# 1992 ANNUAL REPORT

## SUMMARIZING THE RESULTS OF LANDFILL GAS MONITORING PROGRAMS AT THE OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX AND ADJACENT AREAS

SUBMITTED TO:

TOWN OF OYSTER BAY
DEPARTMENT OF PUBLIC WORKS

MAY 1993

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# SUMMARIZING THE RESULTS OF LANDFILL GAS

# MONITORING PROGRAMS

AT THE

OLD BETHPAGE
SOLID WASTE DISPOSAL COMPLEX
AND ADJACENT AREAS

Submitted to:

TOWN OF OYSTER BAY

DEPARTMENT OF PUBLIC WORKS

SYOSSET, NEW YORK

Prepared by:

LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS
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SYOSSET, NEW YORK

MAY 1993

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# BACKGROUND

## 1.1 General

The Old Bethpage Solid Waste Disposal Complex (OBSWDC) is located between Winding and Claremont Roads, south of Bethpage-Sweet Hollow Road in the Town of Oyster Bay, Nassau County, New York. The OBSWDC consists of a total of 134 acres which contain a closed and capped landfill, inactive incinerators, an inactive baler, a municipal solid waste (MSW) Transfer Facility, a Groundwater Treatment Facility, a Leachate Treatment Facility, Landfill Gas Control and Recovery Systems, a periodically operated New York State Department of Environmental Conservation (NYSDEC) approved Clean Fill Disposal Site, a Recycling Facility, scalehouse, recharge basins, stockpile areas and vehicle maintenance facilities.

## 1.2 Presence of Combustible Gas

On March 7, 1979, pursuant to inspections performed by the Nassau County Fire Commission, a violation was issued to the Nassau County Fireman's Training Center (NCFTC) and an order was given to remove all sources of ignition at the NCFTC because an explosive atmosphere was reported to exist in certain enclosed areas on-site (the NCFTC borders the OBSWDC on the southeast). In order to prevent landfill gas (LFG) from contributing to the creation of an explosive atmosphere at the NCFTC, the Town installed a landfill gas control and recovery system. Subsequent to this event, the Town has and continues to conduct regular combustible gas monitoring at the NCFTC, along the perimeter of the OBSWDC, in on-site buildings and at various off-site locations.

## 1.3 Authority

The presence of migrating gases in the vicinity of the OBSWDC was factored into the "SPECIAL CONDITIONS" category attached to the Permit to Operate No. 0013, Application 30-S-15, dated August 14, 1979. This permit was issued by the New York State Department of Environmental Conservation (NYSDEC) to the Town as per the requirements of 6 NYCRR Part 360. Special Conditions 2 and 4 of the permit required that the Town submit the following three (3) reports, respectively:

- Old Bethpage Landfill, Fireman's Training Center, % Combustible Gas, Sampling Data Summary, LKB, August 31, 1979;
- Old Bethpage Landfill, Fireman's Training Center, % Combustible Gas, Sampling Data Summary, LKB, January 29, 1981; and
- Old Bethpage Landfill Land Use Plan, LKB, December 1, 1979.

Both the August 31, 1979 and January 29, 1981 reports and The Land Use Plan included capital improvement programs for the collection and treatment of landfill gas (LFG) and ongoing LFG sampling programs. The Land Use Plan and monitoring programs received Town approval as per Town Board Resolution No. 136-80 (TBR 136-80) on February 9, 1980 and NYSDEC approval on January 31, 1981. Renewal of the 6 NYCRR Part 360 permit to operate was applied for by the Town on July 6, 1982. This renewal permit was issued by the NYSDEC to the Town on June 1, 1984 as per the requirements of 6 NYCRR Part 360.

As part of the renewal permit conditions, the Town was required to develop a monthly monitoring program acceptable to the NYSDEC and the Nassau County Department of Health (NCDH). The monitoring program was conducted along all boundaries of the OBSWDC and in all on-site facility structures. Monitoring results were required to be submitted in the form of a report to the NYSDEC and the NCDH. In April 1986, the landfill ceased operations and all MSW subsequently has been hauled off-site for disposal or recycling.

Additionally, the Town was required to submit an annual engineering report prepared by a licensed professional engineering firm for the purpose of summarizing the status of all landfill gas monitoring programs, including the zero percent gas migration limitations. Authorization for work summarized in this report was granted on December 17, 1991 and July 21, 1992 by passage of TBR No. 1130-91 and 548-92, respectively, and is outlined as follows:

- annual site monitoring program exploring the radial migration of landfill gas;
- evaluation of the monthly monitoring data which are obtained by Town personnel;
- submission of an engineering report evaluating the results from both the site monitoring and monthly monitoring programs;
- transmission of all the evaluated combustible gas monitoring data to the Town, which are then sent to the regulatory authorities;
- coordination of all the Town landfill gas monitoring programs outlined in Section 6 of the Comprehensive Land Use and Operations Plan,(LKB, October 1983).

On June 30, 1988, the Town of Oyster Bay and the New York State Department of Law (NYSDOL) entered into a Final Consent Decree for the remediation of the Old Bethpage Landfill (83 CIV. 5357). Incorporated into the Consent Decree was a Remedial Action Plan (RAP) which detailed the actions to be undertaken by the Town in compliance with the Final Consent Decree.

Appendix A, Section I(H) of the RAP obligates the Town to continue to operate and maintain the existing gas control systems in compliance with the requirements of 6 NYCRR Part 360 and maintain a zero percent gas migration limitation at the OBSWDC property boundary. The RAP further states that in order to demonstrate such compliance, the Town will have to conduct the monitoring program described in the Lockwood, Kessler & Bartlett Report entitled <u>1986 Annual Report Summarizing the Status of Landfill Gas Monitoring Programs and the Establishment of the Zero Percent Gas Migration Limitation at the Old Bethpage Landfill</u> (LKB, April 1987).

In addition, the same section of the RAP requires the Town to supplement this monitoring program with data obtained from the following:

- quarterly ambient volatile organic compound (VOC) air sampling to be taken at three (3) selected locations during the first year of remediation and if approved by the New York State Department of Law (NYSDOL), annually thereafter;

- quarterly subsurface VOC gas sampling to be collected at fourteen (14) selected sampling locations at a depth of 30" during the first year of remediation and if approved by the NYSDOL, on an annual basis thereafter;

- quarterly subsurface VOC gas sampling at location M-9 (Figure 1) at depths of 10', 20', 30' and 40' during the initial year of remediation, and if approved by the NYSDOL, on an annual basis thereafter;

- quarterly thermal oxidizer emission sampling for VOC levels during the initial year of remediation. These results will be related to the thermal oxidizer temperatures during the initial year of sampling. Thereafter, the oxidizer temperatures will be monitored on a monthly basis to insure that temperatures needed to volatilize the organics are being maintained in the oxidizer. The oxidizer emissions will continue to be sampled on an annual basis for VOC content;

- quarterly pressure readings at three (3) locations during the initial year of remediation and if approved by the NYSDOL, on an annual basis thereafter.

In 1990-91, four quarterly rounds of ambient air and subsurface gas sampling were performed. An interpretive report prepared by LKB entitled Evaluation of Ambient Volatile Organic Compounds in Air and Soils concluded that, based on the test results generated that the landfill does not have a significant adverse impact on the ambient air.

This report was submitted to NYSDEC in early 1992 with a recommendation to reduce the testing frequency from quarterly to annually on the basis of these findings. The NYSDEC denied the Town's recommendation and directed the Town to continue quarterly testing. The only quarterly test (second year of monitoring, first quarterly test) was conducted on October 26-27, 1992. The results of this test confirm the findings of previous testing.

Pressure sampling indicated that all pressure probes were under zero or negative pressure at the time of the test. This supports data obtained as part of the annual zero migration line which shows that as a result of the effectiveness of the Town's landfill gas control system that no off-site landfill gas migration is occurring at the OBSWDC. This report has not been released for agency review, since certain issues related to applicable limitations values are currently under discussion with NYSDEC. Upon resolution of these discussions, this report will be finalized and submitted to the regulatory agencies.

The Consent Decree provided for an automatic reduction in the quarterly testing frequency of the thermal oxidizer stack emissions after the initial year on monitoring to annually. This annual testing of the stack emissions took place on November 10,

1992. The results of the testing indicated that the thermal oxidizer emissions were well below the acceptable ambient guideline concentrations (AGC's) as stipulated by the NYSDEC.

As per the conditions of the Final Consent Decree and the Remedial Action Plan (RAP Attachment 2-Old Bethpage Landfill Supplemental Gas Monitoring Program), appended herewith are the Ambient Air Quality and Soil Gas Quality Survey's - Second Year of Monitoring, First Quarter Report (Appendix C) and the Annual Emissions Test Report - Landfill Gas Thermal Oxidizer (Appendix D) required as part of the Supplemental Gas Monitoring Program.

1.4 Background of Gas Detection and Control Programs

The Town of Oyster Bay has initiated several detection and control programs to monitor and prevent the off-site migration of landfill gas in the vicinity of the OBSWDC. Initially, the Town installed permanent sampling probes around the perimeter of the OBSWDC to detect potential off-site landfill gas migration. Next, field data were collected to help locate areas possibly troubled by off-site landfill gas migration.

Upon analysis of the data collected during the field measurements and based on the calculations presented in the Engineering Report entitled Preliminary Engineering Design Report; Phase 1 Gas Control and Recovery Program (LKB, June 1980), the Town prepared final Contract Documents for public bid (April 1981) to obviate the potential for off-site migration of landfill gas onto NCFTC property. The Phase 1 Gas Control and Recovery System became operational in June 1982. These actions were immediately undertaken by the Town thereby alleviating off-site landfill gas migration onto the NCFTC.

As part of the conclusions and recommendations presented in the Preliminary Engineering Design Report (LKB, June 1980) and based on additional monitoring data obtained by the Consultants, which revealed that gas migration was occurring across Winding

Road, the Town prepared final Contract Documents for public bid (May 1983) and constructed the Phase 2 Gas Control System.

The Phase 2 System was constructed by the Town to control the off-site migration of landfill gas along Winding Road. To monitor the effectiveness of the Phase 2 System, the Town installed new permanent sampling probes adjacent to and across the road from the system along Winding Road. The Phase 2 System and the permanent sampling probe construction was completed in April 1984.

The Town also installed an additional vent well, approximately 300 feet south of LGV-5, to further guard against possible migration of landfill gas onto the NCFTC from the Phase I Landfill (western portion of NCFTC). As discussed in detail in Section 3, the utilization of the Phase 2 System has effectively alleviated the off-site migration of landfill gas along Winding Road.

Based on the results of past site monitoring data obtained by the Consultants over a five year period (between 1982 and 1986), which revealed that gas migration was possibly occurring in the vicinity of the northwestern corner and western portions of the OBSWDC, the Town prepared final Contract Documents (October 1985) and constructed the Phase 3 Gas Control System. Construction of the Phase 3 Gas Control System was completed in early March 1987 and the system was placed in full operation in April 1987.

The Phase 3 system, which is similar in design to the Phase 1 and 2 Systems, was designed to obviate the migration of landfill gas in the northwestern and western portions of the OBSWDC. As discussed in detail in Section 3, the Phase 3 Gas Control System has effectively obviated the migration of landfill gas from this portion of the OBSWDC.

In addition to the previously mentioned detection and control programs, the Town has implemented several other detection and control programs to monitor and prevent the off-site migration of landfill gases.

Following is a brief description of these programs as well as additional landfill gas/condensate related projects:

- As part of the Remedial Action Plan, which requires the Town to cap all existing uncapped portions of the landfill, a portion of the existing Phase 3 Gas Control System header had to be removed and a buried header installed. In January 1993, capping operations at the landfill were completed. The Town deactivated the buried header and re-installed the above-ground header system which continues to obviate the migration of landfill gas in this portion of the site.

- In December 1985, the Town granted and leased all rights to landfill gas which is produced within the existing portions of the OBSWDC to Energy Tactics, Inc. (ET). As part of this lease, ET designed a system to convert high quality landfill gas into energy for sale to the Long Island Lighting Company (LILCO). Upon the sale of energy to LILCO, the Town receives a royalty payment from ET. This lease remains in force for twenty-five years and based on operations to date will continue to be beneficial to both the Town and ET.

  It should be noted that during the course of landfill capping, ET has had to remove/relocate portions of their system to accommodate these operations. ET submitted an application to operate a Solid Waste Management Facility to the NYSDEC in September 1989 and received a permit in June 1992.

- In order to maintain a safe environment for training activities at the NCFTC, the County and the Town had previously agreed to jointly study the occurrence of subsurface combustible gas on the NCFTC and recommend appropriate remedial measures. That agreement was formalized in a document entitled, Town of Oyster Bay Landfill/Fireman's Training Center Subsurface Gas Sampling Program Work Scope, Malcolm Pirnie, Inc., November, 1988, (the Work Scope). After completion of the Phase I activities outlined in the Work Scope, the parties agreed that sufficient data resulting from the above was obtained to allow the remediation to proceed directly to the design phase of this project, thereby accelerating the remediation program.

In 1992, the County and Town signed a betterment agreement wherein both parties will jointly share in upgrading the Town's facilities in the areas of joint concern. The projected design of the improvements will provide for the installation of a skid mounted blower, a water separator package and three (3) landfill gas vents in the vicinity of the common border of the NCFTC/OBSWDC. The three landfill gas vents (LGV-5A, 5B, 7A) were installed in November, 1992. It is anticipated that the blower station improvements will be operable in early 1993.

In summary, the County and Town have concluded that,the improvements to the Town's gas control facilities currently under construction will control the potential for gas migration along the common border of the NCFTC/OBSWDC. With the completion of work currently under consideration by the County, all subsurface landfill gas along the common border of the NCFTC/OBSWDC should be effectively under control.

## SECTION 2

## SAMPLING

### 2.1 General

Sampling was performed by the following organizations:

- Town of Oyster Bay (TOB);
- Lockwood, Kessler & Bartlett, Inc. (LKB);
- RTP Environmental Associates, Inc. (RTP); and
- TRC Environmental Corporation (TRC).

