00	1000.0	-0.1	135.0	554.5	12.9
19 Nov 90	17:35:00	1000.0	-0.1	135.0	605.2	12.1
19 Nov 90	17:36:00	1000.0	-0.1	135.0	567.3	12.8
19 Nov 90	17:37:00	1000.0	0.1	128.2	541.5	14.4
19 Nov 90	17:38:00	1000.0	0.1	100.5	576.3	14.7
19 Nov 90	17:39:00	1000.0	0.9	92.5	693.6	14.3
19 Nov 90	17:40:00	1000.0	0.4	49.4	653.9	15.3
19 Nov 90	17:41:00	1000.0	0.8	90.1	625.4	14.2
19 Nov 90	17:42:00	1000.0	-0.1	135.0	451.3	13.2
19 Nov 90	17:43:00	1000.0	0.2	104.3	422.4	13.8
19 Nov 90	17:44:00	394.9	3.1	12.4	460.1	13.1
19 Nov 90	17:45:00	872.4	1.3	119.2	394.1	13.7
19 Nov 90	17:46:00	1000.0	0.3	100.1	428.1	14.1
19 Nov 90	17:47:00	1000.0	3.0	105.6	318.7	12.3
19 Nov 90	17:48:00	1000.0	7.5	13.6	95.4	9.6
19 Nov 90	17:49:00	1000.0	7.6	11.9	94.4	9.6
19 Nov 90	17:50:00	407.1	5.4	33.7	287.1	11.2
19 Nov 90	17:51:00	129.1	6.7	4.1	186.3	10.2
19 Nov 90	17:52:00	589.0	3.2	58.1	421.1	12.9
19 Nov 90	17:53:00	154.0	3.2	23.2	616.6	12.8
19 Nov 90	17:54:00	674.2	1.3	81.0	478.9	14.4
19 Nov 90	17:55:00	1000.0	0.4	60.9	517.0	14.9
19 Nov 90	17:56:00	542.2	3.9	3.1	819.9	12.7
19 Nov 90	17:57:00	77.0	6.5	2.1	910.7	10.8
19 Nov 90	17:58:00	32.2	7.2	1.7	915.7	10.3
19 Nov 90	17:59:00	168.6	6.8	48.7	768.5	10.3
19 Nov 90	18:00:00	134.1	2.9	61.7	726.7	12.6
19 Nov 90	18:01:00	342.4	5.6	3.0	967.9	11.6
19 Nov 90	18:02:00	34.6	7.0	1.9	1032.3	10.5
19 Nov 90	18:03:00	29.3	7.6	1.4	1050.4	10.0
19 Nov 90	18:04:00	30.8	6.0	1.2	954.7	11.3
19 Nov 90	18:05:00	24.4	6.7	1.1	990.0	10.8
19 Nov 90	18:06:00	29.2	6.2	1.0	1012.6	11.2
19 Nov 90	18:07:00	26.4	6.2	0.9	966.8	11.3
19 Nov 90	18:08:00	34.1	5.1	0.8	910.6	12.1
19 Nov 90	18:09:00	288.2	4.5	1.3	785.1	12.6
19 Nov 90	18:10:00	973.8	2.2	1.6	594.7	14.2
19 Nov 90	18:11:00	973.9	2.7	0.9	614.3	13.9
19 Nov 90	18:12:00	973.9	2.9	0.7	614.0	13.7
19 Nov 90	18:13:00	913.6	3.6	0.6	760.5	13.1
19 Nov 90	18:14:00	153.5	7.2	0.5	1071.4	10.4
19 Nov 90	18:15:00	25.1	7.4	0.4	1077.6	10.2
19 Nov 90	18:16:00	19.3	6.6	0.4	1089.8	10.8
19 Nov 90	18:17:00	19.0	6.9	0.4	1023.1	10.6
19 Nov 90	18:18:00	23.0	6.0	0.3	967.2	11.4
19 Nov 90	18:19:00	22.0	6.5	0.3	1050.5	10.9

19 Nov 90	18:20:00	23.5	7.0	0.3	1074.6	10.5
19 Nov 90	18:21:00	126.6	5.3	0.3	781.0	12.0
19 Nov 90	18:22:00	321.7	3.9	0.3	670.9	13.0
19 Nov 90	18:23:00	549.2	1.9	10.4	557.2	14.4
19 Nov 90	18:24:00	436.5	1.7	3.4	565.0	14.5
19 Nov 90	18:25:00	144.5	1.7	3.6	556.8	14.5
19 Nov 90	18:26:00	557.0	2.2	1.1	600.2	14.1
19 Nov 90	18:27:00	971.8	3.0	0.5	630.9	13.6
19 Nov 90	18:28:00	898.9	2.6	1.1	614.9	13.9
19 Nov 90	18:29:00	820.9	3.0	6.3	623.0	13.7
19 Nov 90	18:30:00	629.4	1.9	5.6	601.0	14.3
19 Nov 90	18:31:00	727.9	1.1	35.0	567.5	14.6
19 Nov 90	18:32:00	637.0	4.2	10.2	681.8	12.6
19 Nov 90	18:33:00	718.4	3.1	1.1	682.6	13.4
19 Nov 90	18:34:00	312.9	7.2	6.1	628.3	10.1
19 Nov 90	18:35:00	679.3	6.7	37.1	181.5	10.3
19 Nov 90	18:36:00	191.2	7.3	0.8	86.2	9.8
19 Nov 90	18:37:00	15.9	7.3	7.7	90.5	9.8
19 Nov 90	18:38:00	541.6	6.4	2.4	150.1	10.5
19 Nov 90	18:39:00	45.4	6.4	0.2	132.6	10.4
19 Nov 90	18:40:00	36.1	6.5	0.1	144.1	10.4
19 Nov 90	18:41:00	43.6	6.3	0.1	144.0	10.5
19 Nov 90	18:42:00	35.6	6.6	0.0	129.7	10.3
19 Nov 90	18:43:00	33.8	6.6	0.0	121.3	10.4
19 Nov 90	18:44:00	43.9	6.3	0.0	147.2	10.5
19 Nov 90	18:45:00	38.8	6.6	0.0	119.8	10.4
19 Nov 90	18:46:00	41.3	6.5	0.0	113.5	10.4
19 Nov 90	18:47:00	37.8	6.6	0.0	99.6	10.3
19 Nov 90	18:48:00	38.3	6.7	-0.0	91.7	10.3
19 Nov 90	18:49:00	39.5	6.5	0.0	91.6	10.3
19 Nov 90	18:50:00	41.3	6.5	0.0	88.9	10.4
19 Nov 90	18:51:00	41.2	6.5	0.0	88.1	10.4
19 Nov 90	18:52:00	42.6	6.4	4.4	150.1	10.5
19 Nov 90	18:53:00	436.3	3.9	95.4	317.6	12.1
19 Nov 90	18:54:00	346.0	7.2	8.0	91.0	9.8
19 Nov 90	18:55:00	20.4	7.1	3.1	111.6	9.9
19 Nov 90	18:56:00	681.9	6.1	13.5	194.9	10.6
19 Nov 90	18:57:00	87.1	6.3	0.7	169.0	10.5
19 Nov 90	18:58:00	36.1	6.5	0.4	145.6	10.4
19 Nov 90	18:59:00	33.7	6.6	0.3	139.5	10.3
19 Nov 90	19:00:00	36.2	6.7	0.2	112.3	10.2
19 Nov 90	19:01:00	41.7	6.6	0.1	108.5	10.3
19 Nov 90	19:02:00	41.9	6.7	0.1	90.0	10.2
19 Nov 90	19:03:00	37.5	6.8	0.1	89.0	10.2
19 Nov 90	19:04:00	37.3	6.7	0.1	88.3	10.2
19 Nov 90	19:05:00	40.3	6.6	0.0	87.8	10.3
19 Nov 90	19:06:00	42.6	6.5	0.1	156.5	10.4
19 Nov 90	19:07:00	517.2	1.5	109.1	384.0	13.5
19 Nov 90	19:08:00	1000.0	0.9	66.7	530.4	14.5
19 Nov 90	19:09:00	1000.0	0.1	133.3	468.0	14.0
19 Nov 90	19:10:00	1000.0	0.2	125.1	484.0	14.2
19 Nov 90	19:11:00	1000.0	-0.0	135.0	544.9	13.6
19 Nov 90	19:12:00	1000.0	0.0	121.7	517.9	14.5
19 Nov 90	19:13:00	1000.0	0.8	25.1	602.0	15.1
19 Nov 90	19:14:00	724.6	2.6	2.6	763.1	14.1
19 Nov 90	19:15:00	292.5	3.9	1.7	886.6	13.1
19 Nov 90	19:16:00	965.5	2.3	3.3	823.0	14.3
19 Nov 90	19:17:00	1000.0	0.5	112.7	807.2	13.9
19 Nov 90	19:18:00	1000.0	0.0	135.1	861.3	12.8
19 Nov 90	19:19:00	1000.0	-0.0	135.0	756.6	13.3
19 Nov 90	19:20:00	1000.0	0.0	89.9	656.4	15.1
19 Nov 90	19:21:00	1000.0	0.2	27.3	752.9	15.9
19 Nov 90	19:22:00	408.7	3.2	5.7	1424.8	13.9
19 Nov 90	19:23:00	394.3	3.0	75.2	1142.1	13.2
19 Nov 90	19:24:00	550.8	1.4	88.3	665.4	14.4
19 Nov 90	19:25:00	77.5	0.4	27.4	715.0	15.4
19 Nov 90	19:26:00	268.5	3.3	2.3	1229.2	13.6
19 Nov 90	19:27:00	120.3	4.6	2.9	1199.1	12.6
19 Nov 90	19:28:00	767.5	0.8	11.5	577.1	15.2
19 Nov 90	19:29:00	724.3	1.6	5.5	719.7	14.6
19 Nov 90	19:30:00	464.3	5.9	1.0	1004.0	11.3
19 Nov 90	19:31:00	32.1	7.4	1.0	1054.3	10.1
19 Nov 90	19:32:00	66.9	7.6	0.7	833.5	9.9
19 Nov 90	19:33:00	472.0	3.2	75.8	604.5	12.2
19 Nov 90	19:34:00	74.9	0.0	135.1	810.1	11.6
19 Nov 90	19:35:00	1.1	0.0	135.0	791.8	11.6
19 Nov 90	19:36:00	0.9	0.0	125.9	653.3	14.2
19 Nov 90	19:37:00	302.6	1.4	32.0	848.7	15.0
19 Nov 90	19:38:00	973.3	1.9	18.2	883.9	14.8

19 Nov 90	19:39:00	738.0	2.3	11.9	975.4	14.5
19 Nov 90	19:40:00	487.5	2.7	8.5	1024.4	14.2
19 Nov 90	19:41:00	184.8	4.1	7.6	1253.7	13.1
19 Nov 90	19:42:00	530.4	1.3	25.0	594.1	14.8
19 Nov 90	19:43:00	473.4	3.2	4.1	729.9	13.6
19 Nov 90	19:44:00	159.1	3.9	7.8	731.9	13.0
19 Nov 90	19:45:00	670.7	0.5	46.3	528.0	15.1
19 Nov 90	19:46:00	195.1	0.5	30.4	530.3	15.2
19 Nov 90	19:47:00	450.8	0.4	46.0	524.2	15.2
19 Nov 90	19:48:00	237.8	0.4	44.5	545.5	15.1
19 Nov 90	19:49:00	348.5	3.2	2.4	767.4	13.5
19 Nov 90	19:50:00	93.2	4.7	1.7	845.8	12.3
19 Nov 90	19:51:00	42.5	4.9	1.4	859.1	12.2
19 Nov 90	19:52:00	35.0	5.3	1.2	899.7	11.9
19 Nov 90	19:53:00	29.6	5.5	1.0	895.5	11.7
19 Nov 90	19:54:00	27.5	5.5	0.9	940.5	11.7
19 Nov 90	19:55:00	26.9	5.5	1.1	951.4	11.7
19 Nov 90	19:56:00	25.8	5.8	0.8	916.3	11.4
19 Nov 90	19:57:00	24.1	5.8	0.7	936.1	11.5
19 Nov 90	19:58:00	23.8	5.9	0.6	940.0	11.3
19 Nov 90	19:59:00	525.4	3.7	0.7	740.7	13.2
19 Nov 90	20:00:00	362.5	5.6	0.5	922.4	11.6
19 Nov 90	20:01:00	23.6	6.2	0.4	940.9	11.1
19 Nov 90	20:02:00	21.4	6.9	0.4	987.4	10.5
19 Nov 90	20:03:00	90.0	9.0	0.7	915.7	8.8
19 Nov 90	20:04:00	50.0	5.5	0.5	895.3	11.8
19 Nov 90	20:05:00	727.9	2.9	0.6	687.9	13.9
19 Nov 90	20:06:00	295.6	5.1	0.3	890.4	12.0
19 Nov 90	20:07:00	69.5	4.5	0.3	803.1	12.6
19 Nov 90	20:08:00	40.6	5.6	0.3	890.6	11.6
19 Nov 90	20:09:00	27.0	7.9	0.2	991.1	9.8
19 Nov 90	20:10:00	29.7	8.1	0.2	990.6	9.7
19 Nov 90	20:11:00	225.9	5.4	70.9	783.5	11.3
19 Nov 90	20:12:00	147.2	0.1	130.4	572.3	14.0
19 Nov 90	20:13:00	328.6	5.3	9.4	927.5	11.6
19 Nov 90	20:14:00	323.5	6.5	63.3	901.4	10.4
19 Nov 90	20:15:00	1000.0	0.1	135.1	580.3	13.9
19 Nov 90	20:16:00	1000.0	0.0	124.4	549.0	14.5
19 Nov 90	20:17:00	304.8	5.6	64.0	889.8	10.8
19 Nov 90	20:18:00	1000.0	0.1	135.0	626.4	13.5
19 Nov 90	20:19:00	1000.0	0.0	135.0	781.1	12.8
19 Nov 90	20:20:00	1000.0	0.0	135.0	609.0	13.6
19 Nov 90	20:21:00	1000.0	0.1	114.4	549.3	14.3
19 Nov 90	20:22:00	208.8	8.1	87.9	528.4	8.8
	AVERAGE	275.8	5.6	18.4	370.8	11.0
	SPAN GAS VALUE	255.0	6.0	25.0	803.0	5.0
	AVERAGE BIAS ZERO	1.4	0.1	0.4	3.5	0.0
	AVERAGE BIAS SPAN	260.0	5.9	23.0	826.5	5.0
	BIAS CORRECTED AVG	270.6	5.7	19.9	358.3	11.0