RTP and TRC were contracted by LKB to assist in the preparation of necessary reports to comply with all of the requirements stipulated in the Consent Decree - RAP Attachment 2. RTP personnel conducted the sampling and analysis of ambient air and soil gases as well as the pressure sampling in the areas at and surrounding the OBSWDC. TRC conducted the emission measurement programs to characterize the air emission of the LFG Thermal Oxidizer at the OBSWDC.

### 2.2 Monitoring Equipment Operation

Specific monitoring equipment used by the parties are as follows:

- TOB and LKB: MSA Model 60 Combustible Gas Indicator.
- RTP: Monitoring equipment and sampling protocols utilized by RTP for the Ambient Air Quality and Soil Gas Quality Surveys are presented in Appendix C, (attached herewith).
- TRC: Monitoring equipment and sampling protocols utilized by TRC, for the Landfill Gas Thermal Oxidizer Emissions Tests are presented in Appendix D (attached herewith.

The sampling protocols utilized by both the Town and LKB include the following:

Prior to sampling, certain monitoring equipment instructions are to be read and precautions undertaken to assure proper equipment (MSA Model 60 Combustible Gas Indicator) operation. First, the instrument is calibrated (prior to sampling) using a check gas cylinder with a known methane gas concentration. Second, the aspirator bulb is squeezed to purge the instrument with fresh air so that readings do not reflect contamination from prior readings. Lastly, excessive liquid quantities are prevented from entering the instrument during sampling (these instruments contain water traps which prevent liquids from being inadvertently drawn). In addition to the above, the Town and LKB regularly send their instruments to the manufacturer for calibration, maintenance and repairs to assure proper equipment operation.

Sampling data collected by TOB and LKB personnel, using the MSA Model 60 Combustible Gas Indicator, yield readings that are expressed on a scale which measure the concentration of combustible gas present by volume.

The sampling procedures, utilized by TOB and LKB personnel, were performed according to the monitoring schedule recommended in the 1991 Annual Report Summarizing the Results of Landfill Gas Monitoring Programs at the Old Bethpage Solid Waste Disposal Complex and Adjacent Areas (LKB, June, 1992). This report developed sampling programs in potentially hazardous areas on the NCFTC grounds, and areas on-site and off-site of the OBSWDC.

## 2.3 Current Gas Monitoring

There are presently a number of gas monitoring programs at the OBSWDC implemented to locate and/or detect areas of off-site LFG migration. The annual facility and site survey, conducted by LKB personnel, presents data used to ascertain the extent of LFG migration along the OBSWDC boundary. The site survey also assesses the effectiveness of the Phase 1, 2 and 3 gas control and recovery systems in preventing off-site landfill gas migration onto NCFTC property and buildings adjacent to Winding, Round Swamp and Claremont Roads. Data obtained in the site survey are ultimately used to develop remedial programs for the modification and expansion of gas control and recovery systems, if necessary. Also, LKB personnel annually monitor the Nassau County Department of Parks and Recreation Battle Row Campground (The Campground) for the presence of off-site LFG migration.

Town of Oyster Bay personnel monitor the permanent sampling probes (Monthly Monitoring Survey) on a monthly basis to provide early warning in the event any off-site migration occurs onto NCFTC property or beyond the OBSWDC property boundary (Figures 1, 2 and 3). The monthly monitoring survey is also used to determine subsurface landfill gas concentrations.

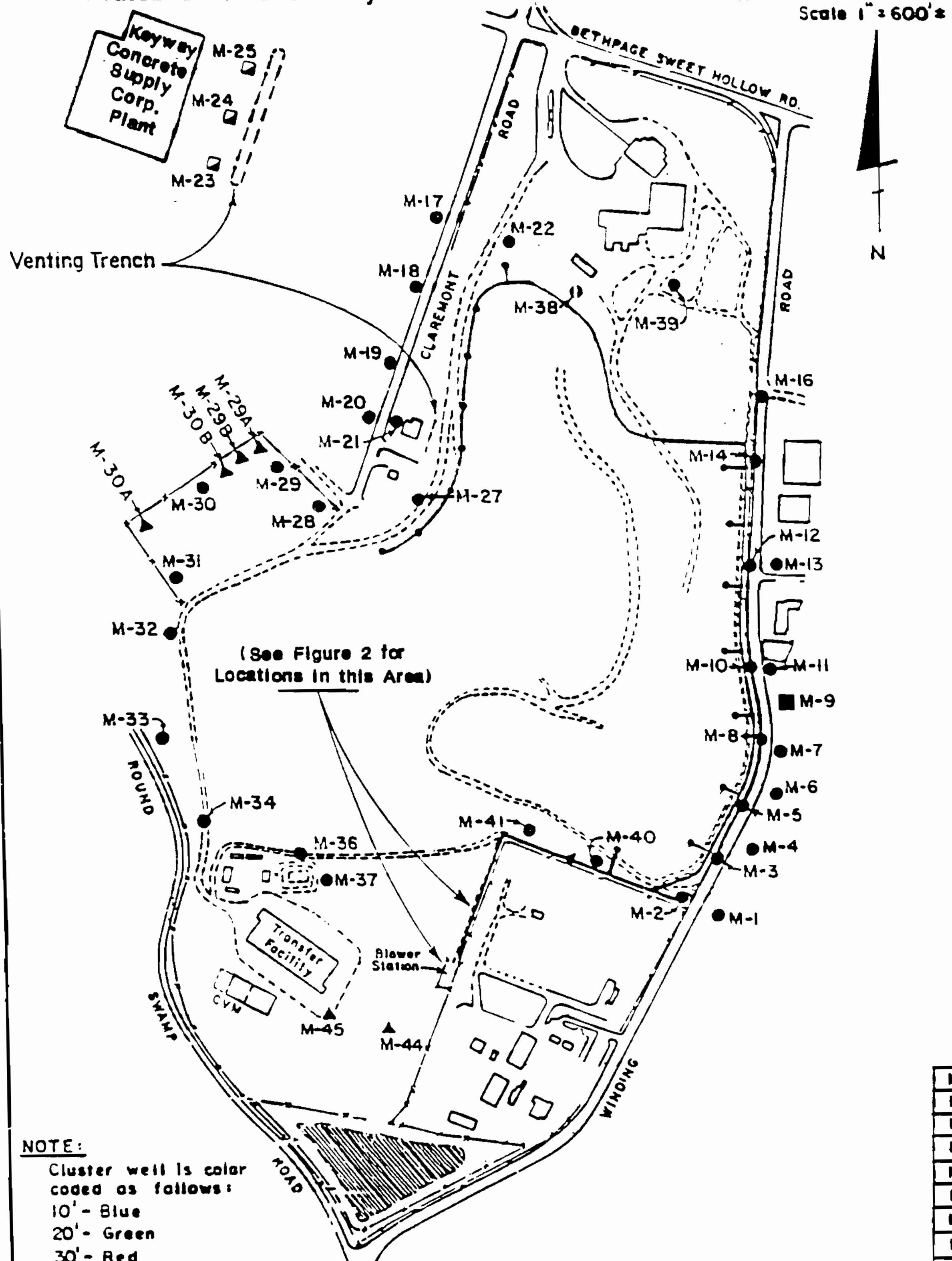
In addition to the previously mentioned TOB survey, Town of Oyster Bay personnel monitor (on a monthly basis) various locations at commercial properties immediately adjacent to the OBSWDC along Winding, Round Swamp and Claremont Roads, and in buildings located at the OBSWDC (Figures 4, 5, 6 and 7). This survey (Adjacent Building Structures and Incinerator Complex Survey), was initiated as a result of the reported elevated levels of combustible gas on May 31, 1983, at the Key Way Concrete Supply Corp. Plant located at 100 Battle Row.

Lastly, Town of Oyster Bay personnel monitor (on a monthly basis) various points located in the interior and exterior of five (5) building structures immediately adjacent to the OBSWDC. This survey (Senior Citizen Housing Combustible Gas Survey) is conducted at the Senior Citizen Complex (Figure 8) which is located west of the OBSWDC. The Senior Citizen Complex is bounded by the property boundary of the OBSWDC, Round Swamp Road and Battle Row.

Data obtained by TOB personnel in the three (3) monthly surveys (OBSWDC, ABSIC and SCHCG Surveys) are then sent to LKB

# 1992 PERIMETER MONITORING POINTS AT OBSWDC

**(Results of this Survey are Presented in Table 1)**




| SAMPLE LOCATION | COMBUSTIBLE GAS (%) |
|---|---|
| M-1 | |
| M-2 | |
| M-3 | |
| M-4 | |
| M-5 | |
| M-6 | |
| M-7 | |
| M-8 | |
| M-9 | |
| -10' | |
| -20' | |
| -40' | |
| M-10 | |
| M-11 | |
| M-12 | |
| M-13 | |
| M-14 | |
| M-16 | |
| M-17 | |
| M-18 | |
| M-19 | |
| M-20 | |
| M-21 | |
| M-22 | |
| M-23 | |
| M-24 | |
| M-25 | |
| M-27 | |
| M-28 | |
| M-29 | |
| M-30 | |
| M-31 | |
| M-32 | |
| M-33 | |
| M-34 | |
| M-36 | |
| M-37 | |
| M-38 | |
| M-39 | |
| M-40 | |
| M-41 | |
| M-44 Upper | |
| M-44 Lower | |
| M-45 Upper | |
| M-45 Lower | |
| M-29A Upper | |
| M-29A Lower | |
| M-29B Upper | |
| M-29B Lower | |
| M-30A Upper | |
| M-30A Lower | |
| M-30B Upper | |
| M-30B Lower | |

NOTE:
Cluster well is color coded as follows:
10' - Blue
20' - Green
30' - Red
40' - Yellow

LEGEND:

- ● Denotes Single Point Sampling Probe, Depth 30".
- ■ Denotes Cluster Well. Depth 10', 20', 30' and 40'.
- ▲ Denotes Cluster Well, Varying Depth.
- ◪ Denotes Single Point Sampling Probe. Depth 8'.
- NS Denotes that No Sample was Obtained Due to Water in Sampling Location.

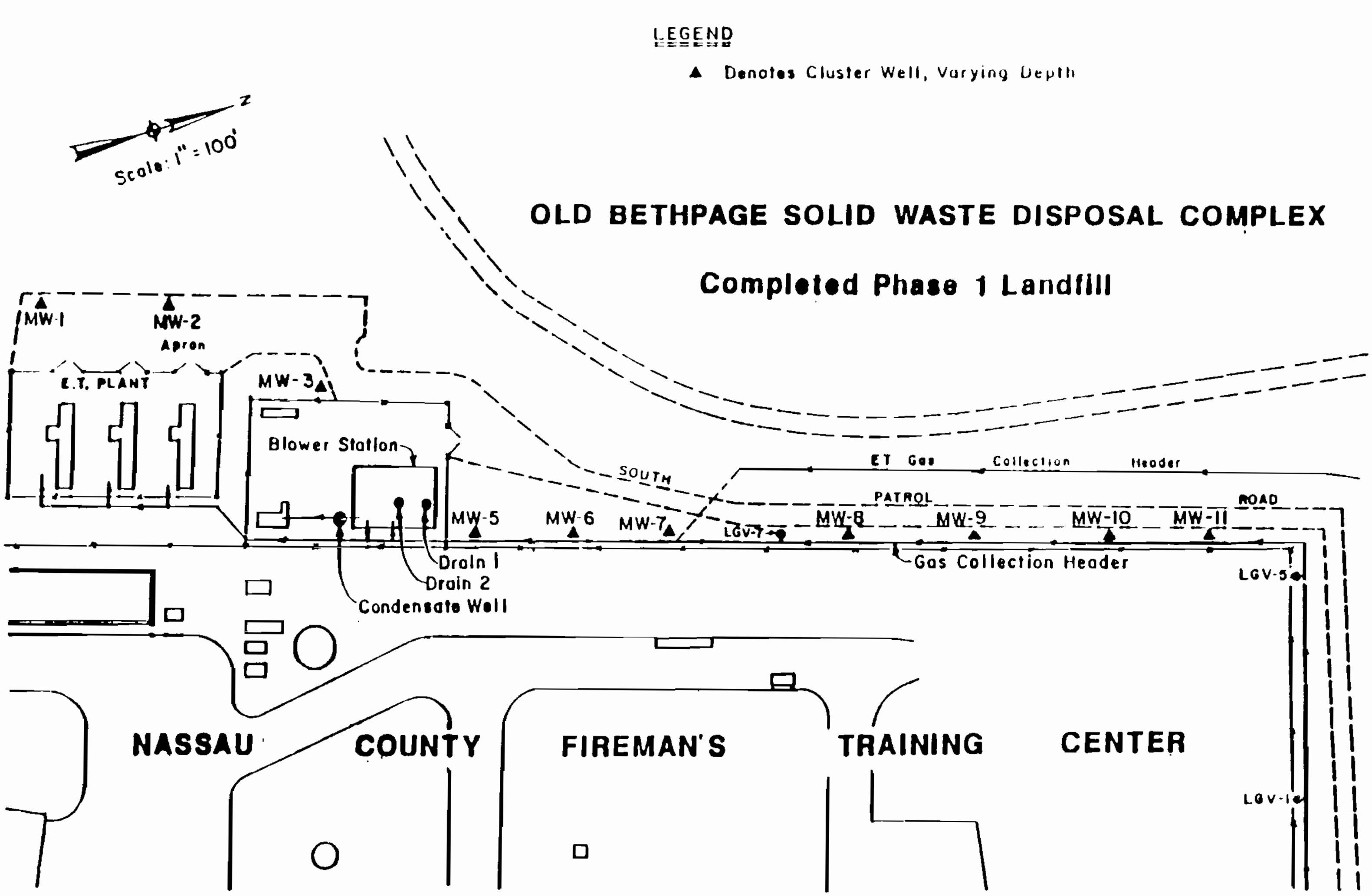
**FIGURE 1**

TOWN OF OYSTER BAY NEW YORK 1653

LKB LOCKWOOD, KESSLER & BARTLETT, INC.
ONE AERIAL WAY, SYOSSET, NEW YORK 11791

6014-14

MAY 1993




| SAMPLE LOCATION | | % COMBUSTIBLE GAS |
|---|---|---|
| MW-1 | Upper | |
| MW-1 | Lower | |
| MW-2 | Upper | |
| MW-2 | Lower | |
| MW-3 | Upper | |
| MW-3 | Lower | |
| MW-5 | Upper | |
| MW-5 | Lower | |
| MW-6 | Upper | |
| MW-6 | Lower | |
| MW-7 | Upper | |
| MW-7 | Lower | |
| MW-8 | Upper | |
| MW-8 | Lower | |
| MW-9 | Upper | |
| MW-9 | Lower | |
| MW-10 | Upper | |
| MW-10 | Lower | |
| MW-11 | Upper | |
| MW-11 | Lower | |
| Drain 1 | | |
| Drain 2 | | |
| Condensate Well | | |