TITLE: TEST #9 (CON'T)
NOTE : ACETONE RUN 9 A

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
29 Nov 90	17:30:00	38.5	8.9		78.5	9.1
29 Nov 90	17:31:00	42.1	8.9		78.1	9.1
29 Nov 90	17:32:00	40.0	9.0		78.3	9.1
29 Nov 90	17:33:00	42.9	9.0		78.5	9.0
29 Nov 90	17:34:00	43.7	9.0		78.4	9.0
29 Nov 90	17:35:00	45.4	8.9		88.0	9.3
29 Nov 90	17:36:00	57.9	6.2		142.2	11.7
29 Nov 90	17:37:00	101.3	7.2		73.7	11.0
29 Nov 90	17:38:00	543.7	1.3		65.7	14.9
29 Nov 90	17:39:00	1000.0	0.7		65.3	15.0
29 Nov 90	17:40:00	1000.0	1.7		73.4	14.4
29 Nov 90	17:41:00	783.1	3.2		80.2	14.3
29 Nov 90	17:42:00	974.0	2.9		80.8	14.5
29 Nov 90	17:43:00	481.0	2.0		78.3	15.2
29 Nov 90	17:44:00	806.4	2.3		79.4	14.9
29 Nov 90	17:45:00	973.9	2.3		80.0	14.8
29 Nov 90	17:46:00	973.9	2.7		79.9	14.4
29 Nov 90	17:47:00	425.2	3.8		87.9	13.9
29 Nov 90	17:48:00	1000.0	3.9		87.5	13.8
29 Nov 90	17:49:00	1000.0	2.4		53.0	12.2
29 Nov 90	17:50:00	1000.0	0.5		43.8	12.8
29 Nov 90	17:51:00	1000.0	0.5		49.0	13.0
29 Nov 90	17:52:00	1000.0	0.5		52.5	13.3
29 Nov 90	17:53:00	1000.0	0.5		57.4	13.7
29 Nov 90	17:54:00	1000.0	0.6		58.9	13.7
29 Nov 90	17:55:00	1000.0	0.6		58.3	13.7
29 Nov 90	17:56:00	1000.0	0.6		62.8	14.1
29 Nov 90	17:57:00	1000.0	0.6		61.3	14.0
29 Nov 90	17:58:00	1000.0	0.6		65.7	14.4
29 Nov 90	17:59:00	1000.0	0.6		69.2	14.7
29 Nov 90	18:00:00	1000.0	0.6		70.6	14.8
29 Nov 90	18:01:00	1000.0	1.1		81.8	15.5
29 Nov 90	18:02:00	635.0	1.1		81.0	15.6
29 Nov 90	18:03:00	472.2	1.1		81.6	15.7
29 Nov 90	18:04:00	810.8	1.3		84.1	15.5
29 Nov 90	18:05:00	789.6	1.6		77.0	14.8
29 Nov 90	18:06:00	156.0	0.7		68.9	14.7
29 Nov 90	18:07:00	125.5	0.8		72.7	15.2
29 Nov 90	18:08:00	138.9	0.9		76.0	15.3
29 Nov 90	18:09:00	615.1	0.9		75.8	15.3
29 Nov 90	18:10:00	787.8	1.1		78.2	15.4
29 Nov 90	18:11:00	309.3	1.3		81.0	15.4
29 Nov 90	18:12:00	973.2	1.4		80.1	15.4
29 Nov 90	18:13:00	697.9	1.7		82.7	15.1
29 Nov 90	18:14:00	967.5	2.1		82.2	14.9
29 Nov 90	18:15:00	812.6	1.7		76.5	14.8
29 Nov 90	18:16:00	318.4	0.8		72.9	14.9
29 Nov 90	18:17:00	305.3	1.0		75.9	15.1
29 Nov 90	18:18:00	653.1	1.4		79.2	15.1
29 Nov 90	18:19:00	932.4	1.6		79.5	15.0
29 Nov 90	18:20:00	234.6	1.9		80.7	14.8
29 Nov 90	18:21:00	807.2	2.2		81.0	14.7
29 Nov 90	18:22:00	973.9	2.1		81.9	14.8
29 Nov 90	18:23:00	973.9	2.2		81.8	14.6
29 Nov 90	18:24:00	974.0	2.4		82.8	14.5
29 Nov 90	18:25:00	973.9	2.7		82.3	14.2
29 Nov 90	18:26:00	649.5	3.1		82.6	14.1
29 Nov 90	18:27:00	655.0	3.1		82.7	14.0
29 Nov 90	18:28:00	353.3	4.3		82.7	13.0
29 Nov 90	18:29:00	42.0	5.1		81.7	12.5
29 Nov 90	18:30:00	30.0	5.2		81.0	12.4
29 Nov 90	18:31:00	27.5	5.2		81.0	12.4
29 Nov 90	18:32:00	27.4	5.4		80.3	12.3
29 Nov 90	18:33:00	26.6	5.4		81.1	12.2
29 Nov 90	18:34:00	27.1	5.5		80.0	12.2
29 Nov 90	18:35:00	385.3	3.8		79.3	13.9
29 Nov 90	18:36:00	973.5	2.8		80.4	14.1
29 Nov 90	18:37:00	489.7	3.4		81.0	13.8
29 Nov 90	18:38:00	303.1	3.6		80.4	13.8
29 Nov 90	18:39:00	340.7	3.6		80.5	13.7
29 Nov 90	18:40:00	285.2	3.6		79.7	13.7
29 Nov 90	18:41:00	240.5	3.8		80.9	13.6

29 Nov 90	18:42:00	178.0	3.9	80.7	13.5
29 Nov 90	18:43:00	180.3	4.0	80.0	13.4
29 Nov 90	18:44:00	181.5	3.8	80.1	13.5
29 Nov 90	18:45:00	150.4	4.1	80.0	13.3
29 Nov 90	18:46:00	109.5	4.3	80.5	13.1
29 Nov 90	18:47:00	92.1	4.3	80.7	13.2
29 Nov 90	18:48:00	135.2	4.0	81.1	13.4
29 Nov 90	18:49:00	138.0	4.0	81.7	13.4
29 Nov 90	18:50:00	121.0	4.0	81.1	13.4
29 Nov 90	18:51:00	193.4	3.9	81.3	13.5
29 Nov 90	18:52:00	164.5	3.9	81.5	13.4
29 Nov 90	18:53:00	89.1	4.3	81.0	13.2
29 Nov 90	18:54:00	80.4	4.2	81.7	13.3
29 Nov 90	18:55:00	97.0	4.2	81.0	13.3
29 Nov 90	18:56:00	103.1	4.2	81.2	13.3
29 Nov 90	18:57:00	97.2	4.2	81.1	13.3
29 Nov 90	18:58:00	96.3	4.3	81.1	13.1
29 Nov 90	18:59:00	61.7	4.5	81.5	13.0
29 Nov 90	19:00:00	50.8	4.6	81.3	12.9
29 Nov 90	19:01:00	51.2	4.6	81.5	12.9
29 Nov 90	19:02:00	44.7	4.8	81.5	12.8
29 Nov 90	19:03:00	43.7	4.8	81.6	12.7
29 Nov 90	19:04:00	38.6	4.9	80.4	12.7
29 Nov 90	19:05:00	38.5	5.0	80.9	12.6
29 Nov 90	19:06:00	29.5	5.1	81.6	12.5
29 Nov 90	19:07:00	29.5	5.3	81.3	12.4
29 Nov 90	19:08:00	26.2	5.3	80.7	12.3
29 Nov 90	19:09:00	24.0	5.4	80.6	12.3
29 Nov 90	19:10:00	25.9	5.4	81.0	12.2
29 Nov 90	19:11:00	25.2	5.5	80.9	12.1
29 Nov 90	19:12:00	22.8	5.6	80.3	12.1
29 Nov 90	19:13:00	23.1	5.5	80.1	12.3
29 Nov 90	19:14:00	26.1	5.3	80.4	12.4
29 Nov 90	19:15:00	25.9	5.2	81.0	12.5
29 Nov 90	19:16:00	26.0	5.3	81.5	12.4
29 Nov 90	19:17:00	24.5	5.2	81.3	12.5
29 Nov 90	19:18:00	26.9	5.2	81.5	12.5
29 Nov 90	19:19:00	26.9	5.1	81.2	12.5
29 Nov 90	19:20:00	25.7	5.2	81.4	12.5
29 Nov 90	19:21:00	25.9	5.2	81.3	12.4
29 Nov 90	19:22:00	27.6	5.1	81.4	12.5
29 Nov 90	19:23:00	27.6	5.2	81.4	12.4
29 Nov 90	19:24:00	26.3	5.2	81.0	12.5
29 Nov 90	19:25:00	25.9	5.2	80.6	12.4
29 Nov 90	19:26:00	24.5	5.3	81.6	12.3
29 Nov 90	19:27:00	22.8	5.4	81.3	12.3
29 Nov 90	19:28:00	23.1	5.5	80.8	12.2
29 Nov 90	19:29:00	25.0	5.5	80.0	12.2
29 Nov 90	19:30:00	22.8	5.5	80.1	12.2
29 Nov 90	19:31:00	22.6	5.6	80.7	12.1
29 Nov 90	19:32:00	23.6	5.6	79.9	12.1
29 Nov 90	19:33:00	23.7	5.7	79.9	12.0
29 Nov 90	19:34:00	25.5	5.7	79.8	12.0
29 Nov 90	19:35:00	23.5	5.7	79.4	12.0
29 Nov 90	19:36:00	33.0	5.3	80.3	12.6
29 Nov 90	19:37:00	96.5	4.4	81.1	13.1
29 Nov 90	19:38:00	73.5	4.4	81.3	13.2
29 Nov 90	19:39:00	133.5	4.1	82.1	13.4
29 Nov 90	19:40:00	206.5	3.8	82.0	13.6
29 Nov 90	19:41:00	247.9	3.7	82.0	13.7
29 Nov 90	19:42:00	324.1	3.6	81.9	13.8
29 Nov 90	19:43:00	313.8	3.5	81.6	13.8
29 Nov 90	19:44:00	318.0	3.5	81.8	13.8
29 Nov 90	19:45:00	232.7	3.8	82.5	13.5
29 Nov 90	19:46:00	94.2	4.2	82.3	13.3
29 Nov 90	19:47:00	67.6	4.2	83.4	13.2
29 Nov 90	19:48:00	55.8	4.3	83.0	13.2
29 Nov 90	19:49:00	58.7	4.4	82.3	13.1
29 Nov 90	19:50:00	50.8	4.5	82.0	13.0
29 Nov 90	19:51:00	52.2	4.5	82.2	13.0
29 Nov 90	19:52:00	50.9	4.5	81.8	13.0
29 Nov 90	19:53:00	56.5	4.5	82.0	13.0
29 Nov 90	19:54:00	52.6	4.6	81.2	12.9
29 Nov 90	19:55:00	42.9	4.7	81.0	12.9
29 Nov 90	19:56:00	34.9	4.8	81.8	12.8
29 Nov 90	19:57:00	35.8	4.8	81.9	12.8
29 Nov 90	19:58:00	34.9	4.9	81.0	12.7
29 Nov 90	19:59:00	30.3	5.0	81.0	12.6
29 Nov 90	20:00:00	27.3	5.0	80.4	12.6

29 Nov 90	20:01:00	29.1	5.1	81.0	12.5
29 Nov 90	20:02:00	26.1	5.2	80.4	12.4
29 Nov 90	20:03:00	25.4	5.2	81.3	12.4
29 Nov 90	20:04:00	27.9	5.0	81.2	12.7
29 Nov 90	20:05:00	28.8	4.9	81.5	12.7
29 Nov 90	20:06:00	35.3	4.7	82.0	12.9
29 Nov 90	20:07:00	37.3	4.6	81.1	12.9
29 Nov 90	20:08:00	38.2	4.7	81.8	12.9
29 Nov 90	20:09:00	40.1	4.6	81.9	12.9
29 Nov 90	20:10:00	39.1	4.6	81.9	12.9
29 Nov 90	20:11:00	48.0	4.6	81.4	13.0
29 Nov 90	20:12:00	47.9	4.4	82.1	13.1
29 Nov 90	20:13:00	52.9	4.5	81.8	13.0
29 Nov 90	20:14:00	44.7	4.6	81.2	12.9
29 Nov 90	20:15:00	40.6	4.7	81.5	12.9
29 Nov 90	20:16:00	41.9	4.6	80.9	13.0
29 Nov 90	20:17:00	43.8	4.7	81.8	12.8
29 Nov 90	20:18:00	38.2	4.7	80.8	12.8
29 Nov 90	20:19:00	42.5	4.7	81.1	12.9
29 Nov 90	20:20:00	39.3	4.7	81.0	12.9
29 Nov 90	20:21:00	41.4	4.8	81.2	12.8
29 Nov 90	20:22:00	34.6	4.8	80.5	12.8
29 Nov 90	20:23:00	44.8	4.6	81.3	13.0
29 Nov 90	20:24:00	276.9	3.5	81.2	13.7
29 Nov 90	20:25:00	240.2	5.4	78.6	12.1
29 Nov 90	20:26:00	104.7	6.1	77.6	11.4
29 Nov 90	20:27:00	27.5	6.9	76.9	11.2
29 Nov 90	20:28:00	414.1	3.8	80.7	13.8
29 Nov 90	20:29:00	760.4	3.2	81.2	13.9
29 Nov 90	20:30:00	890.6	2.9	81.1	14.2
29 Nov 90	20:31:00	974.1	2.6	80.3	14.3
29 Nov 90	20:32:00	974.0	4.5	68.4	10.8
29 Nov 90	20:33:00	170.5	13.3	51.0	7.3
29 Nov 90	20:34:00	20.5	5.8	85.8	12.0
29 Nov 90	20:35:00	21.4	5.8	86.2	12.1
29 Nov 90	20:36:00	28.0	5.2	86.5	12.9
29 Nov 90	20:37:00	842.2	2.0	88.5	14.9
29 Nov 90	20:38:00	758.5	4.7	87.7	12.4
29 Nov 90	20:39:00	200.0	4.2	88.1	13.6
29 Nov 90	20:40:00	652.4	10.4	44.0	5.5
29 Nov 90	20:41:00	10.9	12.5	57.0	8.2
29 Nov 90	20:42:00	20.7	6.0	85.9	11.9
29 Nov 90	20:43:00	21.6	6.0	85.6	11.8
29 Nov 90	20:44:00	24.0	6.1	85.3	11.8
29 Nov 90	20:45:00	25.0	6.1	85.1	11.8
29 Nov 90	20:46:00	27.1	6.2	84.9	11.7
29 Nov 90	20:47:00	27.8	6.3	84.4	11.6
29 Nov 90	20:48:00	29.0	6.3	84.1	11.6
29 Nov 90	20:49:00	32.0	6.3	84.2	11.9
29 Nov 90	20:50:00	169.5	4.9	84.2	11.8
29 Nov 90	20:51:00	22.5	16.1	25.7	3.4
29 Nov 90	20:52:00	21.1	6.7	82.3	11.4
29 Nov 90	20:53:00	33.1	6.6	81.9	11.3
29 Nov 90	20:54:00	31.8	6.7	81.9	11.3
29 Nov 90	20:55:00	38.1	6.7	81.7	11.2
29 Nov 90	20:56:00	39.8	6.3	83.9	12.0
29 Nov 90	20:57:00	274.0	4.6	85.9	12.9
29 Nov 90	20:58:00	374.2	4.3	86.3	12.8
29 Nov 90	20:59:00	152.4	4.6	86.9	13.4
29 Nov 90	21:00:00	270.8	5.7	84.4	11.7
29 Nov 90	21:01:00	36.2	6.4	83.9	11.6
29 Nov 90	21:02:00	65.6	5.2	86.4	12.9
29 Nov 90	21:03:00	607.5	2.5	89.8	14.5
29 Nov 90	21:04:00	380.7	5.4	85.1	11.9
29 Nov 90	21:05:00	171.2	8.1	58.0	7.9
29 Nov 90	21:06:00	29.2	13.5	50.2	7.3
29 Nov 90	21:07:00	25.4	6.3	83.9	11.6
29 Nov 90	21:08:00	28.3	6.3	83.8	11.6
29 Nov 90	21:09:00	32.0	6.4	84.7	11.6
29 Nov 90	21:10:00	32.5	6.4	83.6	11.5
29 Nov 90	21:11:00	31.0	6.5	84.0	11.5
29 Nov 90	21:12:00	34.5	6.5	83.4	11.4
29 Nov 90	21:13:00	32.4	6.5	83.1	11.4
29 Nov 90	21:14:00	35.1	6.6	82.1	11.4
29 Nov 90	21:15:00	37.4	6.6	81.5	11.3
29 Nov 90	21:16:00	39.3	6.7	81.4	11.3
29 Nov 90	21:17:00	39.6	6.8	81.4	11.2
29 Nov 90	21:18:00	56.2	5.7	85.0	12.1
29 Nov 90	21:19:00	66.7	6.4	82.0	11.6