(Results of this Survey are Presented in Table 1)

FIGURE 2

# 1992 PERIMETER MONITORING POINTS AT OBSWDC

TOWN OF OYSTER BAY 1653 NEW YORK

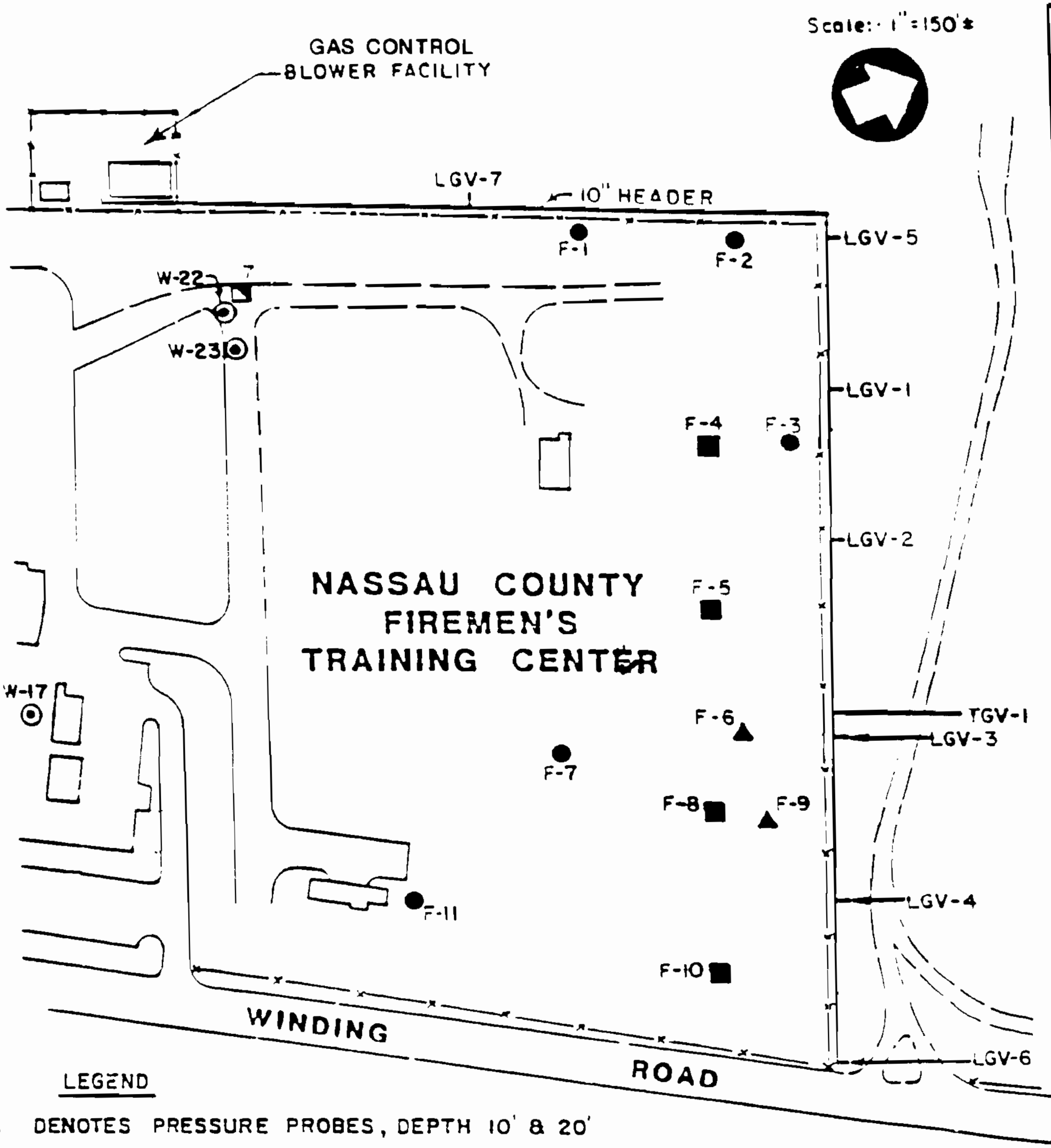
LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS SYOSSET, NEW YORK

6014-14

MAY 1993

# 1992 MONITORING POINTS AT THE FIREMANS TRAINING CENTER

**(Results of this Survey are Presented in Table 2)**




LEGEND

▲ DENOTES PRESSURE PROBES, DEPTH 10' & 20'

■ DENOTES CLUSTER WELLS, DEPTH 10', 20', 30' & 40'

● DENOTES SINGLE POINT SAMPLING PROBES, DEPTH 30"

DENOTES PHASE I GAS SYSTEM

NS DENOTES THAT NO SAMPLE WAS OBTAINED DUE TO WATER IN SAMPLING LOCATION

⊙ DENOTES NASSAU COUNTY MONITORING WELL

◪ DENOTES NASSAU COUNTY MONITORING DRYWELL

| SAMPLE LOCATION | % COMBUSTION GAS |
|---|---|
| F-1 | |
| F-2 | |
| F-3 | |
| F-4 | |
| AT 10 | |
| 20' | |
| 30' | |
| 40 | |
| F-5 | |
| 10 | |
| 20' | |
| 30' | |
| 40' | |
| F-6 | |
| 10' | |
| 20 | |
| F-7 | |
| F-8 | |
| 10' | |
| 20' | |
| 30' | |
| 40 | |
| F-9 | |
| 10' | |
| 20' | |
| F-10 | |
| 10' | |
| 20' | |
| 30' | |
| 40' | |
| F-11 | |
| W-17 | |
| W-22 | |
| W-23 | |
| 7 | |

NOTES

1.) CLUSTER WELLS ARE COLOR CODED AS FOLLOWS
10'-BLUE, 20'-GREEN, 30'-RED, 40'-YELLOW

2.) PRESSURE PROBES ARE COLOR CODED AS FOLLOWS
10'-BLUE, 20'-GREEN

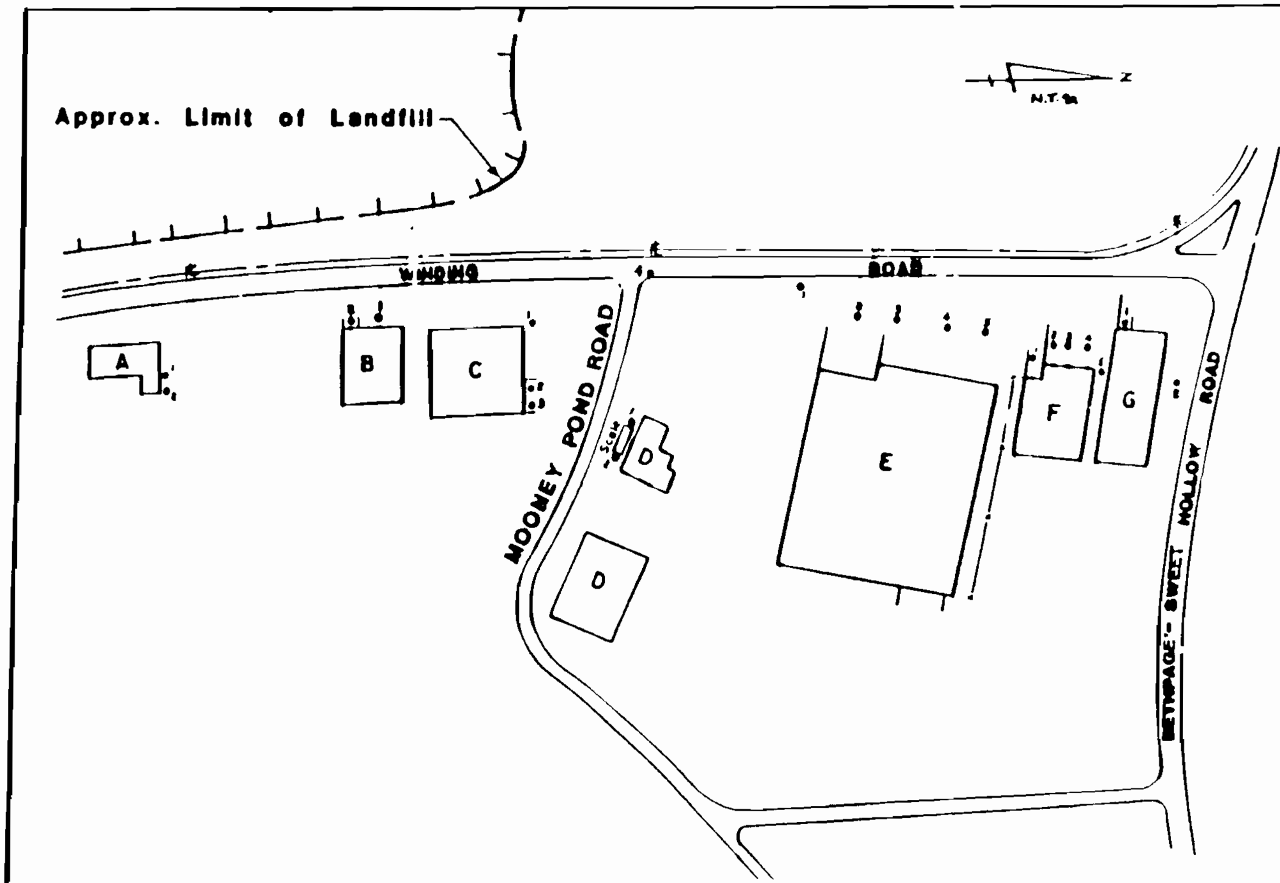
FIGURE 3

LOCKWOOD, KESSLER & BARTLETT, INC.
ONE AERIAL WAY SYOSSET, NEW YORK 11791

MAY 1993

6014-14

Approx. Limit of Landfill




| SAMPLE LOCATION | SAMPLE DESCRIPTION | % COMBUSTIBLE GAS |
|---|---|---|
| (A) 499 WINDING RD. | | |
| 1 | Hole | |
| 2 | Hole | |
| (B) 459 WINDING RD. | | |
| 1 | Drain | |
| 2 | Dock | |
| (C) 445 WINDING RD. | | |
| 1 | Drain | |
| [illegible] | Drain | |
| [illegible] | Drain | |
| 4 | Drain | |
| (D) 311 WINDING RD. | | |
| 1 | Scale | |
| 2 | Scale | |
| (E) 303 WINDING RD. | | |
| [illegible] | Drain | |
| [illegible] | Drain | |
| [illegible] | Drain | |
| [illegible] | Drain | |
| [illegible] | Drain | |

| SAMPLE LOCATION | SAMPLE DESCRIPTION | % COMBUSTIBLE GAS |
|---|---|---|
| (F) 310 WINDING RD. | | |
| [illegible] | Drain | |
| [illegible] | Drain | |
| [illegible] | Drain | |
| [illegible] | Drain | |
| [illegible] | Drain | |
| (G) 161 BETHPAGE-SWEET HOLLOW RD | | |
| 1 | Drain | |
| 2 | Drain | |

NOTE:
NS-Denotes that no sample was obtained due to water in sampling location.