29 Nov 90	21:20:00	65.0	6.1	81.8	12.0
29 Nov 90	21:21:00	55.4	6.1	81.8	11.7
29 Nov 90	21:22:00	44.1	4.7	85.6	12.5
29 Nov 90	21:23:00	48.2	7.0	80.2	11.3
29 Nov 90	21:24:00	51.2	5.3	84.6	12.1
29 Nov 90	21:25:00	44.0	7.0	80.3	11.0
29 Nov 90	21:26:00	49.3	5.6	85.6	12.6
29 Nov 90	21:27:00	69.5	3.8	89.6	13.6
29 Nov 90	21:28:00	70.7	3.7	90.1	13.6
29 Nov 90	21:29:00	76.6	3.7	89.5	13.7
29 Nov 90	21:30:00	84.4	3.7	89.9	13.6
29 Nov 90	21:31:00	84.2	3.7	90.5	13.6
29 Nov 90	21:32:00	80.9	3.8	90.4	13.6
29 Nov 90	21:33:00	74.5	3.8	89.6	13.6
29 Nov 90	21:34:00	66.3	3.8	89.6	13.6
29 Nov 90	21:35:00	69.7	3.9	90.2	13.5
29 Nov 90	21:36:00	62.7	3.9	90.6	13.4
29 Nov 90	21:37:00	62.8	3.9	89.5	13.4
29 Nov 90	21:38:00	48.0	4.0	90.1	13.4
29 Nov 90	21:39:00	51.5	4.1	90.7	13.3
29 Nov 90	21:40:00	46.0	4.1	90.5	13.3
29 Nov 90	21:41:00	46.0	4.2	89.2	13.2
29 Nov 90	21:42:00	41.3	4.3	89.7	13.1
29 Nov 90	21:43:00	41.2	4.3	89.1	13.1
29 Nov 90	21:44:00	36.0	4.4	89.3	13.0
29 Nov 90	21:45:00	33.0	4.4	89.4	13.0
29 Nov 90	21:46:00	34.4	4.4	88.8	13.0
29 Nov 90	21:47:00	35.7	4.4	89.1	13.0
29 Nov 90	21:48:00	33.2	4.5	88.9	13.0
29 Nov 90	21:49:00	31.8	4.4	89.5	13.1
29 Nov 90	21:50:00	40.3	4.2	90.1	13.3
29 Nov 90	21:51:00	46.0	4.1	89.6	13.3
29 Nov 90	21:52:00	41.7	4.1	90.3	13.3
29 Nov 90	21:53:00	47.1	4.1	89.8	13.3
29 Nov 90	21:54:00	47.7	4.1	90.1	13.4
29 Nov 90	21:55:00	44.9	4.0	90.7	13.4
29 Nov 90	21:56:00	55.2	4.0	90.7	13.4
29 Nov 90	21:57:00	47.0	4.1	90.7	13.3
29 Nov 90	21:58:00	52.0	4.1	90.6	13.3
29 Nov 90	21:59:00	41.4	4.1	89.4	13.3
29 Nov 90	22:00:00	38.7	4.1	89.6	13.3
29 Nov 90	22:01:00	40.8	4.3	89.8	13.2
29 Nov 90	22:02:00	39.3	4.3	89.9	13.1
29 Nov 90	22:03:00	33.7	4.3	89.8	13.1
29 Nov 90	22:04:00	33.0	4.4	89.9	13.0
29 Nov 90	22:05:00	33.2	4.5	89.1	13.0
29 Nov 90	22:06:00	34.0	4.5	88.8	13.0
29 Nov 90	22:07:00	31.9	4.5	88.6	12.9
29 Nov 90	22:08:00	28.1	4.6	88.4	12.9
29 Nov 90	22:09:00	27.4	4.8	88.9	12.8
29 Nov 90	22:10:00	28.9	4.7	88.7	12.8
29 Nov 90	22:11:00	28.8	4.8	88.5	12.7
29 Nov 90	22:12:00	27.7	4.9	88.9	12.7
29 Nov 90	22:13:00	25.2	4.9	88.7	12.7
29 Nov 90	22:14:00	21.9	4.9	88.3	12.6
29 Nov 90	22:15:00	25.4	4.8	90.1	12.8
29 Nov 90	22:16:00	30.4	4.6	89.6	12.9
29 Nov 90	22:17:00	24.8	4.6	90.1	12.9
29 Nov 90	22:18:00	27.9	4.5	90.7	13.0
29 Nov 90	22:19:00	31.3	4.5	90.1	13.0
29 Nov 90	22:20:00	30.2	4.5	90.4	13.0
29 Nov 90	22:21:00	30.6	4.4	91.1	13.1
29 Nov 90	22:22:00	30.9	4.5	90.3	13.0
29 Nov 90	22:23:00	26.9	4.4	90.0	13.1
29 Nov 90	22:24:00	28.3	4.5	90.2	12.9
29 Nov 90	22:25:00	25.9	4.7	89.5	12.9
29 Nov 90	22:26:00	24.7	4.7	90.0	12.9
29 Nov 90	22:27:00	24.5	4.7	89.2	12.9
29 Nov 90	22:28:00	25.7	4.7	89.4	12.8
29 Nov 90	22:29:00	26.9	4.7	90.0	12.8
29 Nov 90	22:30:00	26.4	4.8	89.2	12.7
29 Nov 90	22:31:00	25.3	4.9	90.4	12.7
29 Nov 90	22:32:00	23.3	4.9	89.8	12.7
29 Nov 90	22:33:00	23.8	4.9	89.7	12.7
29 Nov 90	22:34:00	26.7	4.9	90.0	12.6
29 Nov 90	22:35:00	23.2	5.0	89.4	12.6
29 Nov 90	22:36:00	22.8	5.0	89.5	12.6
29 Nov 90	22:37:00	26.6	5.1	90.1	12.5
29 Nov 90	22:38:00	27.9	5.1	89.3	12.5

29 Nov 90	22:39:00	25.6	5.2	88.5	12.4
29 Nov 90	22:40:00	23.8	5.2	88.0	12.4
29 Nov 90	22:41:00	26.6	5.1	89.8	12.5
29 Nov 90	22:42:00	25.0	4.9	89.6	12.7
29 Nov 90	22:43:00	25.6	4.8	89.4	12.7
29 Nov 90	22:44:00	24.7	4.7	89.3	12.8
29 Nov 90	22:45:00	25.4	4.7	89.4	12.8
29 Nov 90	22:46:00	23.4	4.7	89.7	12.8
29 Nov 90	22:47:00	29.1	4.7	89.9	12.9
29 Nov 90	22:48:00	28.6	4.6	90.2	12.9
29 Nov 90	22:49:00	26.8	4.6	91.4	12.9
29 Nov 90	22:50:00	25.2	4.7	90.3	12.9
29 Nov 90	22:51:00	25.9	4.7	89.5	12.8
29 Nov 90	22:52:00	26.0	4.9	89.8	12.6
29 Nov 90	22:53:00	25.3	4.9	89.9	12.6
29 Nov 90	22:54:00	26.6	4.9	89.2	12.6
29 Nov 90	22:55:00	23.6	5.0	89.2	12.6
29 Nov 90	22:56:00	25.0	5.0	89.4	12.5
29 Nov 90	22:57:00	25.7	5.0	88.9	12.6
29 Nov 90	22:58:00	24.5	5.1	89.3	12.5
29 Nov 90	22:59:00	25.3	5.1	88.5	12.5
29 Nov 90	23:00:00	26.9	5.1	88.3	12.5
29 Nov 90	23:01:00	25.5	5.1	88.6	12.5
29 Nov 90	23:02:00	29.4	5.2	87.5	12.4
29 Nov 90	23:03:00	25.9	5.2	87.1	12.4
29 Nov 90	23:04:00	25.2	5.3	87.5	12.4
29 Nov 90	23:05:00	27.5	5.3	87.2	12.3
29 Nov 90	23:06:00	24.7	5.4	87.2	12.3
29 Nov 90	23:07:00	26.0	5.2	88.6	12.4
29 Nov 90	23:08:00	27.4	5.1	89.2	12.5
29 Nov 90	23:09:00	27.4	5.1	88.6	12.5
29 Nov 90	23:10:00	26.1	5.0	89.2	12.6
29 Nov 90	23:11:00	27.5	5.0	88.9	12.6
29 Nov 90	23:12:00	23.1	5.0	89.1	12.6
29 Nov 90	23:13:00	26.2	4.9	89.5	12.7
29 Nov 90	23:14:00	26.4	4.8	89.8	12.7
29 Nov 90	23:15:00	27.6	4.9	89.4	12.7
29 Nov 90	23:16:00	25.6	4.9	90.1	12.6
29 Nov 90	23:17:00	25.2	5.0	89.4	12.6
29 Nov 90	23:18:00	25.2	5.0	89.2	12.5
29 Nov 90	23:19:00	26.9	5.1	89.5	12.5
29 Nov 90	23:20:00	23.1	5.0	89.3	12.5
29 Nov 90	23:21:00	22.9	5.1	89.3	12.5
29 Nov 90	23:22:00	23.6	5.2	88.2	12.4
29 Nov 90	23:23:00	24.5	5.2	87.9	12.4
29 Nov 90	23:24:00	24.3	5.3	88.4	12.3
29 Nov 90	23:25:00	77.6	6.8	75.7	10.9
29 Nov 90	23:26:00	236.4	8.2	67.7	10.1
29 Nov 90	23:27:00	249.1	8.3	66.8	10.0
29 Nov 90	23:28:00	361.8	6.9	80.2	11.5
29 Nov 90	23:29:00	54.6	5.4	88.8	12.3
29 Nov 90	23:30:00	25.9	5.4	88.6	12.3
29 Nov 90	23:30:00	27.1	5.5	88.4	12.1
29 Nov 90	23:32:00	25.4	5.5	89.0	12.2
29 Nov 90	23:33:00	23.3	5.4	89.6	12.3
29 Nov 90	23:34:00	24.8	5.1	90.3	12.5
29 Nov 90	23:35:00	23.0	5.0	91.3	12.6
29 Nov 90	23:36:00	22.3	5.0	90.2	12.6
29 Nov 90	23:37:00	23.6	5.1	91.5	12.5
29 Nov 90	23:38:00	22.9	5.0	91.3	12.6
29 Nov 90	23:39:00	20.4	4.9	92.1	12.7
29 Nov 90	23:40:00	24.5	4.8	92.6	12.7
29 Nov 90	23:41:00	19.1	4.9	92.0	12.6
29 Nov 90	23:42:00	21.7	4.9	92.1	12.7
29 Nov 90	23:43:00	22.7	4.9	91.1	12.7
29 Nov 90	23:44:00	23.8	4.9	91.0	12.7
29 Nov 90	23:45:00	23.1	5.0	90.6	12.6
29 Nov 90	23:46:00	23.4	5.0	90.1	12.6
29 Nov 90	23:47:00	22.7	5.1	90.0	12.6
29 Nov 90	23:48:00	23.1	5.2	90.0	12.5
29 Nov 90	23:49:00	25.2	5.2	90.0	12.4
29 Nov 90	23:50:00	27.6	5.3	90.6	12.4
29 Nov 90	23:51:00	25.9	5.3	89.7	12.3
29 Nov 90	23:52:00	26.6	5.3	89.5	12.4
29 Nov 90	23:53:00	22.2	5.4	89.2	12.3
29 Nov 90	23:54:00	25.0	5.3	89.2	12.3
29 Nov 90	23:55:00	26.8	5.4	89.7	12.2
29 Nov 90	23:56:00	26.4	5.3	89.9	12.6

AVERAGE	171.5	4.7	83.3	12.8
SPAN GAS VALUE	255.0	6.0	250.0	5.0
AVERAGE BIAS ZERO	1.0	0.0	0.0	0.0
AVERAGE BIAS SPAN	251.5	5.9	249.0	4.9
BIAS CORRECTED AVG	173.6	4.7	83.6	13.0

TITLE: TEST #9 (CON'T)
NOTE : SLURRY RUN 9 B

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
29 Nov 90	11:45:00	136.6	0.3	THC	285.1	16.8
29 Nov 90	11:46:00	590.3	0.7	ANALYZER	298.4	16.6
29 Nov 90	11:47:00	1000.0	0.5	NOT	284.6	16.6
29 Nov 90	11:48:00	1000.0	0.2	OPERATIONAL	273.8	16.6
29 Nov 90	11:49:00	1000.0	0.9		297.7	16.5
29 Nov 90	11:50:00	1000.0	1.6		315.8	15.9
29 Nov 90	11:51:00	973.9	1.9		313.1	15.9
29 Nov 90	11:52:00	1000.0	0.5		278.3	16.6
29 Nov 90	11:53:00	1000.0	0.5		274.6	16.5
29 Nov 90	11:54:00	1000.0	0.2		254.5	16.1
29 Nov 90	11:55:00	1000.0	0.2		256.7	16.1
29 Nov 90	11:56:00	1000.0	1.1		298.3	16.2
29 Nov 90	11:57:00	1000.0	1.6		305.0	16.0
29 Nov 90	11:58:00	973.9	1.9		309.3	15.8
29 Nov 90	11:59:00	951.0	1.5		299.8	16.1
29 Nov 90	12:00:00	475.9	1.4		302.9	15.8
29 Nov 90	12:01:00	657.1	2.5		326.8	15.1
29 Nov 90	12:02:00	753.1	2.5		324.8	15.2
29 Nov 90	12:03:00	964.1	2.3		321.9	15.3
29 Nov 90	12:04:00	885.3	2.7		324.7	15.1
29 Nov 90	12:05:00	725.6	2.8		330.5	15.0
29 Nov 90	12:06:00	777.3	2.7		327.2	15.1
29 Nov 90	12:07:00	891.9	2.6		324.3	15.1
29 Nov 90	12:08:00	641.6	3.0		332.5	14.7
29 Nov 90	12:09:00	380.4	3.3		342.6	14.5
29 Nov 90	12:10:00	347.5	3.4		341.2	14.4
29 Nov 90	12:11:00	256.7	3.5		341.5	14.3
29 Nov 90	12:12:00	199.4	3.7		346.2	14.2
29 Nov 90	12:13:00	159.4	3.9		348.0	14.0
29 Nov 90	12:14:00	170.2	4.1		350.6	13.9
29 Nov 90	12:15:00	87.7	4.2		348.5	13.8
29 Nov 90	12:16:00	55.2	4.4		359.1	13.6
29 Nov 90	12:17:00	426.9	3.1		319.2	15.2
29 Nov 90	12:18:00	1000.0	1.3		286.9	16.2
29 Nov 90	12:19:00	1000.0	1.5		299.4	16.0
29 Nov 90	12:20:00	973.6	2.1		313.3	15.5
29 Nov 90	12:21:00	973.9	2.2		313.3	15.5
29 Nov 90	12:22:00	973.9	2.3		312.4	15.3
29 Nov 90	12:23:00	973.9	2.6		314.7	15.1
29 Nov 90	12:24:00	974.0	2.5		313.8	15.3
29 Nov 90	12:25:00	974.0	2.2		314.8	15.2
29 Nov 90	12:26:00	452.3	3.8		345.5	14.0
29 Nov 90	12:27:00	156.7	3.8		338.2	14.1
29 Nov 90	12:28:00	203.4	3.8		343.6	14.1
29 Nov 90	12:29:00	183.7	3.7		343.4	14.3
29 Nov 90	12:30:00	193.0	3.7		340.0	14.2
29 Nov 90	12:31:00	183.9	3.8		347.4	14.0
29 Nov 90	12:32:00	110.5	4.5		359.1	13.5
29 Nov 90	12:33:00	72.0	4.7		359.0	13.4
29 Nov 90	12:34:00	34.3	4.9		364.5	13.2
29 Nov 90	12:35:00	28.1	5.0		368.7	13.1
29 Nov 90	12:36:00	28.1	5.2		370.1	13.0
29 Nov 90	12:37:00	28.6	5.2		376.0	12.9
29 Nov 90	12:38:00	19.9	5.4		371.6	12.7
29 Nov 90	12:39:00	23.2	5.3		372.2	13.1
29 Nov 90	12:40:00	243.1	3.6		334.3	14.2
29 Nov 90	12:41:00	262.9	3.7		338.9	14.1
29 Nov 90	12:42:00	184.8	3.9		337.2	14.0
29 Nov 90	12:43:00	144.9	4.0		344.0	13.9
29 Nov 90	12:44:00	110.5	4.1		344.0	13.8
29 Nov 90	12:45:00	127.6	4.1		346.6	13.9
29 Nov 90	12:46:00	74.0	4.5		352.4	13.5
29 Nov 90	12:47:00	63.0	4.7		348.5	13.4
29 Nov 90	12:48:00	55.7	4.7		352.0	13.4
29 Nov 90	12:49:00	49.2	4.8		361.9	13.2
29 Nov 90	12:50:00	40.4	4.8		353.0	13.4
29 Nov 90	12:51:00	137.5	4.0		340.6	14.1
29 Nov 90	12:52:00	205.2	3.5		332.7	14.3
29 Nov 90	12:53:00	392.1	3.3		329.9	14.4
29 Nov 90	12:54:00	479.0	3.0		323.4	14.7
29 Nov 90	12:55:00	616.2	2.9		328.3	14.7
29 Nov 90	12:56:00	688.1	2.9		325.3	14.8

29 Nov 90	12:57:00	724.3	2.9	323.8	14.8
29 Nov 90	12:58:00	771.6	2.6	319.9	15.0
29 Nov 90	12:59:00	877.5	2.7	320.0	15.0
29 Nov 90	13:00:00	732.3	2.8	322.9	14.8
29 Nov 90	13:01:00	634.3	3.0	332.6	14.5
29 Nov 90	13:02:00	561.6	3.2	327.6	14.8
29 Nov 90	13:03:00	707.5	3.7	340.9	13.9
29 Nov 90	13:04:00	115.2	4.5	351.5	13.5
29 Nov 90	13:05:00	52.6	4.7	362.5	13.4
29 Nov 90	13:06:00	37.9	4.9	356.2	13.2
29 Nov 90	13:07:00	268.1	3.5	330.3	14.5
29 Nov 90	13:08:00	576.3	3.1	327.3	14.6
29 Nov 90	13:09:00	471.4	3.1	324.5	14.7
29 Nov 90	13:10:00	505.6	3.1	322.2	14.6
29 Nov 90	13:11:00	484.4	3.3	324.2	14.5
29 Nov 90	13:12:00	366.5	3.6	329.8	14.2
29 Nov 90	13:13:00	326.8	3.6	330.2	14.3
29 Nov 90	13:14:00	250.3	3.7	334.6	14.1
29 Nov 90	13:15:00	220.3	3.8	331.6	14.1
29 Nov 90	13:16:00	263.5	3.4	329.1	14.4
29 Nov 90	13:17:00	563.9	2.7	324.6	15.0
29 Nov 90	13:18:00	405.6	4.0	350.9	13.7
29 Nov 90	13:19:00	66.9	4.5	351.8	13.5
29 Nov 90	13:20:00	68.4	4.7	353.6	13.4
29 Nov 90	13:21:00	59.9	4.6	356.5	13.5
29 Nov 90	13:22:00	55.2	4.6	356.7	13.4
29 Nov 90	13:23:00	39.6	4.6	354.9	13.5
29 Nov 90	13:24:00	55.0	4.6	353.1	13.5
29 Nov 90	13:25:00	60.9	4.7	353.7	13.4
29 Nov 90	13:26:00	38.1	4.9	364.1	13.2
29 Nov 90	13:27:00	61.0	4.4	350.4	14.0
29 Nov 90	13:28:00	847.1	2.3	314.1	15.3
29 Nov 90	13:29:00	973.8	2.4	314.4	15.2
29 Nov 90	13:30:00	954.7	2.8	317.9	14.9
29 Nov 90	13:31:00	933.0	2.5	310.9	15.1
29 Nov 90	13:32:00	857.2	2.9	319.2	14.8
29 Nov 90	13:33:00	687.7	2.9	319.5	14.7
29 Nov 90	13:34:00	545.8	3.2	324.6	14.5
29 Nov 90	13:35:00	357.9	3.4	328.8	14.3
29 Nov 90	13:36:00	328.7	3.7	334.6	14.1
29 Nov 90	13:37:00	214.0	3.9	341.5	14.0
29 Nov 90	13:38:00	162.5	4.1	339.1	13.9
29 Nov 90	13:39:00	125.2	4.3	341.8	13.7
29 Nov 90	13:40:00	83.3	4.4	343.2	13.6
29 Nov 90	13:41:00	98.7	4.4	340.2	13.6
29 Nov 90	13:42:00	110.9	4.2	335.6	13.9
29 Nov 90	13:43:00	354.6	3.3	328.2	14.4
29 Nov 90	13:44:00	592.4	3.2	326.5	14.6
29 Nov 90	13:45:00	642.4	2.9	325.6	14.6
29 Nov 90	13:46:00	518.5	2.4	298.6	15.5
29 Nov 90	13:47:00	973.5	1.1	289.1	16.1
29 Nov 90	13:48:00	803.2	1.9	306.9	15.6
29 Nov 90	13:49:00	974.0	1.9	305.9	15.7
29 Nov 90	13:50:00	974.0	2.0	307.8	15.5
29 Nov 90	13:51:00	974.0	2.4	314.7	15.1
29 Nov 90	13:52:00	784.1	2.8	322.6	14.9
29 Nov 90	13:53:00	702.7	3.0	322.4	14.6
29 Nov 90	13:54:00	495.1	3.2	329.8	14.5
29 Nov 90	13:55:00	329.2	3.6	337.5	14.2
29 Nov 90	13:56:00	202.2	3.9	341.9	14.0
29 Nov 90	13:57:00	100.2	4.3	346.7	13.7
29 Nov 90	13:58:00	85.5	4.5	353.0	13.5
29 Nov 90	13:59:00	62.2	4.6	352.2	13.4
29 Nov 90	14:00:00	595.2	2.8	316.5	15.1
29 Nov 90	14:01:00	590.5	3.7	332.9	14.0
29 Nov 90	14:02:00	129.8	4.3	345.0	13.6
29 Nov 90	14:03:00	207.6	3.8	329.1	14.4
29 Nov 90	14:04:00	973.8	2.4	309.4	15.2
29 Nov 90	14:05:00	974.0	2.4	312.9	15.2
29 Nov 90	14:06:00	974.0	2.5	310.8	15.1
29 Nov 90	14:07:00	974.0	2.5	311.1	15.1
29 Nov 90	14:08:00	974.0	2.3	305.0	15.5
29 Nov 90	14:09:00	947.1	2.6	321.6	14.9
29 Nov 90	14:10:00	575.8	3.1	325.5	14.6
29 Nov 90	14:11:00	480.9	3.1	328.6	14.5
29 Nov 90	14:12:00	441.4	3.2	330.4	14.5
29 Nov 90	14:13:00	525.6	3.0	328.0	14.7
29 Nov 90	14:14:00	571.4	3.2	329.4	14.5
29 Nov 90	14:15:00	438.2	3.5	336.7	14.2

29 Nov 90	14:16:00	249.0	4.0	342.2	13.9
29 Nov 90	14:17:00	144.1	4.1	347.6	13.8
29 Nov 90	14:18:00	84.3	4.4	355.0	13.6
29 Nov 90	14:19:00	371.8	3.4	321.6	14.8
29 Nov 90	14:20:00	969.7	2.8	323.7	14.5
29 Nov 90	14:21:00	291.5	4.1	339.4	14.1
29 Nov 90	14:22:00	946.5	2.1	304.2	15.5
29 Nov 90	14:23:00	974.0	2.2	308.2	15.4
29 Nov 90	14:24:00	974.0	2.6	313.1	15.0
29 Nov 90	14:25:00	739.0	3.1	325.8	14.4
29 Nov 90	14:26:00	218.2	4.3	347.0	13.6
29 Nov 90	14:27:00	71.6	4.6	349.5	13.4
29 Nov 90	14:28:00	90.8	4.2	334.3	14.1
29 Nov 90	14:29:00	601.7	0.6	203.5	13.7
CO-FIRE					
29 Nov 90	14:30:00	1.0	1.1	190.6	14.5
29 Nov 90	14:31:00	580.1	2.7	203.2	14.0
29 Nov 90	14:32:00	680.0	3.7	207.2	13.4
29 Nov 90	14:33:00	182.6	4.8	208.9	12.4
29 Nov 90	14:34:00	40.6	7.0	198.9	10.6
29 Nov 90	14:35:00	25.1	7.2	194.7	11.3
29 Nov 90	14:36:00	790.7	1.3	174.6	14.5
29 Nov 90	14:37:00	141.0	0.8	179.6	14.6
29 Nov 90	14:38:00	201.5	2.0	192.1	14.6
29 Nov 90	14:39:00	621.3	3.1	203.6	13.8
29 Nov 90	14:40:00	788.7	3.4	198.4	13.8
29 Nov 90	14:41:00	450.9	1.5	187.0	14.6
29 Nov 90	14:42:00	647.4	2.6	180.8	13.5
29 Nov 90	14:43:00	1000.0	0.5	162.8	14.0
29 Nov 90	14:44:00	1000.0	0.5	165.4	14.3
29 Nov 90	14:45:00	1000.0	1.4	183.4	14.5
29 Nov 90	14:46:00	687.3	3.8	202.0	13.0
29 Nov 90	14:47:00	456.7	2.9	187.4	14.3
29 Nov 90	14:48:00	422.4	1.8	193.8	14.5
29 Nov 90	14:49:00	630.9	2.1	186.6	14.5
29 Nov 90	14:50:00	641.5	1.9	192.9	14.2
29 Nov 90	14:51:00	822.2	4.4	192.0	13.2
29 Nov 90	14:52:00	974.0	2.6	203.3	14.0
29 Nov 90	14:53:00	487.4	6.2	207.8	11.0
29 Nov 90	14:54:00	20.6	7.3	201.7	10.5
29 Nov 90	14:55:00	179.0	5.2	202.8	12.9
29 Nov 90	14:56:00	815.0	4.6	209.3	12.2
29 Nov 90	14:57:00	41.0	6.4	205.4	11.2
29 Nov 90	14:58:00	20.3	7.7	191.3	10.2
29 Nov 90	14:59:00	17.5	7.6	192.4	10.2
29 Nov 90	15:00:00	17.7	8.1	189.3	9.9
29 Nov 90	15:01:00	18.3	8.0	195.4	10.2
29 Nov 90	15:02:00	22.6	6.2	209.4	11.4
29 Nov 90	15:03:00	25.2	5.9	212.1	12.1
29 Nov 90	15:04:00	53.9	5.0	215.2	12.5
29 Nov 90	15:05:00	43.6	5.6	209.7	12.1
29 Nov 90	15:06:00	561.0	2.7	198.7	13.9
29 Nov 90	15:07:00	315.8	6.3	206.4	11.1
29 Nov 90	15:08:00	23.0	7.0	194.9	10.5
29 Nov 90	15:09:00	29.3	6.9	195.3	10.8
29 Nov 90	15:10:00	33.0	9.4	138.6	8.6
29 Nov 90	15:11:00	52.9	9.8	129.4	8.4
29 Nov 90	15:12:00	128.3	8.7	142.8	10.3
29 Nov 90	15:13:00	603.8	2.0	188.8	14.5
29 Nov 90	15:14:00	1000.0	1.8	175.5	14.3
29 Nov 90	15:15:00	1000.0	1.1	178.0	14.9
29 Nov 90	15:16:00	475.9	2.4	191.4	14.2
29 Nov 90	15:17:00	666.1	3.1	143.8	12.9
29 Nov 90	15:18:00	219.9	6.8	109.6	10.4
	AVERAGE	467.0	3.5	296.6	14.1
	SPAN GAS VALUE	255.0	6.0	8.3	5.0
	AVERAGE BIAS ZERO	1.0	0.0	0.0	0.0
	AVERAGE BIAS SPAN	259.0	5.8	800.5	5.1
	BIAS CORRECTED AVG	460.6	3.6	3.1	13.8