**(Results of this Survey are presented in Table 3)**

**FIGURE 4**

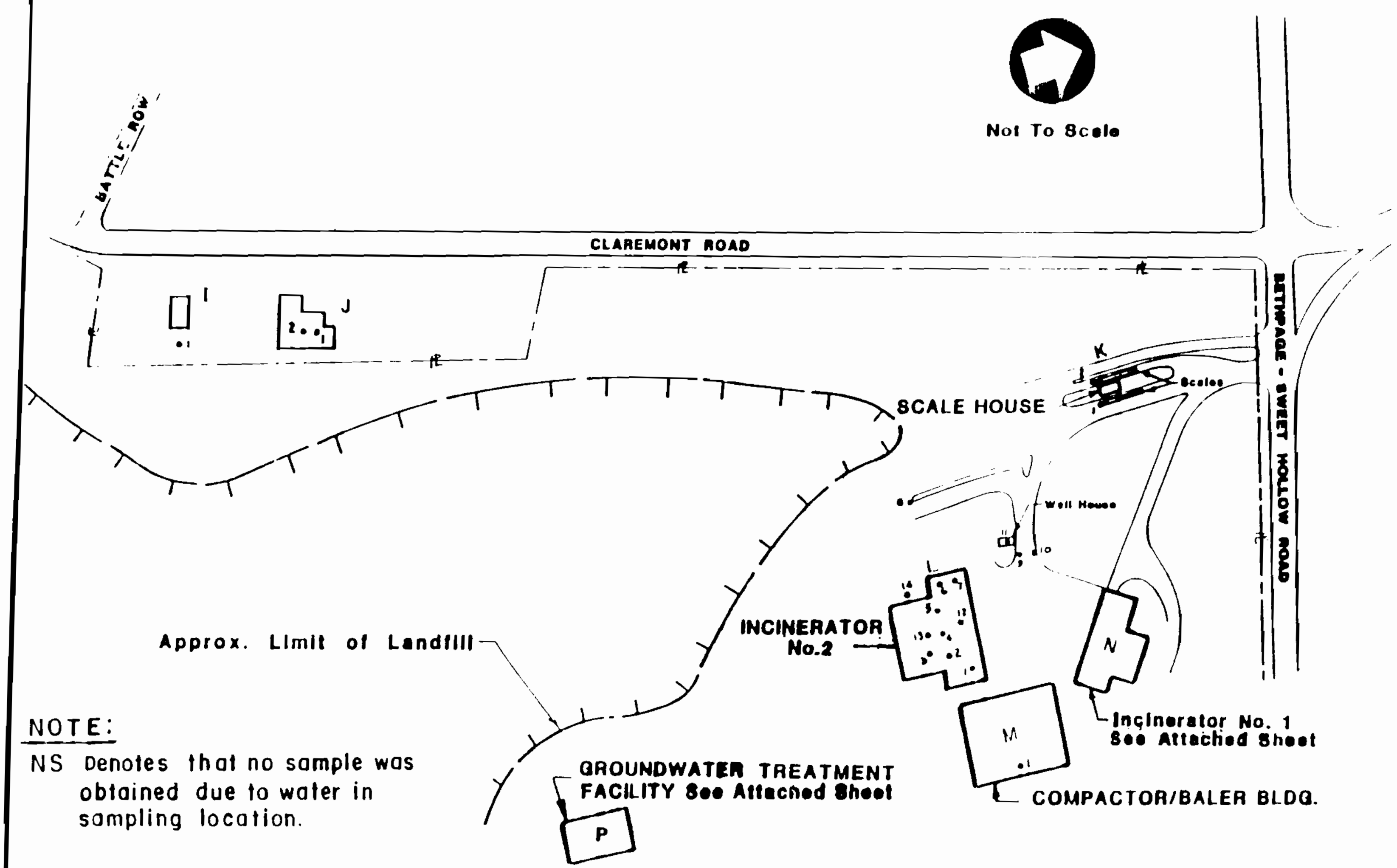
**ADJACENT BUILDING STRUCTURES AND INCINERATOR COMPLEX SURVEY**

TOWN OF OYSTER BAY · NEW YORK · 1653

LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS
SYOSSET, NEW YORK

6014-14

MAY 1993




| SAMPLE LOCATION | SAMPLE DESCRIPTION | % COMBUSTIBLE GAS |
|---|---|---|
| (I) 90 BATTLE ROW | | |
| 1 | Drain | |
| (J) 100 BATTLE ROW | | |
| 1 | Drain | |
| 2 | Hole | |
| (K) SCALE HOUSE | | |
| 1 | Scale | |
| 2 | Scale | |
| (L) INCINERATOR PLANT NO. 2 | | |
| 1 | Drain | |
| 2 | Drain | |
| 3 | Drain | |
| 4 | Drain | |
| 5 | Hole | |
| 6 | Drain | |
| 7 | Drain | |
| 8 | Drain | |
| 9 | Drain | |
| 10 | Drain | |
| 11 | Pit | |
| 12 | Grate | |
| 13 | Drain | |
| 14 | Drain | |
| (M) COMPACTOR/BALER BUILDING | | |
| 1 | Drain | |

NOTE:
NS Denotes that no sample was obtained due to water in sampling location.

FIGURE 5

# ADJACENT BUILDING STRUCTURES & INCINERATOR COMPLEX SURVEY

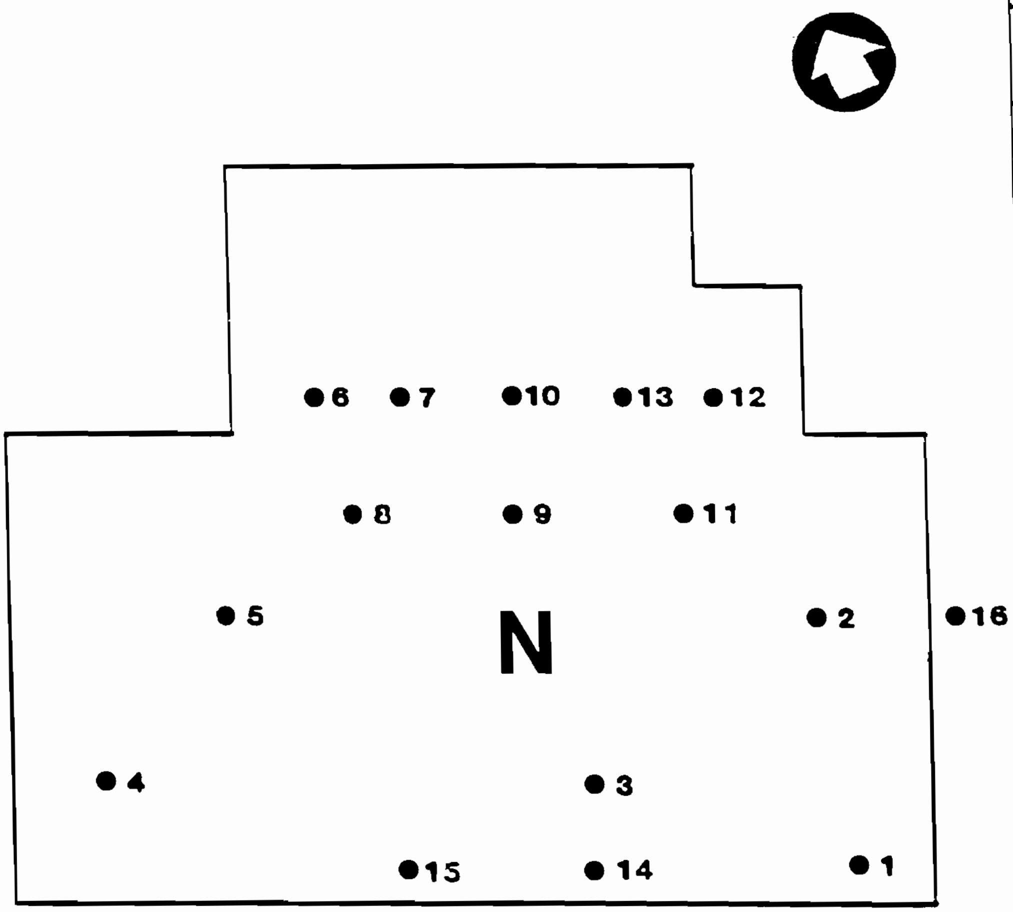
TOWN OF OYSTER BAY 1653 NEW YORK

LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS
SYOSSET, NEW YORK

6014-14

MAY 1993

# ADJACENT BUILDING STRUCTURES & INCINERATOR COMPLEX SURVEY




ASH FLOOR

INCINERATOR No. 1

**(Results of this Survey are presented in Table 3)**

| SAMPLE LOCATION | SAMPLE DESCRIPTION | % COMBUSTIBLE GAS |
|---|---|---|
| (N) INCINERATOR PLANT NO. 1 | | |
| 1 | Drain | |
| 2 | Drain | |
| 3 | Hole | |
| 4 | Drain | |
| 5 | Drain | |
| 6 | Drain | |
| 7 | Hole | |
| 8 | Drain | |
| 9 | Drain | |
| 10 | Drain | |
| 11 | Hole | |
| 12 | Drain | |
| 13 | Drain | |
| 14 | Hole | |
| 15 | Hole | |
| 16 | M.H. | |

NOTE:

NS Denotes that no sample was obtained due to water in sampling location.

FIGURE 6

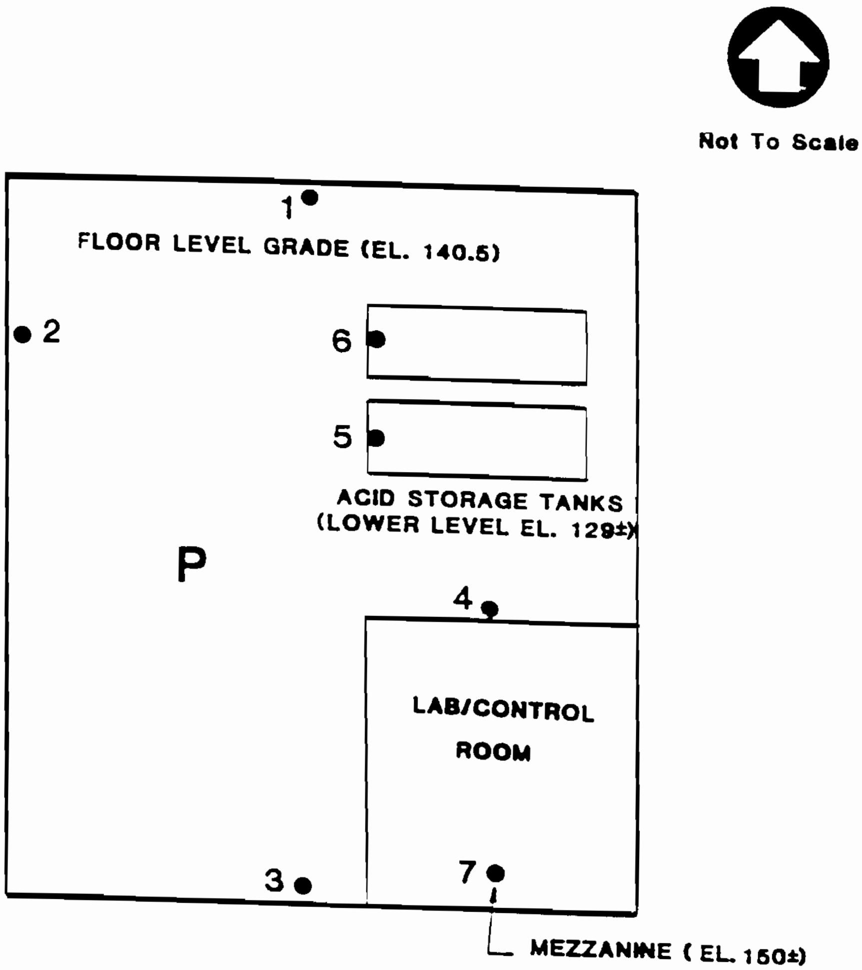
TOWN OF OYSTER BAY 1653 NEW YORK

LOCKWOOD, KESSLER & BARTLETT, INC.
CONSULTING ENGINEERS
SYOSSET, NEW YORK

6014-14

MAY 1993

# ADJACENT BUILDING STRUCTURES & INCINERATOR COMPLEX SURVEY




| SAMPLE LOCATION | SAMPLE DESCRIPTION | % LOWER EXPLOSIVE LIMIT (L.E.L.) |
|---|---|---|
| 1 | Sensor | |
| 2 | Sensor | |
| 3 | Sensor | |
| 4 | Sensor | |
| 5 | Sensor | |
| 6 | Sensor | |
| 7 | Sensor | |

## GROUNDWATER TREATMENT FACILITY

FIGURE 7

TOWN OF OYSTER BAY · NEW YORK · 1653

LKB
LOCKWOOD, KESSLER & BARTLETT, INC.
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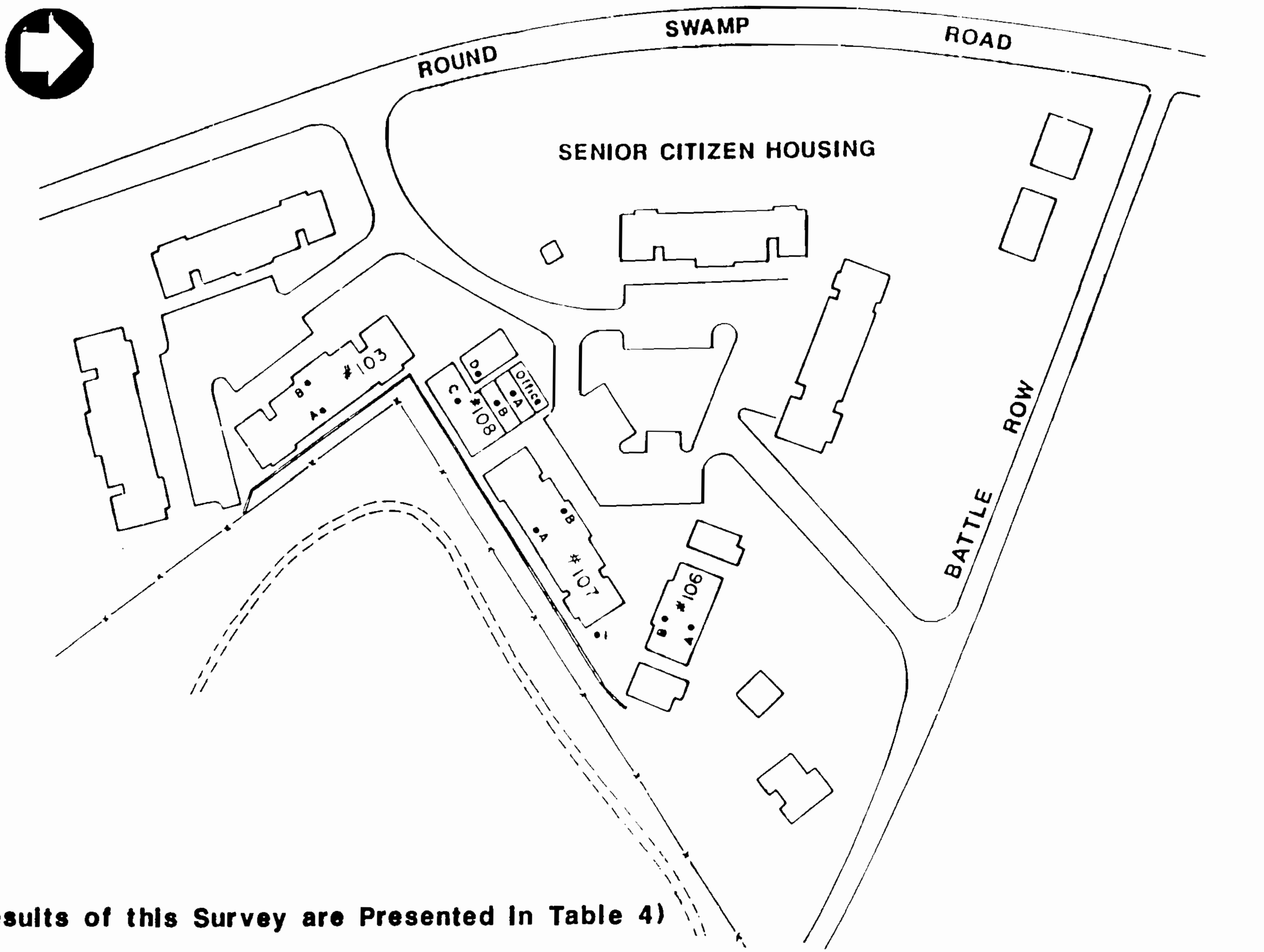


| SAMPLE LOCATION | SAMPLE DESCRIPTION | % COMBUSTIBLE GAS |
|---|---|---|
| 103A | Drain | |
| 103B | Drain | |
| 106A | Drain | |
| 106B | Drain | |
| 107A | Drain | |
| 107B | Drain | |
| 108A | Drain | |
| 108B | Drain | |
| 108C | Ambient | |
| 108D | Drain | |
| 1 | Drain | |
| | | |
| | | |
| | | |
| | | |
| | | |

(Results of this Survey are Presented In Table 4)

FIGURE 8

# TOWN OF OYSTER BAY
# SENIOR CITIZEN HOUSING
# COMBUSTIBLE GAS SURVEY

TOWN OF OYSTER BAY 1653 NEW YORK

LKB LOCKWOOD, KESSLER & BARTLETT, INC.
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for analysis and evaluation. LKB then prepares an evaluation of data report based on the monthly combustible gas data.