TITLE: TEST #9 (CON'T)
NOTE : ACETONE TEST 9 B

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
30 Nov 90	18:00:00	366.5	8.9		107.2	8.8
30 Nov 90	18:01:00	233.4	10.0		86.5	8.1
30 Nov 90	18:02:00	187.8	10.5		79.1	7.9
30 Nov 90	18:03:00	216.4	8.9		98.0	9.4
30 Nov 90	18:04:00	1000.0	1.3		112.3	11.8
30 Nov 90	18:05:00	1000.0	1.1		118.5	12.4
30 Nov 90	18:06:00	1000.0	0.4		119.1	12.8
30 Nov 90	18:07:00	1000.0	0.3		117.2	12.9
30 Nov 90	18:08:00	1000.0	0.3		115.4	12.9
30 Nov 90	18:09:00	1000.0	0.2		113.7	13.0
30 Nov 90	18:10:00	1000.0	0.2		111.6	13.0
30 Nov 90	18:11:00	1000.0	0.2		109.6	13.1
30 Nov 90	18:12:00	1000.0	0.2		106.6	13.2
30 Nov 90	18:13:00	1000.0	0.2		103.8	13.1
30 Nov 90	18:14:00	1000.0	0.2		101.3	13.1
30 Nov 90	18:15:00	1000.0	0.2		99.0	13.2
30 Nov 90	18:16:00	1000.0	0.1		98.7	13.5
30 Nov 90	18:17:00	1000.0	0.1		92.9	13.6
30 Nov 90	18:18:00	1000.0	0.1		87.1	13.7
30 Nov 90	18:19:00	1000.0	0.1		81.3	13.9
30 Nov 90	18:20:00	1000.0	0.1		73.0	13.9
30 Nov 90	18:21:00	1000.0	0.1		62.9	14.0
30 Nov 90	18:22:00	1000.0	0.1		57.2	14.2
30 Nov 90	18:23:00	1000.0	0.1		57.7	14.8
30 Nov 90	18:24:00	1000.0	0.4		116.7	16.0
30 Nov 90	18:25:00	776.4	2.1		148.3	14.6
30 Nov 90	18:26:00	783.0	3.4		154.6	13.6
30 Nov 90	18:27:00	609.9	4.0		151.8	13.6
30 Nov 90	18:28:00	720.8	1.3		139.0	14.9
30 Nov 90	18:29:00	738.1	3.9		156.9	13.1
30 Nov 90	18:30:00	348.8	5.4		157.4	12.0
30 Nov 90	18:31:00	338.2	4.7		150.8	13.3
30 Nov 90	18:32:00	581.0	2.6		147.9	13.9
30 Nov 90	18:33:00	418.4	5.5		154.3	11.8
30 Nov 90	18:34:00	176.9	6.6		155.1	11.0
30 Nov 90	18:35:00	138.2	6.9		153.4	10.8
30 Nov 90	18:36:00	116.5	7.2		152.1	10.7
30 Nov 90	18:37:00	100.5	6.5		152.3	11.8
30 Nov 90	18:38:00	829.4	3.2		148.4	13.8
30 Nov 90	18:39:00	222.7	5.3		153.3	12.0
30 Nov 90	18:40:00	112.8	6.7		153.9	11.0
30 Nov 90	18:41:00	108.2	5.1		152.6	12.9
30 Nov 90	18:42:00	384.5	3.6		150.6	13.7
30 Nov 90	18:43:00	267.8	4.0		154.0	13.3
30 Nov 90	18:44:00	285.7	5.4		157.4	11.9
30 Nov 90	18:45:00	104.2	6.9		153.5	10.7
30 Nov 90	18:46:00	87.0	7.7		151.0	10.6
30 Nov 90	18:47:00	521.9	3.2		149.4	14.4
30 Nov 90	18:48:00	971.1	2.7		149.9	14.3
30 Nov 90	18:49:00	804.5	1.9		143.7	14.8
30 Nov 90	18:50:00	576.8	3.7		155.4	13.2
30 Nov 90	18:51:00	145.6	5.8		158.3	11.7
30 Nov 90	18:52:00	99.2	6.2		159.7	11.4
30 Nov 90	18:53:00	82.8	6.5		157.0	11.2
30 Nov 90	18:54:00	72.9	6.7		157.2	11.1
30 Nov 90	18:55:00	66.4	6.8		155.9	11.0
30 Nov 90	18:56:00	62.8	6.5		156.8	11.5
30 Nov 90	18:57:00	310.7	3.0		121.5	13.1
30 Nov 90	18:58:00	322.8	6.0		81.8	10.7
30 Nov 90	18:59:00	107.9	7.4		79.5	10.2
30 Nov 90	19:00:00	70.0	7.1		80.6	10.4
30 Nov 90	19:01:00	70.2	6.8		81.1	10.6
30 Nov 90	19:02:00	67.5	6.9		80.4	10.5
30 Nov 90	19:03:00	68.7	6.8		78.1	10.6
30 Nov 90	19:04:00	71.4	6.8		75.8	10.6
30 Nov 90	19:05:00	71.1	6.8		75.3	10.6
30 Nov 90	19:06:00	70.2	6.8		73.8	10.6
30 Nov 90	19:07:00	70.1	6.9		74.5	10.5
30 Nov 90	19:08:00	64.9	7.0		71.7	10.5
30 Nov 90	19:09:00	60.7	7.0		73.9	10.4
30 Nov 90	19:10:00	58.0	7.2		76.4	10.3
30 Nov 90	19:11:00	56.8	7.2		77.1	10.3

30 Nov 90	19:12:00	54.8	7.3	77.6	10.3
30 Nov 90	19:13:00	53.7	7.3	76.6	10.3
30 Nov 90	19:14:00	52.0	7.4	76.3	10.2
30 Nov 90	19:15:00	53.4	7.4	76.0	10.2
30 Nov 90	19:16:00	50.8	7.4	75.5	10.2
30 Nov 90	19:17:00	53.7	7.4	74.9	10.2
30 Nov 90	19:18:00	49.9	7.4	76.0	10.2
30 Nov 90	19:19:00	50.8	7.4	75.4	10.2
30 Nov 90	19:20:00	50.4	7.7	73.4	10.0
30 Nov 90	19:21:00	51.9	7.5	73.9	10.1
30 Nov 90	19:22:00	51.9	7.4	74.3	10.2
30 Nov 90	19:23:00	53.5	7.4	75.0	10.2
30 Nov 90	19:24:00	52.4	7.3	74.7	10.3
30 Nov 90	19:25:00	54.3	7.3	74.1	10.2
30 Nov 90	19:26:00	54.7	7.3	74.8	10.3
30 Nov 90	19:27:00	56.8	7.3	73.4	10.3
30 Nov 90	19:28:00	53.9	7.3	74.4	10.3
30 Nov 90	19:29:00	53.4	7.3	73.4	10.3
30 Nov 90	19:30:00	53.3	7.3	74.0	10.3
30 Nov 90	19:31:00	56.4	7.2	73.1	10.3
30 Nov 90	19:32:00	55.0	7.3	74.2	10.2
30 Nov 90	19:33:00	51.3	7.4	74.2	10.2
30 Nov 90	19:34:00	51.4	7.5	74.6	10.1
30 Nov 90	19:35:00	51.0	7.5	74.5	10.1
30 Nov 90	19:36:00	50.6	7.5	74.5	10.1
30 Nov 90	19:37:00	54.8	8.4	72.5	9.3
30 Nov 90	19:38:00	54.8	8.6	72.9	9.3
30 Nov 90	19:39:00	49.4	8.4	73.7	9.5
30 Nov 90	19:40:00	48.4	8.3	74.1	9.5
30 Nov 90	19:41:00	49.0	8.3	74.2	9.6
30 Nov 90	19:42:00	48.8	8.2	73.7	9.6
30 Nov 90	19:43:00	47.8	8.2	73.7	9.6
30 Nov 90	19:44:00	49.0	8.2	74.2	9.6
30 Nov 90	19:45:00	50.2	8.2	73.7	9.6
30 Nov 90	19:46:00	46.3	8.2	73.7	9.6
30 Nov 90	19:47:00	46.0	8.2	73.4	9.6
30 Nov 90	19:48:00	45.9	8.2	73.4	9.6
30 Nov 90	19:49:00	47.4	8.2	73.7	9.6
30 Nov 90	19:50:00	46.7	8.2	73.4	9.6
30 Nov 90	19:51:00	46.6	8.2	73.5	9.6
30 Nov 90	19:52:00	48.4	8.3	73.1	9.6
30 Nov 90	19:53:00	46.0	8.3	73.2	9.5
30 Nov 90	19:54:00	46.3	8.3	73.0	9.5
30 Nov 90	19:55:00	46.7	8.2	73.5	9.6
30 Nov 90	19:56:00	44.9	8.3	73.3	9.5
30 Nov 90	19:57:00	45.7	8.3	72.3	9.5
30 Nov 90	19:58:00	42.1	8.5	72.0	9.4
30 Nov 90	19:59:00	46.9	8.5	72.8	9.5
30 Nov 90	20:00:00	77.1	7.0	72.8	10.6
30 Nov 90	20:01:00	102.9	7.1	72.5	10.4
30 Nov 90	20:02:00	93.5	7.3	75.8	10.5
30 Nov 90	20:03:00	464.5	1.8	71.2	9.1
30 Nov 90	20:04:00	1000.0	0.7	85.3	14.0
30 Nov 90	20:05:00	1000.0	0.6	77.1	14.0
30 Nov 90	20:06:00	1000.0	0.7	76.4	13.9
30 Nov 90	20:07:00	1000.0	0.8	80.6	14.1
30 Nov 90	20:08:00	1000.0	0.8	80.5	14.1
30 Nov 90	20:09:00	1000.0	0.7	81.3	14.1
30 Nov 90	20:10:00	1000.0	0.4	76.4	13.8
30 Nov 90	20:11:00	1000.0	1.0	82.6	14.3
30 Nov 90	20:12:00	1000.0	0.5	79.1	14.0
30 Nov 90	20:13:00	1000.0	1.0	80.7	14.1
30 Nov 90	20:14:00	1000.0	0.7	78.3	14.1
30 Nov 90	20:15:00	1000.0	1.0	77.4	13.9
30 Nov 90	20:16:00	1000.0	0.8	80.2	14.3
30 Nov 90	20:17:00	1000.0	1.1	75.5	13.5
30 Nov 90	20:18:00	1000.0	0.6	70.4	13.2
30 Nov 90	20:19:00	1000.0	0.5	73.9	13.8
30 Nov 90	20:20:00	1000.0	0.7	77.8	14.2
30 Nov 90	20:21:00	1000.0	0.7	78.0	14.2
30 Nov 90	20:22:00	1000.0	0.7	77.2	14.2
30 Nov 90	20:23:00	1000.0	0.7	77.8	14.3
30 Nov 90	20:24:00	1000.0	0.7	78.3	14.2
30 Nov 90	20:25:00	1000.0	0.8	76.8	14.1
30 Nov 90	20:26:00	1000.0	0.7	76.4	14.0
30 Nov 90	20:27:00	1000.0	0.7	77.7	14.1
30 Nov 90	20:28:00	1000.0	0.7	76.6	14.1
30 Nov 90	20:29:00	1000.0	0.7	77.3	14.1
30 Nov 90	20:30:00	1000.0	0.7	77.7	14.1

30 Nov 90	20:31:00	1000.0	0.4	73.0	13.8
30 Nov 90	20:32:00	1000.0	1.0	79.6	14.2
30 Nov 90	20:33:00	1000.0	0.7	67.0	11.8
30 Nov 90	20:34:00	1000.0	16.1	23.9	4.2
30 Nov 90	20:35:00	1000.0	0.6	90.3	14.9
30 Nov 90	20:36:00	1000.0	0.3	71.8	10.4
30 Nov 90	20:37:00	1000.0	0.3	125.9	11.7
30 Nov 90	20:38:00	1000.0	0.1	85.3	14.3
30 Nov 90	20:39:00	1000.0	-0.1	79.5	14.2
30 Nov 90	20:40:00	1000.0	-0.1	81.8	13.8
30 Nov 90	20:41:00	1000.0	0.1	89.8	14.7
30 Nov 90	20:42:00	1000.0	0.2	88.2	14.7
30 Nov 90	20:43:00	1000.0	0.2	88.4	14.8
30 Nov 90	20:44:00	1000.0	0.3	89.3	14.7
30 Nov 90	20:45:00	1000.0	0.2	88.4	14.6
30 Nov 90	20:46:00	1000.0	0.3	87.1	14.5
30 Nov 90	20:47:00	1000.0	0.4	82.3	14.3
30 Nov 90	20:48:00	1000.0	0.3	82.5	14.2
30 Nov 90	20:49:00	1000.0	0.5	84.1	14.3
30 Nov 90	20:50:00	1000.0	0.6	83.8	14.3
30 Nov 90	20:51:00	1000.0	0.6	83.6	14.2
30 Nov 90	20:52:00	1000.0	0.5	77.7	14.1
30 Nov 90	20:53:00	1000.0	0.6	84.3	14.3
30 Nov 90	20:54:00	1000.0	0.7	81.3	14.1
30 Nov 90	20:55:00	1000.0	0.8	88.5	14.5
30 Nov 90	20:56:00	1000.0	0.5	77.1	13.8
30 Nov 90	20:57:00	1000.0	1.0	90.3	14.5
30 Nov 90	20:58:00	385.7	0.4	76.7	13.8
30 Nov 90	20:59:00	174.1	12.7	25.4	2.9
30 Nov 90	21:00:00	86.4	19.4	3.2	0.0
30 Nov 90	21:01:00	33.7	10.6	66.3	9.6
30 Nov 90	21:02:00	78.7	6.4	85.6	10.8
30 Nov 90	21:03:00	88.5	7.6	86.0	10.2
30 Nov 90	21:04:00	360.8	2.6	85.6	10.2
30 Nov 90	21:05:00	1.3	0.1	117.3	10.6
30 Nov 90	21:06:00	32.9	2.6	102.5	12.9
30 Nov 90	21:07:00	308.7	6.7	84.5	10.5
30 Nov 90	21:08:00	178.2	6.8	83.2	10.8
30 Nov 90	21:09:00	190.6	6.3	84.9	11.5
30 Nov 90	21:10:00	190.7	6.6	85.1	10.8
30 Nov 90	21:11:00	171.6	6.7	84.3	10.8
30 Nov 90	21:12:00	162.3	6.7	83.1	10.8
30 Nov 90	21:13:00	150.0	6.7	82.9	10.8
30 Nov 90	21:14:00	151.5	5.3	80.4	11.8
30 Nov 90	21:15:00	154.2	7.9	82.6	10.0
30 Nov 90	21:16:00	108.4	6.0	84.8	11.0
30 Nov 90	21:17:00	127.2	7.7	83.0	10.4
30 Nov 90	21:18:00	104.2	6.6	84.3	10.5
30 Nov 90	21:19:00	105.1	7.3	84.3	10.8
30 Nov 90	21:20:00	96.9	7.2	83.5	10.1
30 Nov 90	21:21:00	95.1	6.9	83.9	11.1
30 Nov 90	21:22:00	90.3	6.1	84.5	11.3
30 Nov 90	21:23:00	96.3	6.1	84.8	11.3
30 Nov 90	21:24:00	98.8	7.0	84.4	10.3
30 Nov 90	21:25:00	94.7	7.8	85.0	10.0
30 Nov 90	21:26:00	84.8	7.9	83.2	10.0
30 Nov 90	21:27:00	81.5	7.8	84.0	10.0
30 Nov 90	21:28:00	78.5	7.7	83.7	10.1
30 Nov 90	21:29:00	73.5	7.5	87.1	10.5
30 Nov 90	21:30:00	362.5	1.2	72.5	9.9
30 Nov 90	21:31:00	1.4	0.1	109.6	12.9
30 Nov 90	21:32:00	52.9	0.1	86.7	14.7
30 Nov 90	21:33:00	222.4	0.0	84.4	14.7
30 Nov 90	21:34:00	136.5	0.2	88.5	14.5
30 Nov 90	21:35:00	295.4	0.0	84.1	14.3
30 Nov 90	21:36:00	212.8	0.5	91.3	14.7
30 Nov 90	21:37:00	593.2	4.5	84.7	11.4
30 Nov 90	21:38:00	136.1	6.8	83.8	11.0
30 Nov 90	21:39:00	112.4	7.2	80.9	10.3
30 Nov 90	21:40:00	100.5	6.0	79.5	11.3
30 Nov 90	21:41:00	95.6	6.2	83.0	11.1
30 Nov 90	21:42:00	99.5	8.0	79.9	9.7
30 Nov 90	21:43:00	79.6	6.4	81.3	11.0
30 Nov 90	21:44:00	79.3	7.7	79.1	9.8
30 Nov 90	21:45:00	80.0	6.9	82.6	10.6
30 Nov 90	21:46:00	84.5	8.1	79.8	9.9
30 Nov 90	21:47:00	65.8	6.5	83.0	10.9
30 Nov 90	21:48:00	78.6	8.0	78.3	9.7
30 Nov 90	21:49:00	78.2	6.8	82.0	10.9

30 Nov 90	21:50:00	67.5	7.3	80.8	10.0
30 Nov 90	21:51:00	90.0	7.4	82.5	10.6
30 Nov 90	21:52:00	62.9	6.6	83.1	10.9
30 Nov 90	21:53:00	67.4	6.6	83.0	10.8
30 Nov 90	21:54:00	66.9	6.6	82.9	10.9
30 Nov 90	21:55:00	69.6	7.2	81.9	10.2
30 Nov 90	21:56:00	77.1	7.9	81.9	9.9
30 Nov 90	21:57:00	74.4	8.2	80.7	9.6
30 Nov 90	21:58:00	70.7	8.1	81.4	9.7
30 Nov 90	21:59:00	68.2	8.0	81.6	9.9
30 Nov 90	22:00:00	66.7	7.9	82.1	9.9
30 Nov 90	22:01:00	67.9	7.9	81.8	9.9
30 Nov 90	22:02:00	65.0	7.8	81.9	9.9
30 Nov 90	22:03:00	69.0	8.2	81.6	9.7
30 Nov 90	22:04:00	298.8	2.3	77.9	11.2
30 Nov 90	22:05:00	1000.0	-0.0	84.2	10.7
30 Nov 90	22:06:00	1000.0	4.0	108.8	11.9
30 Nov 90	22:07:00	129.4	7.4	85.1	10.1
30 Nov 90	22:08:00	72.8	7.9	82.1	9.9
30 Nov 90	22:09:00	67.3	7.7	86.2	10.0
30 Nov 90	22:10:00	65.9	7.7	85.8	10.0
30 Nov 90	22:11:00	65.0	7.6	84.4	10.1
30 Nov 90	22:12:00	60.2	7.6	83.9	10.1
30 Nov 90	22:13:00	56.5	7.5	81.1	10.1
30 Nov 90	22:14:00	52.3	7.8	76.4	10.0
30 Nov 90	22:15:00	45.6	7.7	77.0	10.0
30 Nov 90	22:16:00	49.4	7.8	80.5	9.9
30 Nov 90	22:17:00	65.3	8.1	80.3	9.7
30 Nov 90	22:18:00	60.8	8.0	81.8	9.8
30 Nov 90	22:19:00	63.4	7.9	81.0	9.9
30 Nov 90	22:20:00	62.1	7.9	81.8	9.9
30 Nov 90	22:21:00	58.3	7.5	80.5	10.3
30 Nov 90	22:22:00	73.0	7.4	79.1	10.2
30 Nov 90	22:23:00	70.1	6.9	78.8	10.7
30 Nov 90	22:24:00	68.6	7.2	79.8	10.4
30 Nov 90	22:25:00	63.8	7.1	78.3	10.1
30 Nov 90	22:26:00	77.7	7.4	79.8	10.5
30 Nov 90	22:27:00	75.6	7.7	78.1	10.0
30 Nov 90	22:28:00	65.3	7.3	77.3	10.0
30 Nov 90	22:29:00	71.9	7.2	79.6	10.7
30 Nov 90	22:30:00	320.9	4.4	78.0	11.1
30 Nov 90	22:31:00	1000.0	0.2	61.5	9.4
30 Nov 90	22:32:00	1000.0	0.8	107.2	12.2
30 Nov 90	22:33:00	201.7	7.1	88.4	10.2
30 Nov 90	22:34:00	112.5	6.9	84.8	10.5
30 Nov 90	22:35:00	88.6	6.9	86.4	10.7
30 Nov 90	22:36:00	86.3	7.7	83.9	9.7
30 Nov 90	22:37:00	84.9	7.2	85.4	10.7
30 Nov 90	22:38:00	71.0	7.4	81.8	9.9
30 Nov 90	22:39:00	77.3	7.5	81.9	10.6
30 Nov 90	22:40:00	67.7	6.8	78.4	10.7
30 Nov 90	22:41:00	69.5	7.7	73.5	9.7
30 Nov 90	22:42:00	56.9	7.5	76.2	10.5
30 Nov 90	22:43:00	57.2	6.9	78.1	10.6
30 Nov 90	22:44:00	64.5	7.0	76.6	10.6
30 Nov 90	22:45:00	67.2	6.9	77.1	10.6
30 Nov 90	22:46:00	65.2	7.3	77.9	10.2
30 Nov 90	22:47:00	64.5	8.2	78.4	9.7
30 Nov 90	22:48:00	55.8	8.1	78.6	9.8
30 Nov 90	22:49:00	56.0	8.0	77.7	9.8
30 Nov 90	22:50:00	55.8	8.0	78.4	9.9
30 Nov 90	22:51:00	54.6	8.0	77.7	9.8
30 Nov 90	22:52:00	58.3	7.9	77.7	9.9
30 Nov 90	22:53:00	52.5	7.1	76.6	10.6
30 Nov 90	22:54:00	58.9	6.7	74.6	10.8
30 Nov 90	22:55:00	64.5	6.7	74.7	10.8
30 Nov 90	22:56:00	67.9	6.6	73.5	10.8
30 Nov 90	22:57:00	69.7	6.6	74.7	10.8
30 Nov 90	22:58:00	71.3	6.6	74.7	10.8
30 Nov 90	22:59:00	69.6	7.6	75.8	9.9
30 Nov 90	23:00:00	62.5	7.9	77.2	9.9
30 Nov 90	23:01:00	51.7	7.9	77.4	9.9
30 Nov 90	23:02:00	50.6	8.2	77.2	9.6
30 Nov 90	23:03:00	221.2	2.7	74.4	10.8
30 Nov 90	23:04:00	1000.0	0.8	98.5	12.6
30 Nov 90	23:05:00	243.5	5.8	93.3	10.8
30 Nov 90	23:06:00	76.2	7.9	81.7	9.7
30 Nov 90	23:07:00	64.5	8.1	84.8	9.8
30 Nov 90	23:08:00	67.2	8.1	84.3	9.7

30 Nov 90	23:09:00	64.5	8.0	84.1	9.8
30 Nov 90	23:10:00	60.2	7.4	83.8	10.1
30 Nov 90	23:11:00	67.4	7.3	81.2	10.4
30 Nov 90	23:12:00	66.8	7.3	82.2	10.5
30 Nov 90	23:13:00	59.6	6.4	84.3	10.8
30 Nov 90	23:14:00	62.4	7.6	79.0	10.2
30 Nov 90	23:15:00	62.3	7.6	77.6	10.0
30 Nov 90	23:16:00	56.9	7.6	77.4	10.0
30 Nov 90	23:17:00	52.6	7.0	78.9	10.3
30 Nov 90	23:18:00	51.8	7.2	78.7	10.8
30 Nov 90	23:19:00	57.7	6.9	76.1	10.3
30 Nov 90	23:20:00	53.2	7.5	77.1	10.6
30 Nov 90	23:21:00	64.7	7.9	76.8	9.7
30 Nov 90	23:22:00	61.3	7.5	75.7	10.0
30 Nov 90	23:23:00	56.8	7.2	75.7	10.8
30 Nov 90	23:24:00	70.6	8.0	74.8	9.8
30 Nov 90	23:25:00	60.6	6.5	74.9	10.7
30 Nov 90	23:26:00	60.6	7.8	75.3	10.3
30 Nov 90	23:27:00	72.2	6.2	74.2	11.1
30 Nov 90	23:28:00	74.1	6.7	74.9	10.6
30 Nov 90	23:29:00	57.7	8.1	75.6	9.7
30 Nov 90	23:30:00	44.1	8.2	77.6	9.7
30 Nov 90	23:31:00	38.8	8.1	77.8	9.8
30 Nov 90	23:32:00	40.6	7.8	77.0	10.1
30 Nov 90	23:33:00	50.6	6.6	75.2	10.9
30 Nov 90	23:34:00	58.3	6.6	77.5	10.8
30 Nov 90	23:35:00	53.7	6.7	77.5	10.8
30 Nov 90	23:36:00	56.5	7.1	77.4	10.3
30 Nov 90	23:37:00	129.8	6.8	88.1	10.9
30 Nov 90	23:38:00	236.9	0.2	62.0	10.4
30 Nov 90	23:39:00	1000.0	3.0	101.4	11.7
30 Nov 90	23:40:00	332.8	7.7	86.7	9.8
30 Nov 90	23:41:00	65.9	8.2	82.1	9.7
30 Nov 90	23:42:00	60.5	8.0	85.5	9.8
30 Nov 90	23:43:00	60.2	7.9	84.8	9.9
30 Nov 90	23:44:00	63.5	7.9	83.9	9.9
30 Nov 90	23:45:00	70.6	7.8	83.4	9.9
30 Nov 90	23:46:00	61.6	7.8	82.1	9.9
30 Nov 90	23:47:00	52.3	7.9	79.8	9.9
30 Nov 90	23:48:00	50.0	7.9	78.1	9.9
30 Nov 90	23:49:00	47.3	7.6	77.1	10.2
30 Nov 90	23:50:00	48.2	7.3	75.2	10.1
30 Nov 90	23:51:00	59.3	7.6	76.0	10.2
30 Nov 90	23:52:00	57.6	7.2	75.9	10.3
30 Nov 90	23:53:00	53.5	6.9	74.7	10.6
30 Nov 90	23:54:00	60.7	6.7	74.3	10.8
30 Nov 90	23:55:00	71.2	7.9	73.7	9.8
30 Nov 90	23:56:00	61.3	6.7	74.9	10.6
30 Nov 90	23:57:00	66.7	8.0	74.4	9.9
30 Nov 90	23:58:00	48.4	7.0	77.0	10.4
30 Nov 90	23:59:00	64.2	8.1	74.9	9.8
1 Dec 90	00:00:00	45.7	7.1	75.2	10.5
1 Dec 90	00:01:00	62.0	8.1	73.8	9.6
1 Dec 90	00:02:00	48.2	7.1	75.4	10.4
1 Dec 90	00:03:00	216.0	4.9	76.9	10.9
1 Dec 90	00:04:00	1000.0	0.4	69.7	10.7
1 Dec 90	00:05:00	170.2	5.0	93.5	11.3
1 Dec 90	00:06:00	128.0	7.3	83.6	10.2
1 Dec 90	00:07:00	65.7	7.2	84.0	10.4
1 Dec 90	00:08:00	61.1	7.0	85.4	10.5
1 Dec 90	00:09:00	56.7	7.2	82.5	10.1
1 Dec 90	00:10:00	78.7	8.5	79.7	9.7
1 Dec 90	00:11:00	53.3	6.9	80.5	10.6
1 Dec 90	00:12:00	57.6	6.9	81.7	10.6
1 Dec 90	00:13:00	52.1	7.4	80.1	9.9
1 Dec 90	00:14:00	82.7	8.4	78.5	9.8
1 Dec 90	00:15:00	52.1	7.7	77.2	9.7
1 Dec 90	00:16:00	73.2	8.2	77.2	10.0
1 Dec 90	00:17:00	50.1	6.9	77.0	10.6
1 Dec 90	00:18:00	55.1	6.9	76.0	10.6
1 Dec 90	00:19:00	68.3	8.8	74.9	9.1
1 Dec 90	00:20:00	55.4	7.0	76.1	10.7
1 Dec 90	00:21:00	57.5	6.8	75.6	10.7
1 Dec 90	00:22:00	67.4	8.1	73.9	9.3
1 Dec 90	00:23:00	64.6	7.5	77.1	10.5
1 Dec 90	00:24:00	47.1	7.0	75.9	10.5
1 Dec 90	00:25:00	51.8	7.1	75.8	10.5
1 Dec 90	00:26:00	48.8	7.1	76.1	10.4
1 Dec 90	00:27:00	47.5	7.1	76.4	10.5