In early November 1987, Nassau County personnel installed two (2) groundwater monitoring wells (to the groundwater table) at the NCFTC. The wells were constructed to determine the possible levels of groundwater contamination caused by the NCFTC's use of petroleum products over the years in their firefighting drills. During the course of this work, aside from the few inches of petroleum products found in the upper portion of the groundwater, the County also discovered the presence of significant levels of combustible gas in the two wells and notified the Town of this occurrence. After apparently finding steady combustible gas levels in the wells for 48 hours, a meeting was held to discuss the situation.

In an effort to better appraise the extent and cause of the problem, the Town initiated a daily monitoring on November 6, 1987 of the Town's sampling probes at the NCFTC as well as the two (2) groundwater wells and an on-site manhole. In April 1988, subsequent to the daily monitoring program, the Town as part of the subsurface soil boring program installed ten (10) new cluster wells (varying depths) along the western property boundary of the NCFTC to generate additional data. These locations were monitored daily by Town personnel until August 30, 1989. Subsequent sampling at these locations was conducted weekly by TOB personnel.

Over the last three years, the Town has voluntarily conducted a considerable amount of landfill gas monitoring (at various times on a daily, semi-weekly and weekly basis), in and around the vicinity of the NCFTC. This voluntary sampling was conducted at locations within the NCFTC and at the cluster wells located along the western property boundary of the NCFTC. This monitoring was over and above that which was required for these locations, namely a monthly monitoring.

As of the week of November 12, 1990, the Town has reverted to a monthly sampling of these locations since these areas and gas concentrations are well defined and it is no longer necessary to continue to collect this data on a weekly basis. As with all other monitoring, the Town will continue to monitor these locations on a monthly basis unless conditions warrant a more frequent sampling schedule, in which case the Town will revert to a sampling schedule consistent with the warranted conditions (as has always been the Town's policy).

The above site and monitoring programs conducted by TOB and LKB personnel will continue after capping programs at the OBSWDC so that any changes in landfill gas migration will be detected and further remedial actions initiated, if necessary. The monitoring locations and their associated monitoring frequencies are listed in Appendix A.

## SECTION 3

## DISCUSSION OF RESULTS

### 3.1 General

Two types of sampling programs were developed in the Comprehensive Land Use and Operations Plan, (LKB, October 1983). These programs were conducted at:

- various site locations in the vicinity of the Old Bethpage Solid Waste Disposal Complex, and;
- areas where potential safety hazards exist (buildings, facilities, etc.).

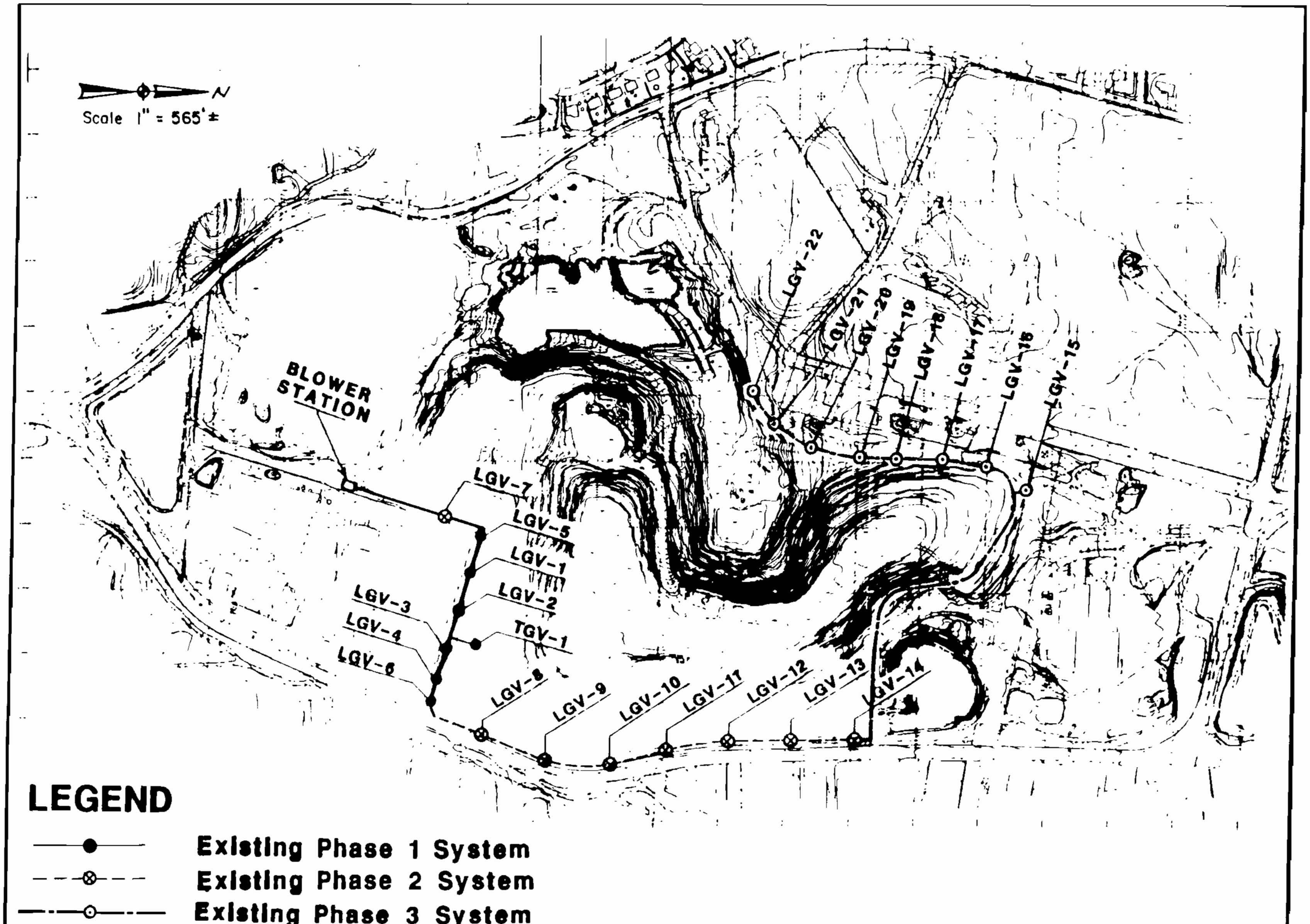
A program of the first type, developed for the Old Bethpage Solid Waste Disposal Complex and vicinity, is described in Section 3.2. A program of the second type, developed for the NCFTC, adjacent building structures, incinerator complex, Nassau County Campground and the Senior Citizen Housing is described in Section 3.3.

Sampling data generated from these programs are used to detect potential problematic areas and develop design parameters for modification and expansion of LFG control and recovery systems, if necessary. At present, these LFG control systems extend along the northern and western sides of the NCFTC, along Winding Road and along the northwestern portion of the OBSWDC adjacent to Claremont Road (see Figure 9).

### 3.2 Landfill Gas Migration

The following LFG surveys were conducted to establish the extent of landfill gas migration both on and off-site of the Old Bethpage Solid Waste Disposal Complex:

- site survey; and,




# FIGURE 9: LOCATION OF PHASE 1, 2 & 3 GAS CONTROL & RECOVERY SYSTEMS

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- monthly monitoring survey.

All data pertaining to these surveys is compiled on Drawing 1, Table 1 and Table 2.

### 3.2.1 Site Survey

A site monitoring program, consisting of sampling points exploring the lateral migration of LFG around the outer boundary of the OBSWDC site, was conducted by LKB personnel from March 31 to April 29, 1992. Three-quarter inch (3/4") bar holes were punched approximately 30 inches deep and spaced 50 feet apart along the outer boundary of the OBSWDC. The survey was continued radially inward or outward, depending upon whether a positive or zero percent combustible gas reading was obtained at the perimeter sampling points. The collected data was then used to plot the combustible gas migration contour (line of zero percent combustible gas readings) around the OBSWDC.

The data compiled in this current study is presented graphically on Drawing No. 1 (Old Bethpage Solid Waste Disposal Complex - Zero Percent Combustible Gas Migration Contours 1992 Annual Site Survey). This data compares the combustible gas migration contour compiled this year with the previously established August 1990 and August 1991 contours.

Drawing No. 1 illustrates the extent of off-site LFG migration at the OBSWDC site in this year's survey:

- As can be seen from the plotted results of this year's Annual Site Survey, off-site landfill gas migration has been contained around the entire OBSWDC boundary and is confined to areas located within the OBSWDC property boundaries.

TABLE 1
1992 MONTHLY MONITORING SURVEY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX
TOWN OF OYSTER BAY
PERCENT COMBUSTIBLE GAS

| Weather<br>Temp.<br>Bar. Pr. | Sunny<br>27°<br>30.36 ↔ | Cloudy<br>40°<br>29.88↑ | Sunny<br>31°<br>30.16↑ | Cloudy<br>42°<br>29.86↓ | Sunny<br>62°<br>30.26 ↔ | Sunny<br>65°<br>29.86↑ | Sunny<br>62°<br>29.92↑ | Cloudy<br>70°<br>30.00 ↔ | Pt.Cloudy<br>60°<br>29.96 ↔ | Sunny<br>40°<br>29.98↓ | Rain<br>50°<br>29.99↑ | Rain<br>40°<br>30.45↓ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date<br>Location * | Jan 28 | Feb 20 | Mar 18 | Apr 27 | May 29 | June 26 | Jul 29 | Aug 27 | Sep 29 | Oct 29 | Nov 27 | Dec 29 |
| M-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-9 | | | | | | | | | | | | |
| @10' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @20' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @30' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @40' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-32 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-33 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-36 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-37 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-38 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-39 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-40 | 2 | 1 | 0 | 11 | 0 | 0 | 1.5 | 0 | 60 | 56 | 12 | 3 |
| M-41 | 60 | 66 | 50 | 68 | 67 | 54 | 56 | 56 | 60 | 60 | 38 | 38 |

Notes:

*: All sampling locations presented in Table 1 are shown in Figure 1.

(Continued)

TABLE 1 (CONTINUED)
1992 MONTHLY MONITORING SURVEY
OLD BETHPAGE SOLID WASTE DISPOSAL COMPLEX
TOWN OF OYSTER BAY
PERCENT COMBUSTIBLE GAS

| Weather | Sunny | Cloudy | Sunny | Cloudy | Sunny | Sunny | Sunny | Cloudy | Pt.Cloudy | Sunny | Rain | Rain |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temp. | 27° | 40° | 31° | 42° | 62° | 65° | 62° | 70° | 60° | 40° | 50° | 40° |
| Bar. Pr. | 30.36 ↔ | 29.88 ↑ | 30.16 ↑ | 29.86 ↓ | 30.26 ↔ | 29.86 ↑ | 29.92 ↑ | 30.00 ↔ | 29.96 ↔ | 29.98 ↓ | 29.99 ↑ | 30.45 ↓ |
| Date / Location * | Jan 28 | Feb 20 | Mar 18 | Apr 27 | May 29 | June 26 | Jul 29 | Aug 27 | Sep 29 | Oct 29 | Nov 27 | Dec 29 |
| M-44 Upper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-44 Lower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-45 Upper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-45 Lower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-29A Upper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-29A Lower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-30A Upper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-30A Lower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-29B Upper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-29B Lower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-30B Upper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-30B Lower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-1 Upper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-1 Lower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-2 Upper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-2 Lower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-3 Upper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-3 Lower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-5 Upper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-5 Lower | 4 | 6 | 3 | 2 | 0 | 0 | 0.3 | 0.5 | 0.9 | 0 | 1.5 | 1.5 |
| MW-6 Upper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-6 Lower | 7 | 0 | 8 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-7 Upper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-7 Lower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-8 Upper | 0 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0.2 | 0 | 0 | 0 |
| MW-8 Lower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mw-9 Upper | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-9 Lower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-10 Upper | 0 | 0.8 | 0 | 0 | 0 | 0 | 0 | 0 | 4.3 | 0 | 0 | 0 |
| MW-10 Lower | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MW-11 Upper | 0 | 0,4 | 0 | 0 | 0 | 0 | 0.3 | 0 | 0.7 | 0.7 | 0 | 0 |
| MW-11 Lower | 34 | 38 | 30 | 40 | 30 | 34 | 34 | 38 | 42 | 32 | 36 | 0 |
| Drain 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Drain 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Conden. Well | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Notes:

*: All sampling locations presented in Table 1 are shown in Figures 1 and 2.

TABLE 2
1992 MONTHLY MONITORING SURVEY
NASSAU COUNTY FIREMAN'S TRAINING CENTER
TOWN OF OYSTER BAY
PERCENT COMBUSTIBLE GAS

| Weather<br>Temp.<br>Bar. Pr. | Sunny<br>27°<br>30.36 | Cloudy<br>40°<br>29.88 | Sunny<br>31°<br>30.16 | Cloudy<br>42°<br>29.86 | Sunny<br>62°<br>30.26 | Sunny<br>65°<br>29.86 | Sunny<br>62°<br>29.92 | Cloudy<br>70°<br>30.00 | Pt.Cloudy<br>60°<br>29.96 | Sunny<br>40°<br>29.98 | Rain<br>50°<br>29.99 | Rain<br>40°<br>30.45 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date<br>Location * | Jan 28 | Feb 20 | Mar 18 | Apr 27 | May 29 | June 26 | Jul 29 | Aug 27 | Sep 29 | Oct 29 | Nov 27 | Dec 29 |
| F-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-4 | | | | | | | | | | | | |
| @10' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @20' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @30' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @40' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-5 | | | | | | | | | | | | |
| @10' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @20' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @30' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @40' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-6 | | | | | | | | | | | | |
| @10' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @20' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-8 | | | | | | | | | | | | |
| @10' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @20' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @30' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @40' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-9 | | | | | | | | | | | | |
| @10' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @20' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-10 | | | | | | | | | | | | |
| @10' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @20' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @30' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| @40' | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W-17 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0.8 | 4 | 0 | 0 | 3 | 0 |
| W-22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W-23 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

NOTES :

*: All sampling locations presented in Table 2 are shown on Figure 3.