1 Dec 90	00:28:00	47.8	7.1	75.9	10.4
1 Dec 90	00:29:00	47.3	7.1	75.9	10.4
1 Dec 90	00:30:00	49.0	7.1	79.1	10.8
1 Dec 90	00:31:00	413.4	1.0	59.9	9.9
1 Dec 90	00:32:00	1000.0	1.7	87.9	11.0
1 Dec 90	00:33:00	304.8	7.1	87.8	10.3
1 Dec 90	00:34:00	85.5	7.4	82.7	10.2
1 Dec 90	00:35:00	68.0	7.8	83.5	9.8
1 Dec 90	00:36:00	68.3	8.1	84.1	9.7
1 Dec 90	00:37:00	64.1	8.1	82.8	9.7
1 Dec 90	00:38:00	56.9	8.0	82.0	9.8
1 Dec 90	00:39:00	52.1	8.0	82.1	9.8
1 Dec 90	00:40:00	52.4	8.1	80.7	9.7
1 Dec 90	00:41:00	50.1	8.2	76.9	9.7
1 Dec 90	00:42:00	41.2	8.2	74.7	9.5
1 Dec 90	00:43:00	39.2	8.2	74.4	9.6
1 Dec 90	00:44:00	39.7	8.2	73.9	9.6
1 Dec 90	00:45:00	43.7	8.0	72.4	9.8
1 Dec 90	00:46:00	46.0	7.9	71.6	9.8
1 Dec 90	00:47:00	42.8	7.8	71.6	9.9
1 Dec 90	00:48:00	36.6	7.8	70.2	9.9
1 Dec 90	00:49:00	35.6	7.9	68.9	9.9
1 Dec 90	00:50:00	44.3	7.7	68.5	10.1
1 Dec 90	00:51:00	61.0	7.4	73.5	10.2
1 Dec 90	00:52:00	60.2	7.6	75.6	10.1
1 Dec 90	00:53:00	64.2	6.6	74.8	10.7
1 Dec 90	00:54:00	65.8	7.8	74.4	9.9
1 Dec 90	00:55:00	65.0	7.8	74.2	9.8
1 Dec 90	00:56:00	61.0	7.7	74.3	9.9
1 Dec 90	00:57:00	60.0	7.1	73.8	10.1
1 Dec 90	00:58:00	64.4	7.4	75.0	10.5
1 Dec 90	00:59:00	61.7	6.7	74.4	10.6
1 Dec 90	01:00:00	66.4	8.2	74.7	9.6
1 Dec 90	01:01:00	121.0	5.8	79.6	11.2
1 Dec 90	01:02:00	1000.0	0.4	67.8	9.4
1 Dec 90	01:03:00	1000.0	3.8	95.8	11.9
1 Dec 90	01:04:00	211.9	7.8	81.1	9.6
1 Dec 90	01:05:00	96.4	7.1	81.6	10.7
1 Dec 90	01:06:00	85.0	7.8	81.5	9.6
1 Dec 90	01:07:00	74.6	6.8	82.8	10.9
1 Dec 90	01:08:00	76.4	6.2	78.6	11.0
1 Dec 90	01:09:00	77.6	6.4	81.7	10.9
1 Dec 90	01:10:00	68.8	7.0	81.5	10.3
1 Dec 90	01:11:00	67.7	8.4	80.1	9.4
1 Dec 90	01:12:00	57.5	8.2	81.7	9.6
1 Dec 90	01:13:00	50.9	8.1	80.8	9.7
1 Dec 90	01:14:00	49.8	8.0	79.1	9.8
1 Dec 90	01:15:00	50.1	8.0	77.9	9.7
1 Dec 90	01:16:00	55.7	8.2	76.7	9.6
1 Dec 90	01:17:00	48.4	8.4	77.7	9.5
1 Dec 90	01:18:00	43.6	8.2	76.8	9.6
1 Dec 90	01:19:00	43.1	8.1	77.0	9.7
1 Dec 90	01:20:00	46.8	8.1	75.9	9.6
1 Dec 90	01:21:00	48.0	7.6	74.0	10.1
1 Dec 90	01:22:00	51.9	7.7	73.1	10.0
1 Dec 90	01:23:00	56.6	7.4	72.8	10.3
1 Dec 90	01:23:00	51.4	6.9	74.8	10.6
1 Dec 90	01:25:00	70.4	8.1	75.9	9.6
1 Dec 90	01:26:00	54.1	7.7	76.4	9.7
1 Dec 90	01:27:00	66.3	7.5	78.4	10.4
1 Dec 90	01:28:00	67.9	8.1	75.6	9.7
1 Dec 90	01:29:00	56.8	8.0	75.4	9.7
1 Dec 90	01:30:00	65.5	7.2	78.1	10.5
1 Dec 90	01:31:00	49.3	6.9	78.2	10.6
1 Dec 90	01:32:00	76.6	8.6	76.6	9.5
1 Dec 90	01:33:00	404.7	1.4	62.0	9.6
1 Dec 90	01:34:00	1000.0	3.1	86.5	11.0
1 Dec 90	01:35:00	272.5	7.8	84.4	9.6
1 Dec 90	01:36:00	109.2	7.8	81.0	10.3
1 Dec 90	01:37:00	81.2	7.7	81.7	9.7
1 Dec 90	01:38:00	78.7	8.8	82.5	9.4
1 Dec 90	01:39:00	67.5	6.6	82.9	10.9
1 Dec 90	01:40:00	71.6	8.2	79.8	9.5
1 Dec 90	01:41:00	65.2	6.7	80.3	10.8
1 Dec 90	01:42:00	67.8	6.6	79.2	10.8
1 Dec 90	01:43:00	72.2	6.6	76.0	10.8
1 Dec 90	01:44:00	73.6	7.2	75.7	10.2
1 Dec 90	01:45:00	61.2	8.6	77.4	9.4
1 Dec 90	01:46:00	46.0	8.5	76.6	9.5

1 Dec 90	01:47:00	41.6	8.4	78.0	9.6
1 Dec 90	01:48:00	42.6	8.2	77.1	9.7
1 Dec 90	01:49:00	44.5	8.1	76.3	9.7
1 Dec 90	01:50:00	48.9	8.2	75.5	9.8
1 Dec 90	01:51:00	46.2	7.1	73.6	10.5
1 Dec 90	01:52:00	56.2	8.3	72.4	9.4
1 Dec 90	01:53:00	57.1	7.2	73.5	10.5
1 Dec 90	01:54:00	51.4	7.4	72.0	9.9
1 Dec 90	01:55:00	71.9	8.0	73.9	10.1
1 Dec 90	01:56:00	49.7	7.0	72.6	10.3
1 Dec 90	01:57:00	78.4	8.4	73.1	9.7
1 Dec 90	01:58:00	49.5	7.0	72.5	10.6
1 Dec 90	01:59:00	51.9	7.0	73.8	10.5
1 Dec 90	02:00:00	60.7	7.3	75.1	10.0
1 Dec 90	02:01:00	77.3	8.9	75.7	9.5
1 Dec 90	02:02:00	405.9	3.5	74.1	10.4
1 Dec 90	02:03:00	1000.0	1.0	71.7	10.0
1 Dec 90	02:04:00	159.6	6.7	89.2	10.5
1 Dec 90	02:05:00	145.3	7.9	82.1	9.5
1 Dec 90	02:06:00	120.1	8.6	82.2	9.3
1 Dec 90	02:07:00	79.3	8.0	84.3	10.1
1 Dec 90	02:08:00	64.7	6.6	83.5	10.8
1 Dec 90	02:09:00	73.5	6.9	81.5	10.2
1 Dec 90	02:10:00	81.6	8.7	81.2	9.6
1 Dec 90	02:11:00	63.7	6.6	80.5	10.8
1 Dec 90	02:12:00	64.2	6.8	80.3	10.6
1 Dec 90	02:13:00	73.6	8.9	76.7	8.9
1 Dec 90	02:14:00	54.6	7.1	77.7	10.6
1 Dec 90	02:15:00	59.5	7.0	76.2	10.5
1 Dec 90	02:16:00	58.7	7.0	75.4	10.6
1 Dec 90	02:17:00	61.5	6.9	75.4	10.5
1 Dec 90	02:18:00	60.2	7.0	75.5	10.6
1 Dec 90	02:19:00	63.2	7.0	74.8	10.5
1 Dec 90	02:20:00	59.9	7.0	74.7	10.5
1 Dec 90	02:21:00	58.1	7.6	74.3	9.9
1 Dec 90	02:22:00	56.1	8.4	75.6	9.5
1 Dec 90	02:23:00	50.9	8.3	76.0	9.6
1 Dec 90	02:24:00	57.1	8.3	75.1	9.5
1 Dec 90	02:25:00	62.8	8.4	76.3	9.5
1 Dec 90	02:26:00	65.9	8.5	75.2	9.4
1 Dec 90	02:27:00	68.2	8.5	74.9	9.5
1 Dec 90	02:28:00	66.3	8.4	75.2	9.5
1 Dec 90	02:29:00	62.7	8.3	75.1	9.5
1 Dec 90	02:30:00	63.3	8.3	74.7	9.6
1 Dec 90	02:31:00	64.0	8.2	75.2	9.6
1 Dec 90	02:32:00	63.3	8.1	75.1	9.7
1 Dec 90	02:33:00	150.3	6.7	79.9	10.6
1 Dec 90	02:34:00	267.8	0.6	55.3	8.7
1 Dec 90	02:35:00	1000.0	1.4	79.9	10.7
1 Dec 90	02:36:00	206.6	6.5	89.2	10.6
1 Dec 90	02:37:00	146.4	7.7	83.4	10.1
1 Dec 90	02:38:00	100.5	7.7	83.9	9.9
1 Dec 90	02:39:00	86.3	6.9	87.7	10.6
1 Dec 90	02:40:00	78.7	7.9	83.2	9.8
1 Dec 90	02:41:00	66.9	7.3	81.8	9.9
1 Dec 90	02:42:00	69.3	7.4	82.3	10.5
1 Dec 90	02:43:00	64.6	6.8	78.8	10.6
1 Dec 90	02:44:00	65.4	6.9	77.2	10.6
1 Dec 90	02:45:00	68.3	8.6	75.4	9.2
1 Dec 90	02:46:00	53.1	6.9	75.3	10.5
1 Dec 90	02:47:00	55.5	7.1	74.1	10.1
1 Dec 90	02:48:00	59.2	8.7	76.0	9.5
1 Dec 90	02:49:00	47.3	7.6	73.3	9.7
1 Dec 90	02:50:00	54.5	7.9	74.4	10.1
1 Dec 90	02:51:00	55.4	6.8	73.4	10.7
1 Dec 90	02:52:00	61.8	8.7	73.7	9.2
1 Dec 90	02:53:00	57.1	6.8	72.3	10.7
1 Dec 90	02:54:00	57.0	7.5	72.3	9.7
1 Dec 90	02:55:00	57.3	8.2	73.5	9.9
1 Dec 90	02:56:00	50.3	6.9	71.9	10.6
1 Dec 90	02:57:00	59.0	6.8	72.3	10.6
1 Dec 90	02:58:00	60.7	6.8	71.2	10.7
1 Dec 90	02:59:00	64.3	6.8	70.7	10.5
1 Dec 90	03:00:00	59.1	8.4	72.1	9.3
1 Dec 90	03:01:00	46.1	8.5	74.3	9.4
1 Dec 90	03:02:00	530.8	3.4	71.9	10.0
1 Dec 90	03:03:00	1000.0	1.0	74.2	10.3
1 Dec 90	03:04:00	306.9	6.9	89.8	10.2
1 Dec 90	03:05:00	126.4	8.0	82.2	9.7

1 Dec 90	03:06:00	83.2	8.1	83.4	9.7
1 Dec 90	03:07:00	70.4	8.2	85.4	9.7
1 Dec 90	03:08:00	67.1	8.1	84.8	9.7
1 Dec 90	03:09:00	68.1	8.1	84.5	9.7
1 Dec 90	03:10:00	62.3	8.2	82.7	9.6
1 Dec 90	03:11:00	66.2	8.3	80.7	9.5
1 Dec 90	03:12:00	71.4	8.4	79.0	9.5
1 Dec 90	03:13:00	66.5	8.3	80.0	9.6
1 Dec 90	03:14:00	62.0	8.2	79.7	9.6
1 Dec 90	03:15:00	56.4	8.1	79.6	9.6
1 Dec 90	03:16:00	63.7	7.8	79.9	9.9
1 Dec 90	03:17:00	66.0	7.8	79.7	9.9
1 Dec 90	03:18:00	61.6	7.4	81.2	10.4
1 Dec 90	03:19:00	55.5	7.7	80.5	9.9
1 Dec 90	03:20:00	61.9	7.2	80.9	10.4
1 Dec 90	03:21:00	74.7	8.1	77.0	9.7
1 Dec 90	03:22:00	57.2	7.6	78.3	9.7
1 Dec 90	03:23:00	78.6	7.7	79.7	10.3
1 Dec 90	03:24:00	79.0	8.1	76.3	9.6
1 Dec 90	03:25:00	58.0	7.2	79.3	10.4
1 Dec 90	03:26:00	50.0	7.2	79.5	10.4
1 Dec 90	03:27:00	79.1	8.6	75.1	9.2
1 Dec 90	03:28:00	76.7	7.2	78.4	10.4
1 Dec 90	03:29:00	56.0	7.8	76.1	9.6
1 Dec 90	03:30:00	105.8	8.0	76.9	10.1
1 Dec 90	03:31:00	79.6	8.6	75.3	9.3
1 Dec 90	03:32:00	408.0	2.7	69.1	10.0
1 Dec 90	03:33:00	1000.0	2.3	75.4	10.7
1 Dec 90	03:34:00	84.3	7.3	84.8	10.2
1 Dec 90	03:35:00	93.0	7.6	82.2	10.1
1 Dec 90	03:36:00	76.2	8.1	80.7	9.4
1 Dec 90	03:37:00	70.7	7.5	86.5	10.4
1 Dec 90	03:38:00	51.3	7.1	86.0	10.4
1 Dec 90	03:39:00	50.8	7.2	83.3	10.3
1 Dec 90	03:40:00	64.7	8.6	78.2	9.4
1 Dec 90	03:41:00	48.3	7.3	78.2	10.3
1 Dec 90	03:42:00	49.3	7.3	77.3	10.3
1 Dec 90	03:43:00	50.4	7.2	75.9	10.4
1 Dec 90	03:44:00	48.2	7.3	77.8	10.3
1 Dec 90	03:45:00	47.9	7.3	77.7	10.3
1 Dec 90	03:46:00	59.8	8.2	75.8	9.4
1 Dec 90	03:47:00	60.7	8.4	77.1	9.5
1 Dec 90	03:48:00	50.9	8.4	76.7	9.5
1 Dec 90	03:49:00	54.3	8.4	76.2	9.5
1 Dec 90	03:50:00	53.1	8.4	76.0	9.5
1 Dec 90	03:51:00	53.7	8.4	75.6	9.5
	AVERAGE	239.1	6.2	83.4	10.8
	SPAN GAS VALUE	255.0	6.0	803.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	0.0	0.0
	AVERAGE BIAS SPAN	259.0	5.8	800.5	5.1
	BIAS CORRECTED AVG	235.3	6.4	83.6	10.5

TITLE: TEST #9 (CON'T)
NOTE : SLURRY AND OIL RUN 9 C

DATE	TIME	CHANNEL #17 ID: CO UNIT: PPM	CHANNEL #19 ID: O2 UNIT: PCT	CHANNEL #20 ID: THC UNIT: PPM	CHANNEL #21 ID: NOX UNIT: PPM	CHANNEL #23 ID: CO2 UNIT: PCT
30 Nov 90	10:30:00	0.7	0.5		113.3	12.7
30 Nov 90	10:31:00	0.9	0.6		114.3	12.7
30 Nov 90	10:32:00	0.4	0.6		115.0	13.0
30 Nov 90	10:33:00	0.7	0.6		115.4	12.8
30 Nov 90	10:34:00	0.9	0.7		117.1	12.8
30 Nov 90	10:35:00	0.7	0.8		127.5	13.4
30 Nov 90	10:36:00	0.9	0.9		143.9	14.4
30 Nov 90	10:37:00	84.9	2.1		165.4	14.3
30 Nov 90	10:38:00	541.3	2.4		151.9	14.4
30 Nov 90	10:39:00	848.7	2.1		149.1	14.5
30 Nov 90	10:40:00	838.4	1.4		129.4	13.4
30 Nov 90	10:41:00	0.8	0.8		124.7	13.1
30 Nov 90	10:42:00	1.0	2.0		144.4	13.2
30 Nov 90	10:43:00	427.6	3.9		144.1	12.7
30 Nov 90	10:44:00	-4.6	0.9		130.3	14.0
30 Nov 90	10:45:00	415.4	1.2		132.3	14.0
30 Nov 90	10:46:00	51.7	1.0		125.5	13.6
30 Nov 90	10:47:00	0.6	1.0		124.6	13.6
30 Nov 90	10:48:00	0.7	1.2		131.8	14.2
30 Nov 90	10:49:00	168.3	2.7		148.7	13.9
30 Nov 90	10:50:00	654.2	4.3		150.7	13.1
30 Nov 90	10:50:00	523.3	2.0		138.9	14.3
30 Nov 90	10:52:00	731.9	3.4		150.8	13.7
30 Nov 90	10:53:00	970.0	3.8		151.3	13.3
30 Nov 90	10:54:00	741.1	4.1		150.2	13.1
30 Nov 90	10:55:00	336.5	5.7		162.5	11.5
30 Nov 90	10:56:00	64.4	7.6		177.9	10.6
30 Nov 90	10:57:00	41.0	7.7		181.6	10.4
30 Nov 90	10:58:00	34.9	7.7		180.6	10.4
30 Nov 90	10:59:00	75.4	7.8		150.1	10.7
30 Nov 90	11:00:00	588.2	3.6		154.7	13.6
30 Nov 90	11:01:00	522.9	2.5		154.1	14.4
30 Nov 90	11:02:00	593.9	2.9		158.2	14.2
30 Nov 90	11:03:00	974.1	3.3		162.2	13.9
30 Nov 90	11:04:00	831.5	3.8		166.7	13.6
30 Nov 90	11:05:00	821.3	4.3		174.3	12.9
30 Nov 90	11:06:00	201.1	5.1		171.7	12.7
30 Nov 90	11:07:00	304.1	5.2		177.0	12.1
30 Nov 90	11:08:00	38.2	6.9		178.4	11.0
30 Nov 90	11:09:00	55.6	5.9		171.3	12.0
30 Nov 90	11:10:00	99.9	5.1		174.2	12.4
30 Nov 90	11:11:00	365.9	5.6		160.8	12.4
30 Nov 90	11:12:00	641.4	1.6		145.4	14.7
30 Nov 90	11:13:00	692.8	1.9		147.7	14.6
30 Nov 90	11:14:00	491.6	2.5		153.6	14.3
30 Nov 90	11:15:00	843.1	3.6		163.0	13.6
30 Nov 90	11:16:00	447.0	4.5		168.0	12.8
30 Nov 90	11:17:00	90.8	6.3		174.0	11.3
30 Nov 90	11:18:00	35.1	7.8		162.2	10.0
30 Nov 90	11:19:00	40.8	6.3		167.0	11.4
30 Nov 90	11:20:00	79.0	10.1		109.7	8.1
30 Nov 90	11:21:00	169.3	6.5		114.3	11.5
30 Nov 90	11:22:00	238.1	4.6		112.4	12.4
30 Nov 90	11:23:00	436.5	7.2		94.6	10.0
30 Nov 90	11:24:00	484.6	8.0		92.2	9.5
30 Nov 90	11:25:00	380.5	9.3		70.1	8.7
30 Nov 90	11:26:00	22.8	9.4		68.6	8.7
30 Nov 90	11:27:00	22.7	8.9		82.1	9.1
30 Nov 90	11:28:00	246.8	6.3		127.7	9.9
30 Nov 90	11:29:00	0.6	2.1		115.3	11.9
30 Nov 90	11:30:00	272.9	9.0		74.1	8.8
30 Nov 90	11:31:00	84.3	9.3		72.0	8.8
30 Nov 90	11:32:00	112.2	8.4		86.7	10.0
30 Nov 90	11:33:00	523.4	1.2		127.0	11.5
30 Nov 90	11:34:00	0.8	1.1		129.8	11.3
30 Nov 90	11:35:00	1.0	1.1		109.7	12.6
30 Nov 90	11:36:00	0.6	1.3		119.1	13.6
30 Nov 90	11:37:00	0.2	4.8		107.5	10.8
30 Nov 90	11:38:00	445.6	8.9		84.3	9.0
30 Nov 90	11:39:00	136.2	9.0		83.4	9.1
30 Nov 90	11:40:00	445.2	7.7		101.5	10.0
30 Nov 90	11:41:00	87.3	8.3		94.5	9.5

30 Nov 90	11:42:00	68.6	8.4	95.4	9.5
30 Nov 90	11:43:00	61.6	8.4	90.9	9.4
30 Nov 90	11:44:00	57.8	8.5	89.0	9.4
30 Nov 90	11:45:00	52.7	8.5	85.9	9.4
30 Nov 90	11:46:00	46.7	8.5	88.1	9.3
30 Nov 90	11:47:00	44.3	8.5	84.0	9.4
30 Nov 90	11:48:00	42.3	8.5	84.8	9.4
30 Nov 90	11:49:00	39.7	8.6	81.4	9.3
30 Nov 90	11:50:00	39.7	8.8	80.2	9.1
30 Nov 90	11:51:00	36.3	8.8	80.8	9.2
30 Nov 90	11:52:00	35.3	8.8	79.4	9.1
30 Nov 90	11:53:00	34.5	8.8	78.8	9.1
30 Nov 90	11:54:00	32.7	8.8	78.8	9.1
30 Nov 90	11:55:00	32.6	8.8	78.6	9.2
30 Nov 90	11:56:00	30.7	8.8	79.0	9.2
30 Nov 90	11:57:00	31.1	8.8	78.2	9.2
30 Nov 90	11:58:00	31.9	8.8	77.9	9.1
30 Nov 90	11:59:00	32.0	8.8	78.1	9.2
30 Nov 90	12:00:00	30.6	8.8	78.0	9.1
30 Nov 90	12:01:00	31.0	8.8	78.0	9.2
30 Nov 90	12:02:00	29.4	8.7	78.1	9.2
30 Nov 90	12:03:00	29.2	8.7	78.1	9.2
30 Nov 90	12:04:00	30.1	8.7	77.6	9.3
30 Nov 90	12:05:00	31.5	8.7	77.9	9.2
30 Nov 90	12:06:00	28.1	8.8	78.2	9.2
30 Nov 90	12:07:00	28.4	8.8	78.2	9.2
30 Nov 90	12:08:00	29.7	8.7	77.9	9.2
30 Nov 90	12:09:00	28.8	8.7	77.9	9.2
30 Nov 90	12:10:00	29.2	8.7	78.0	9.2
30 Nov 90	12:11:00	29.7	8.7	77.3	9.2
30 Nov 90	12:12:00	29.0	8.7	77.5	9.2
30 Nov 90	12:13:00	28.8	8.8	77.7	9.2
30 Nov 90	12:14:00	29.1	8.9	79.4	9.3
30 Nov 90	12:15:00	335.4	2.6	101.7	13.0
30 Nov 90	12:16:00	1000.0	1.3	103.2	12.8
30 Nov 90	12:17:00	1000.0	1.3	92.6	13.1
30 Nov 90	12:18:00	1000.0	1.2	83.9	11.8
30 Nov 90	12:19:00	1000.0	1.2	91.9	11.5
30 Nov 90	12:20:00	1000.0	1.2	95.4	11.5
30 Nov 90	12:21:00	1000.0	1.1	96.3	11.6
30 Nov 90	12:22:00	1000.0	0.9	100.1	11.8
30 Nov 90	12:23:00	1000.0	0.4	100.1	12.6
30 Nov 90	12:24:00	1000.0	0.3	101.7	12.6
30 Nov 90	12:25:00	1000.0	0.2	122.0	14.2
30 Nov 90	12:26:00	1000.0	0.2	125.9	14.5
30 Nov 90	12:27:00	1000.0	0.3	121.4	13.7
30 Nov 90	12:28:00	1000.0	0.3	118.7	12.7
30 Nov 90	12:29:00	1000.0	0.3	119.3	12.8
30 Nov 90	12:30:00	1000.0	0.2	120.1	12.8
30 Nov 90	12:31:00	1000.0	0.2	122.3	12.6
30 Nov 90	12:32:00	1000.0	0.2	124.7	12.7
30 Nov 90	12:33:00	1000.0	0.1	132.9	13.4
30 Nov 90	12:34:00	1000.0	0.1	147.4	14.5
30 Nov 90	12:35:00	1000.0	0.1	150.5	14.8
30 Nov 90	12:36:00	1000.0	0.1	149.5	14.7
30 Nov 90	12:37:00	1000.0	0.3	180.3	15.8
30 Nov 90	12:38:00	1000.0	2.6	248.8	14.9
30 Nov 90	12:39:00	547.7	4.2	264.5	13.6
30 Nov 90	12:40:00	320.2	4.5	266.5	13.6
30 Nov 90	12:41:00	236.7	4.6	268.0	13.3
30 Nov 90	12:42:00	180.4	6.0	269.9	12.2
30 Nov 90	12:43:00	137.0	6.2	264.0	12.1
30 Nov 90	12:44:00	110.6	6.3	265.8	12.1
30 Nov 90	12:45:00	96.1	6.4	260.4	12.0
30 Nov 90	12:46:00	85.5	6.4	261.6	12.0
30 Nov 90	12:47:00	80.0	6.2	260.0	12.2
30 Nov 90	12:48:00	77.5	6.2	256.1	12.2
30 Nov 90	12:49:00	74.8	6.2	259.2	12.1
30 Nov 90	12:50:00	70.4	6.5	261.5	12.0
30 Nov 90	12:51:00	66.0	6.4	261.9	12.0
30 Nov 90	12:52:00	63.6	6.5	257.6	11.9
FLAMEOUT					
30 Nov 90	16:31:00	203.7	7.1	76.5	10.2
30 Nov 90	16:32:00	123.1	7.8	78.2	10.0
30 Nov 90	16:33:00	96.0	7.8	78.9	10.0
30 Nov 90	16:34:00	83.5	7.8	79.1	10.0
30 Nov 90	16:35:00	84.6	7.8	79.3	10.0
30 Nov 90	16:36:00	79.5	7.8	79.5	10.1
30 Nov 90	16:37:00	71.2	7.8	79.8	10.1

30 Nov 90	16:38:00	63.2	7.8	80.2	10.0
30 Nov 90	16:39:00	57.0	7.8	79.5	10.0
30 Nov 90	16:40:00	69.2	7.8	80.0	10.0
30 Nov 90	16:41:00	62.1	7.8	80.2	10.0
30 Nov 90	16:42:00	74.1	7.7	80.6	10.0
30 Nov 90	16:43:00	94.2	8.0	77.1	9.7
30 Nov 90	16:44:00	250.2	2.5	80.6	11.4
30 Nov 90	16:45:00	0.9	-0.1	71.3	10.0
30 Nov 90	16:46:00	1.2	0.0	83.1	9.7
30 Nov 90	16:47:00	1.6	0.2	100.1	10.6
30 Nov 90	16:48:00	64.2	1.5	132.0	14.3
30 Nov 90	16:49:00	277.4	0.9	118.3	14.1
30 Nov 90	16:50:00	243.3	3.1	131.7	13.8
30 Nov 90	16:51:00	787.5	4.1	131.3	13.0
30 Nov 90	16:52:00	219.2	4.8	131.8	12.6
30 Nov 90	16:53:00	149.6	5.0	130.6	12.5
30 Nov 90	16:54:00	143.6	5.0	129.5	12.5
30 Nov 90	16:55:00	144.7	5.0	130.2	12.4
30 Nov 90	16:56:00	110.6	5.2	129.7	12.2
30 Nov 90	16:57:00	82.5	6.1	126.8	11.4
30 Nov 90	16:58:00	62.3	6.4	126.2	11.2
30 Nov 90	16:59:00	59.9	6.3	127.5	11.4
30 Nov 90	17:00:00	57.6	6.2	130.3	11.4
30 Nov 90	17:01:00	56.6	6.2	130.0	11.4
30 Nov 90	17:02:00	56.1	6.1	129.8	11.5
30 Nov 90	17:03:00	58.3	6.2	128.5	11.4
30 Nov 90	17:04:00	57.1	6.2	128.9	11.5
30 Nov 90	17:05:00	56.1	5.9	131.0	11.7
30 Nov 90	17:06:00	460.9	3.5	123.4	13.7
30 Nov 90	17:07:00	178.1	1.7	125.6	14.4
30 Nov 90	17:08:00	546.0	2.5	133.1	14.2
30 Nov 90	17:09:00	66.3	2.7	132.7	14.1
30 Nov 90	17:10:00	802.9	3.2	136.1	13.8
30 Nov 90	17:11:00	960.2	3.7	135.6	13.3
30 Nov 90	17:12:00	403.3	4.6	135.7	12.8
30 Nov 90	17:13:00	186.8	4.7	134.7	12.7
30 Nov 90	17:14:00	177.4	4.9	134.9	12.4
30 Nov 90	17:15:00	94.9	5.5	132.8	11.9
30 Nov 90	17:16:00	62.0	6.3	129.4	11.3
30 Nov 90	17:17:00	602.5	2.3	117.0	14.3
30 Nov 90	17:18:00	68.0	2.1	126.6	14.2
30 Nov 90	17:19:00	584.9	2.5	129.1	14.1
30 Nov 90	17:20:00	450.3	3.1	130.8	13.9
30 Nov 90	17:21:00	740.2	1.4	111.8	14.4
30 Nov 90	17:22:00	1000.0	1.8	125.9	14.1
30 Nov 90	17:23:00	574.3	4.7	144.3	12.5
30 Nov 90	17:24:00	89.2	5.5	144.7	12.0
30 Nov 90	17:25:00	63.1	5.7	147.3	11.9
	AVERAGE	299.6	4.9	127.8	11.8
	SPAN GAS VALUE	255.0	6.0	803.0	5.0
	AVERAGE BIAS ZERO	1.0	0.0	0.0	0.0
	AVERAGE BIAS SPAN	259.0	5.8	800.5	5.1
	BIAS CORRECTED AVG	295.1	5.0	128.2	11.5