- All off-site areas, which in the past may have been experienced LFG migration, have been obviated of off-site landfill gas migration. The Town, however continues to monitor off-site areas at the NCFTC for the possibility of migration.

### 3.2.2 Monthly Monitoring Survey

As recommended in the 1991 Annual Report (LKB, June 1992), a monthly monitoring survey was conducted at the OBSWDC and the NCFTC to provide early detection in the event any off-site LFG migration occurred both onto NCFTC property or beyond the OBSWDC property boundary. Readings measured by TOB personnel were taken from one-inch diameter single point sampling probes most of which are installed 30 inches deep (except for four (4) which are set 8 feet deep (Figure 10)), pressure probes at depths of 10 and 20 feet (Figure 11), cluster wells ranging in depth from 10 to 40 feet (Figure 12) and varying depth cluster wells (Figure 13).

In this year's monthly monitoring survey (January to December 1992), 72 points located along the OBSWDC property boundary and at the NCFTC were monitored for the presence of combustible gas. Data obtained by Town personnel in this survey were then recorded on standard monthly monitoring forms (Figures 1, 2 and 3) and sent to LKB for analysis and evaluation.

Upon completion of LKB's data analysis and evaluation, a monthly letter report is transmitted by LKB to the Town. Comments include possible causes of LFG readings at specific locations as well as present and future remedial actions which may be required to obviate any off-site migration of LFG, if encountered.

The following is a discussion of results based on the data obtained by the Town in this year's survey. Sampling probes

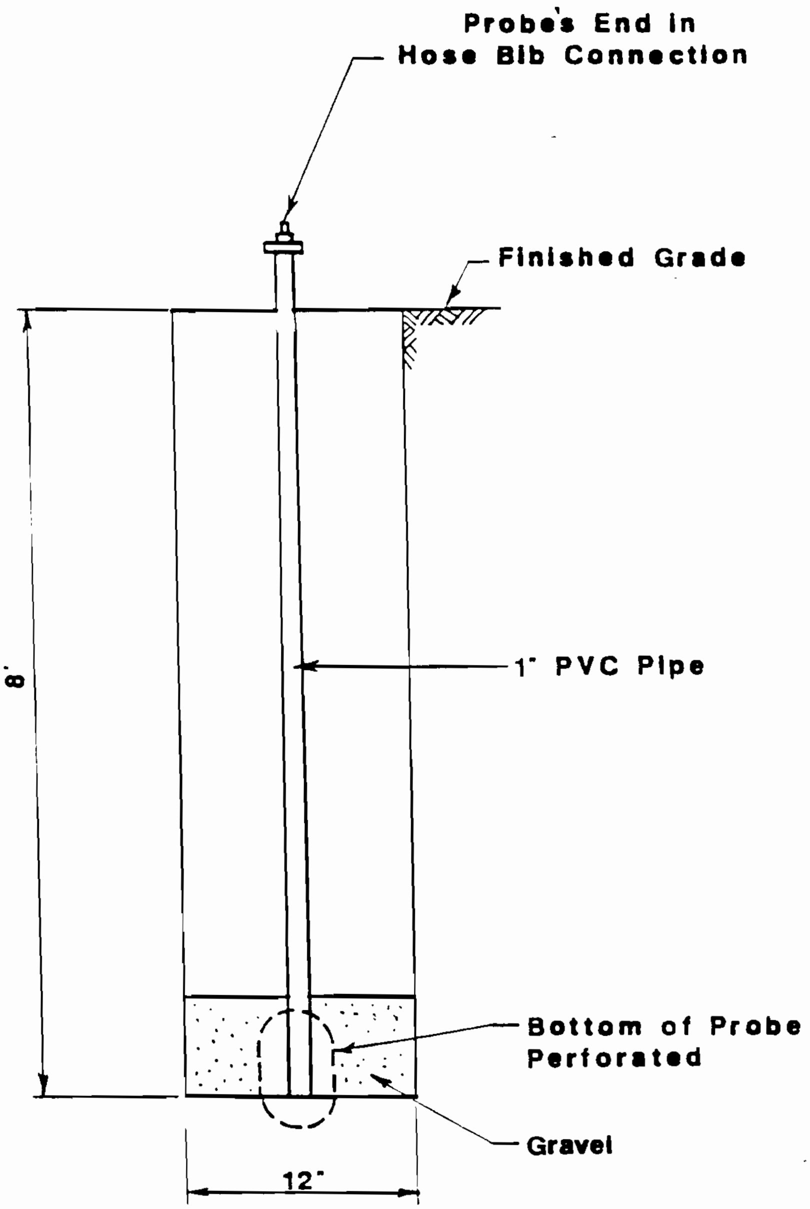


**FIGURE 10 : SINGLE POINT SAMPLING PROBE**

NOT TO SCALE
ALL DIMENSIONS APPROXIMATE

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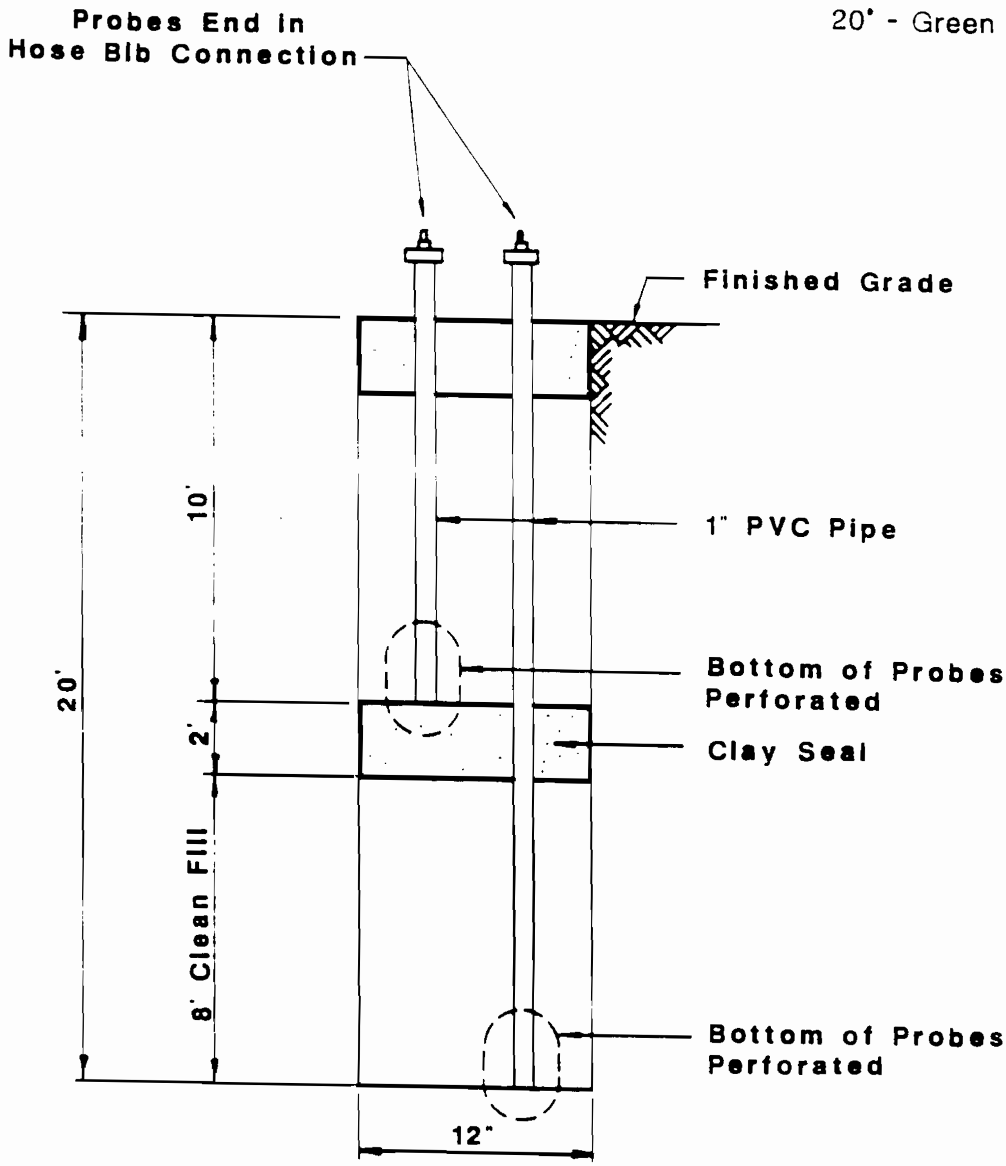
NOTE:

Each probe shall be color coded with waterproof tape as follows:

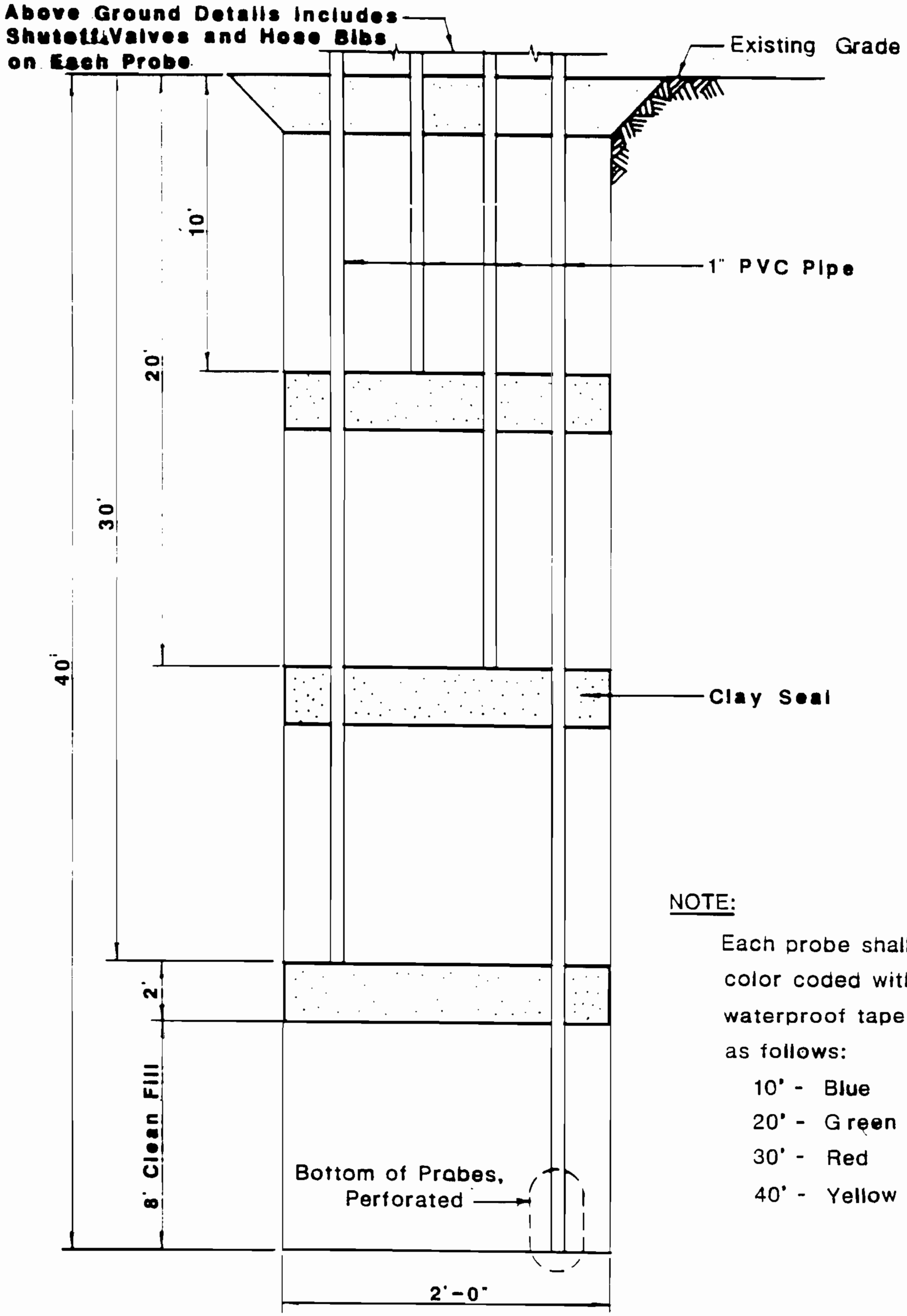
10' - Blue

20' - Green




# FIGURE 11: PRESSURE PROBE

NOT TO SCALE
ALL DIMENSIONS APPROXIMATE




NOTE:

Each probe shall be color coded with waterproof tape as follows:

10' - Blue
20' - Green
30' - Red
40' - Yellow

FIGURE 12: **CLUSTER WELL**

**Not to Scale**

**All Dimensions Approximate**

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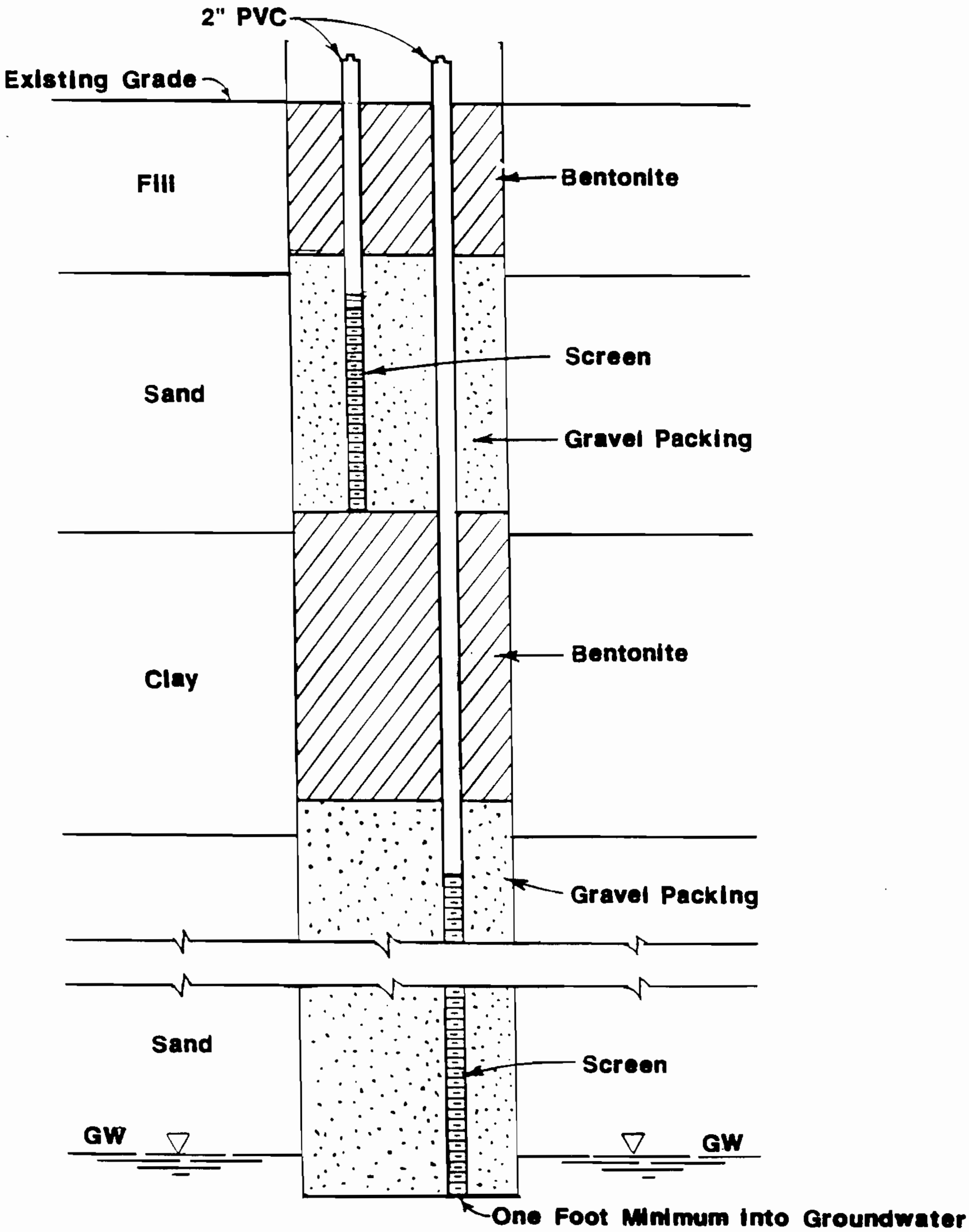


# FIGURE 13 : VARYING DEPTH CLUSTER WELL

Not to Scale
All Dimensions Approximate

LOCKWOOD, KESSLER & BARTLETT, INC.



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utilized are located at the NCFTC and along the OBSWDC property boundary (see Tables 1 and 2);

- At sampling locations M-40, M-41, MW-5 Lower, MW-8 Upper, MW-10 Upper and MW-11 Upper and Lower, the varying combustible gas concentrations (0.2 to 42% combustible gas) were anticipated since these sampling probes are located on-site and are therefore expected to yield some landfill gases.

- Combustible gas readings, ranging from 0.2 to 8% combustible gas, were measured by TOB personnel at Nassau County monitoring well W-17. This sampling point is located at the Nassau County Fireman's Training Center. As noted in last year's report, the Town as of November 12, 1990 has reverted to a monthly sampling of locations within the NCFTC in lieu of a weekly sampling schedule. As with all other monitoring, should conditions warrant a more frequent sampling schedule, the Town would implement a modified schedule.

- Negligible and/or zero percent combustible gas concentrations were measured by Town personnel at all the remaining OBSWDC and NCFTC sampling locations.

### 3.3 Facility Surveys

Additional combustible gas readings were measured at the following facilities:

- the NCFTC;
- buildings adjacent to the OBSWDC;
- former incinerator complex;
- the groundwater remediation facility;
- scalehouse;
- the Nassau County Campground; and

• Senior Citizen Housing.

All data pertaining to these facilities are compiled in Table 3, Table 4 and Drawing No. 1.

### 3.3.1 Nassau County Fireman's Training Center Survey

In past Annual Reports, this survey was conducted by NCFTC personnel on a weekly and monthly basis to provide early detection in the event any off-site LFG migration occurred at NCFTC facilities. The monitoring included the weekly sampling of the crawl space and sleeve located in the pump house and the monthly sampling of all other points located at the NCFTC. This survey has been discontinued by the County.

### 3.3.2 Adjacent Building Structures and Incinerator Complex Survey

As recommended in the 1991 Annual Report (LKB, June 1992), monthly monitoring was conducted by TOB personnel at building structures immediately adjacent to the OBSWDC and on-site building structures. Monitoring was initiated to provide early warning in the event any off-site LFG migration occurred at adjacent buildings and businesses or combustible gas concentrations were detected at the former incinerator complexes, the compacter-baler facility, the groundwater remediation facility and scalehouse.

Combustible gas readings for the Adjacent Building Structures and Incinerator Complex Survey (See Table 3) were measured by TOB personnel at monthly intervals from points located in the interior and exterior of 15 building structures (see Figures 4, 5, 6 and 7). The readings were taken from sensors, drains, well pits and loading docks located in and around these structures. Readings measured by TOB personnel in the survey were then sent to LKB for analysis and evaluation. In

TABLE 3
1992 MONTHLY MONITORING SURVEY
ADJACENT BUILDING STRUCTURES AND INCINERATOR COMPLEX SURVEY
TOWN OF OYSTER BAY
PERCENT COMBUSTIBLE GAS

| Weather | Sunny | Cloudy | Sunny | Cloudy | Sunny | Sunny | Sunny | Cloudy | Pt.Cloudy | Sunny | Rain | Rain |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temp. | 27° | 40° | 31° | 42° | 62° | 65° | 62° | 70° | 60° | 40° | 50° | 40° |
| Bar. Pr. | 30.36 ↔ | 29.88 ↑ | 30.16 ↑ | 29.86 ↓ | 30.26 ↔ | 29.86 ↑ | 29.92 ↑ | 30.00 ↔ | 29.96 ↔ | 29.98 ↓ | 29.99 ↑ | 30.45 ↓ |
| Date / Location * | Jan 28 | Feb 20 | Mar 18 | Apr 27 | May 29 | June 26 | Jul 29 | Aug 27 | Sep 29 | Oct 29 | Nov 27 | Dec 29 |
| A-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| B-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| B-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C-3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| C-4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| D-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| D-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E-3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E-4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E-5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| F-5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| G-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| G-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| I-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| J-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| J-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| K-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| K-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| M-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| N-16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P-1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P-2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P-3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P-4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P-4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P-5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P-6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| P-7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Notes:

*: All sampling locations presented in Table 3 are shown in Figures 4, 5, 6 and 7.

TABLE 4
1992 MONTHLY MONITORING SURVEY
SENIOR CITIZEN HOUSING SURVEY
TOWN OF OYSTER BAY
PERCENT COMBUSTIBLE GAS

| Weather | Sunny | Cloudy | Sunny | Cloudy | Sunny | Sunny | Sunny | Cloudy | Pt.Cloudy | Sunny | Rain | Rain |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Temp. | 27° | 40° | 31° | 42° | 62° | 65° | 62° | 70° | 60° | 40° | 50° | 40° |
| Bar. Pr. | 30.36↔ | 29.88↑ | 30.16↑ | 29.86↓ | 30.26↔ | 29.86↑ | 29.92↑ | 30.00↔ | 29.96↔ | 29.98↓ | 29.99↑ | 30.45↓ |
| Date | Jan 28 | Feb 20 | Mar 18 | Apr 27 | May 29 | June 26 | Jul 29 | Aug 27 | Sep 29 | Oct 29 | Nov 27 | Dec 29 |
| Location * | | | | | | | | | | | | |
| 103A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 103B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 106A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 106B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 107A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 107B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 108A | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 108B | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 108C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 108D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

Notes:

*: All sampling locations presented in Table 4 are shown in Figure 8.

this year's survey, zero percent combustible gas concentrations were measured at all sampling locations.

#### 3.3.3 Nassau County Campground Survey

The Nassau County Department of Parks and Recreation Battle Row Campground (The Campground), located on the western side of Claremont Road, was monitored for possible LFG migration on April 16, 1992 by LKB personnel. The survey consisted of sampling points (3/4" bar holes punched approximately 30 inches deep) parallel to the western boundary bordering Claremont Road. All sampling locations monitored indicated zero percent combustible gas.

#### 3.3.4 Senior Citizen Housing Survey

The Senior Citizen Housing complex is located west of the OBSWDC bounded by the property boundary of the OBSWDC, Round Swamp Road and Battle Row. Monthly combustible gas readings were measured by TOB personnel from points located in the interior and exterior of five (5) building structures located immediately adjacent to the OBSWDC. The readings were taken from drains and the ambient air. All sampling locations monitored indicated zero percent combustible gas. All data pertaining to these facilities are compiled in Table 4.

### 3.4 Phase 1 Gas Control and Recovery System

The Phase 1 Gas Control and Recovery System was authorized by the Town in compliance with 6 NYCRR Part 360, as a result of the lateral migration of LFG at the southeastern portion of the OBSWDC (for additional background information, see Section 1.4).

The initial venting system design consisted of four basic components: vents, header, blower and a test flare burner. Seven vents are located along the southeast section of the OBSWDC contiguous to the NCFTC. Six of these vents (LGV-1 thru LGV-6) are located adjacent and parallel to the northern property boundary of the NCFTC. The seventh vent (TGV-1) is situated perpendicular to the line of the other vents and approximately 115 feet north of the NCFTC into the landfill. The general arrangement of this system is presented in Figure 9.

As indicated in the migration contour developed by LKB based on our monitoring results, the Phase 1 System appears to have prevented any major lateral migration of landfill gas onto NCFTC property, providing suitable protection for the NCFTC.

### 3.5 Phase 2 Gas Control System

As a result of off-site gas migration occurring across Winding Road along the eastern portion of the OBSWDC, the Town authorized the design and construction of the Phase 2 Gas Control System (for additional background information, see Section 1.4).

The Phase 2 System is an extension of the then existing Phase 1 System, located along the eastern edge of the OBSWDC, adjacent to Winding Road (Figure 9). Improvements were incorporated into the design of the Phase 2 System, based on the evaluation of the Phase 1 System operation, and included an improved condensate collection system, and a more rigid header support system.

The Phase 2 System consists of seven vents (LGV-8 thru LGV-14) installed approximately 250 feet apart extending north along Winding Road and terminating near Recharge Basin No. 2. As part of the overall Phase 2 design, an additional vent (LGV-7) was installed about 300 feet south of LGV-5 to guard against the possible off-site migration of landfill gas onto the NCFTC from the Phase I landfill.

As indicated in the the migration contour developed by LKB, the Phase 2 System has obviated the lateral migration of LFG at building structures along Winding Road, thereby providing suitable protection for businesses located in this area. As noted in last year's report, Energy Tactics abandoned one of their gas header lines due to the low quality of the gas and condensate problems. The abandoned line is still tied into the Town's existing Phase 1 and 2 Gas Control System at TGV-1 and LGV-12, respectively.

### 3.6 Phase 3 Gas Control System

Results of past site monitoring data obtained between 1982 and 1986 have indicated that off-site gas migration had extended beyond the OBSWDC property boundary at the northwestern portion of the site. As a result of this off-site LFG migration, the Town authorized the design and construction of the Phase 3 Gas Control System (for additional background information, see Section 1.4).

The Phase 3 System is a further extension of the then existing Phase 1 and Phase 2 Systems and consists of eight vents (LGV-15 thru LGV-22) located at the toe of slope of the landfill along the northwestern and western portion of the site. This system incorporated the basic design elements and improvements developed in the previous system designs.

As indicated in the migration contour developed by LKB (Drawing No. 1), the Phase 3 System has prevented lateral migration of LFG into building structures located on Claremont Road, thereby providing suitable protection for businesses located in this area.

### 3.7 Reinstallation of the Above-ground Phase 3 Gas Control System Header

As part of the Remedial Action Plan, the Town was required to cap all existing uncapped portions of the Landfill. Final design plans for the landfill toe in the northwestern portion of the site necessitated the temporary removal of a portion of the existing above-ground Phase 3 Gas Control System header and the installation of a buried header.

In January 1993, capping operations at the landfill were completed. The Town deactivated the buried header and reinstalled the aboveground header system which continues to obviate the migration of landfill gas in this portion of the site.

## SECTION 4

## CONCLUSIONS

### 4.1 Landfill Gas Migration

#### 4.1.1 Site Survey

This year's annual zero migration line site survey data, obtained by LKB personnel between March 31, 1992 and April 29, 1992, indicated that the zero percent combustible gas migration contour (Drawing No. 1) remained stable as compared to the last two (2) years surveys, except for approximately 1,050 lineal feet of contour in the northwest portion of the OBSWDC. This portion of the contour has shifted to the west as a result of the completion of the landfill cap and the subsequent monitoring at the new toe of slope in this area.

The following conclusions are based on the site survey data obtained in this year's annual site survey:

- In the past several years of site monitoring, (between 1982 and 1986), maximum landfill gas migration was occurring in the northwestern portion of the OBSWDC, contiguous to the Key Way Concrete Supply Corp. Plant. As can be seen from the results of this year's and the past two year's Annual Site Survey's (Drawing No. 1), the zero percent combustible gas contours remain confined to areas located within the OBSWDC property boundary. These results are directly attributable to the successful operation of the Phase 3 Gas Control System and as such has thereby prevented the lateral migration of LFG

  As noted above, a portion of this year's zero percent combustible gas migration contour in the vicinity of the Phase II pit area has been plotted approximately 200 feet to the west of the contours obtained in the 1990 and 1991 zero percent combustible gas migration surveys. This shift to the west as compared to the previous surveys can be attributed to the fact that monitoring conducted as part of this year's sampling was taken along the new toe of slope of the landfill which resulted from the completion of the landfill capping project in this area.

- Both the southern (contiguous to the NCFTC) and eastern portions of the OBSWDC, which in the past experienced off-site migration of landfill gas, continue to show that the zero percent combustible gas contour is confined to areas located within the property boundaries of the OBSWDC. Again, these results are due to the successful operation of the Phase 1 Gas Control System, which continues to protect the NCFTC facilities from the lateral migration of landfill gas and the Phase 2 System, which has obviated landfill gas migration along Winding Road.

- All other sampling locations monitored in this year's annual site survey (specifically the northern and southwestern portions of the OBSWDC), continue to show that the zero percent combustible gas migration contour has remained stable and within the OBSWDC property boundaries.

#### 4.1.2 Monthly Monitoring Survey

Data obtained in this year's monthly monitoring survey (January to December 1992) have supported data provided in previous surveys, specifically the 1991 Annual Report (LKB, June 1992), with the exception of results obtained by Town personnel at sampling locations herein described.

The following conclusions for the results obtained in this year's monthly monitoring survey are presented below:

- Varying combustible gas concentrations were measured by TOB personnel at Nassau County monitoring well W-17, located at the Nassau County Fireman's Training Center (Table 2). As noted in Section 2.3, occurences of combustible gas readings within the NCFTC have been well defined over the course of five years of sampling and a joint betterment agreement has been signed between the County and Town wherein both parties will share in upgrading the Town's facilities. As with all other monitoring, should conditions warrant a more frequent sampling schedule, the Town would immediately implement a modified schedule.

- At sampling locations M-40, M-41, MW-5 Lower, MW-8 Upper, MW-10 Upper, and MW-11 Upper and Lower, the varying high combustible gas readings were anticipated since these probes are located on-site and therefore are expected to yield some landfill gases.

- Negligible and/or zero percent combustible gas concentrations were measured by Town personnel at all the other sampling locations presented in this year's monthly monitoring program.

All sampling locations, percent combustible gas concentrations and relevant field data are summarized in Tables 1 and 2.

## 4.2 Facilities Survey

### 4.2.1 Nassau County Fireman's Training Center Survey

As previously described, this survey has been discontinued by the County.

### 4.2.2 Adjacent Building Structures and Incinerator Complex Survey

In this year's Adjacent Building Structures and Incinerator Complex Survey (January to December 1992), zero percent combustible gas concentrations were measured by TOB personnel at all sampling locations.

### 4.2.3 Senior Citizen Housing Survey

In this year's Senior Citizen Housing Survey (January to December 1992), zero percent combusible gas concentrations were measured by TOB personnel at all sampling locations.

### 4.2.4 Nassau County Campground Survey

Landfill gas monitoring results for the Nassau County Campground indicated zero percent combustible gas concentrations in this year's survey.

## 4.3 Supplemental Gas Monitoring Program

### 4.3.1 Ambient Volatile Organic Compound (VOC) Air Sampling

As noted in Section 1.3, analytical data obtained from the one quarterly sampling performed in 1992 and previous testing indicated that for some parameters ambient air data taken upwind of the landfill showed higher VOC's than downwind data. Although there is no firm evidence that the landfill is contributing significantly to ambient VOC concentrations, the relatively small number of data presented in the report is statistically not sufficient to fully confirm that the landfill is not significantly contributing to ambient air concentrations of VOC's.

### 4.3.2 Subsurface VOC Gas Sampling

Subsurface gas sampling at a variety of locations surrounding the landfill yielded results which indicated that VOC's were present in the surrounding subsurface soil. These values in excess of respective AGC's are not technically in violation of the guidelines since the guidelines relate to ambient air concentrations and not soil gas. As noted earlier in this report, the observed soil gas concentrations do not appear to pose a significant risk because coincident ambient air measurements did not show an apparent correlation to the observed soil gas values.

### 4.3.3 Annual Thermal Oxidizer Stack Emission Sampling for VOC's.

As noted in Section 1.3, the results of the annual stack emission test at the thermal oxidizer indicated that VOC emissions were all well below the acceptable AGC's as stipulated by the NYSDEC.

### 4.3.4 Pressure Readings

As noted in Section 1.3, the results of one quarterly pressure sampling indicated that all pressure probes sampled were zero or negative pressure. Again as previously noted, the occurrence of zero or negative pressure as the sampling probes indicates the effectiveness of the Town's landfill gas control system and further supports data presented herein which shows the line of zero methane gas migration contained within the property boundaries of the OBSWDC.

Appended herewith are the Ambient Air Quality and Soil Gas Quality Survey's - First Quarter Report, Second Year of Monitoring (Appendix C) and the Annual Emission Test Report - Landfill Gas Thermal Oxidizer (Appendix D) which provide the sampling protocols and investigation methodologies for air, soil, gas and stack emissions as well as the sample collection, sample handling, analytical procedures applied for these programs and the sample results.

## 4.4 Monitoring Program Conclusions

In conclusion, this year's monitoring programs at the OBSWDC support efforts previously completed by the Town indicating the abatement of landfill gas migration by the Town's landfill gas control systems. These monitoring programs (Annual Site Survey, Monthly Monitoring Survey, Nassau County Campground Monitoring, Adjacent Building Structures Incinerator Complex Survey and Senior Citizen Housing Survey) were successfully conducted and completed, yielding valuable monitoring data used to aid in the early detection of LFG migration.

If, in the future, landfill gas migration is detected and located, remedial measures, design modifications and/or expansion of existing landfill gas control and recovery systems can be developed to assure that no hazards to health and safety are present in the vicinity of the OBSWDC.

# SECTION 5

# RECOMMENDATIONS

## 5.1 General

Based on the conclusions set forth in this report, the consultants recommend that the Town implement the additions and/or modifications outlined in Sections 5.2 through 5.6 inclusive. These programs represent a continuation of programs developed in previous reports, specifically the Comprehensive Land Use and Operations Plan, and the 1986 Annual Report Summarizing the Status of Landfill Gas Monitoring Programs and the Establishment of the Zero Percent Gas Migration Limitation at the Old Bethpage Landfill (LKB, April 1987), and are an integral part of the Final Consent Decree and the regulations governing the operation of the OBSWDC.

In addition to regulatory compliance, these programs provide the Town with essential LFG data and should be continued through 1993. The consultants further recommend that the Town submit this report and the programs outlined in the following sections to NYSDEC, NYSDOL, NCDH and NCFTC for their information and files.

## 5.2 Monitoring Programs

The monitoring programs outlined in this report consist of a modification of the monitoring schedule set forth in the the 1991 Annual Report (LKB, June 1992) and we recommend that the Town implement this modified schedule for it's 1993 monitoring. Refer to Appendix A for details of these programs.

## 5.3 Presence of Combustible Gas at the Nassau County Fireman's Training Center

The presence of combustible gas at the NCFTC prompted the Town to participate in several investigative and monitoring programs at the NCFTC as well as areas adjacent to the NCFTC and OBSWDC grounds. The programs included the installation and sampling of twelve (12) cluster wells located along the western property boundary of the NCFTC, sampling of monitoring probes located within the NCFTC and an investigation of the operation and performance of the Town's Gas Control System.

In 1992, the County and Town signed a betterment agreement wherein both parties will jointly share in upgrading the Town's facilities in the areas of joint concern. These improvements provided for the installation of a skid mounted blower, a water separator package and three (3) landfill gas vents in the vicinity of the common border of the NCFTC/OBSWDC. The construction contract for these improvements was let in October, 1992. Three new landfill gas vents (LGV-5A, LGV-5B and LGV-7A) were installed in November, 1992. The blower station improvements will be operable in early 1993.

As noted in Section 1.4 of this Report, the County and Town have concluded that, the gas control facilities currently contemplated will control the potential for gas migration along the common border of the NCFTC/OBSWDC. With the completion of work currently under consideration by the County, all subsurface landfill gas along the common border of the NCFTC/OBSWDC should be effectively under control.

## 5.4 Gas Extraction System Condensate Discharge

The Town has been permitted by the Nassau County Department of Public Works to discharge condensate from the gas extraction system into the Nassau County Sewer System. This connection discharges condensate from the Phase 1 and 2 Gas Control Systems and some carry over of condensate mist from the Phase 3 Gas Control System through a bed of lime chips prior to discharge. Most condensate generated by the Phase 3 Gas Control System is discharged to leachate collection well 'A' and ultimately pumped to and treated at the Town's Leachate Treatment Plant, prior to discharge to the Nassau County Sewer System.

### 5.5 Inspection and Maintenance of Existing Extraction Wells

LKB has recommended that the Town periodically inspect all the existing extraction wells of the Town's Gas Control System for the presence of siltation and/or blockage. Siltation of the extraction wells or the presence of biological growth could lead to a loss of control efficiency around each well by blinding the well screens. If siltation of the wells or biological growth is observed, the Town will take all necessary steps (air/water scouring) to remediate and restore wells to their original operating conditions. The Town has previously cleaned the landfill gas wells along the NCFTC/OBSWDC property line.

### 5.6 Quarterly Supplemental Sampling

As part of the "RAP", which detailed the actions to be undertaken by the Town in compliance with the Final Consent Decree, the Town is required to supplement its current gas monitoring activities. During 1991, the final quarterly round of thermal oxidizer emissions sampling were completed and the results were submitted to the NYSDEC for review. Under the Consent Decree, annual sampling of thermal oxidizer emissions began in 1992, and will continue annually thereafter. The third and fourth rounds of ambient air and subsurface gas sampling were completed in 1991, and those results were also submitted to the NYSDEC for review. After evaluating the data gathered during the four rounds of data collection, the Town proceeded with the second year of testing in 1992.

# APPENDIX A

## RECOMMENDED MONITORING SCHEDULE FOR 1993

| Sample Points | Frequency of Monitoring | Monitoring Performed by |
|---|---|---|
| Monthly Monitoring Survey | Monthly | TOB personnel |
| Nassau County Fireman's Training Center Monitoring | Monthly | TOB personnel |
| Adjacent Building Structures and Incinerator Complex Survey | Monthly | TOB personnel |
| Senior Citizen Housing Survey | Monthly | TOB personnel |
| Supplemental Gas Monitoring Program | Quarterly | LKB personnel |
| Ambient VOC Air Sampling* | Quarterly | LKB personnel |
| Subsurface VOC Gas Sampling* | Quarterly | LKB personnel |
| Thermal Oxidizer Emissions Sampling for VOC's ** | Annually | LKB personnel |
| Pressure Readings* | Quarterly | LKB personnel |
| Zero Migration Limits | Annually | LKB personnel |
| Nassau County Campground Survey | Annually | LKB personnel |

**NOTES:**

* This sampling will be performed on a quarterly basis unless permission is received by the NYSDOL to perform this monitoring on an annual basis.

** Upon completion of the initial year of quarterly sampling (February 1991), thermal oxidizer emissions sampling for VOC's was conducted annually. The oxidizer temperatures, however, are monitored on a continuous basis. Note that the Consent Decree requires monthly temperature monitoring.

## APPENDIX B

## IDENTIFICATION OF MONITORING BUILDINGS ADJACENT TO OBSWDC

| Identification Point | Identification Title | Building Location |
|---|---|---|
| A | Park Riding Stables | 499 Winding Road |
| B | Associated Rigging and Hauling Action Crane Company | 459 Winding Road |
| C | Mr. Bar-B-Q, Inc. Keromate | 455 Winding Road |
| D | P & P Recycling | 311 Winding Road |
| E | G & S Investors | 303 Winding Road |
| F | Aluminum Louver Company | 310 Winding Road |
| G | New Dimensions | 161 Bethpage-Sweethollow Road |
| I | Briden Construction | 90 Battle Row |
| J | Key Way Concrete Supply Corp. | 100 Battle Road |
| K | Scalehouse | OBSWDC |
| L | Incinerator No. 2 | OBSWDC |
| M | Compactor/Baler Building | OBSWDC |
| N | Incinerator No. 1 | OBSWDC |
| P | Groundwater Treatment Facility | OBSWDC |

1992 ANNUAL REPORT

# APPENDIX C
# AMBIENT AIR QUALITY SURVEY AND SOIL GAS QUALITY SURVEY

(SECOND YEAR OF MONITORING,
FIRST QUARTER REPORT)

MAY 1993

OLD BETHPAGE LANDFILL
OYSTER BAY SOLID WASTE DISPOSAL COMPLEX
AMBIENT AIR QUALITY SURVEY
AND
SOIL GAS QUALITY SURVEY

Second Year of Monitoring

First Quarter Report

Prepared for:

Town of Oyster Bay
Department of Public Works
Syosset, New York

Prepared by:

RTP Environmental Associates, Inc.
400 Post Avenue
Westbury, New York

MARCH 1993

1stQTR-3/23/93

OLD BETHPAGE LANDFILL
OYSTER BAY SOLID WASTE DISPOSAL COMPLEX

AMBIENT AIR QUALITY SURVEY AND SOIL GAS QUALITY SURVEY

SECOND YEAR OF MONITORING

FIRST QUARTER REPORT

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AMBIENT AIR QUALITY SURVEY AND SOIL GAS QUALITY SURVEY

SECOND YEAR OF MONITORING

FIRST QUARTER REPORT

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## 1.0 INTRODUCTION

RTP Environmental Associates, Inc. (RTP) was contracted by the Town of Oyster Bay through their Consultant, Lockwood Kessler & Bartlett, Inc. (LKB), to perform the sampling and analysis of ambient air and soil gases in the areas at and surrounding the Old Bethpage Landfill at the Oyster Bay Solid Waste Disposal Complex. The general scope of the program was defined in the Order on Consent which is presented in Appendix A. Since the Consent Decree was not explicit as to the specific methodology and testing protocols to be followed, RTP, in conjunction with the Town, LKB and analytical laboratories, developed a complete protocol and analysis strategy for meeting the general requirements stipulated by the Decree.

As stipulated in the Consent Decree, the ambient air quality and soil gas quality were to be monitored at several positions around the landfill. The samples were to be analyzed using approved protocols and the results were to be tabulated. Four sampling events were conducted during the initial year of the program and four events are scheduled for the second year of monitoring.

This report contains the results of the first quarter sampling effort of the second year of monitoring (second year, first quarter sampling event). This event was conducted on October 26 and 27, 1992. Sections 2.0 and 3.0 of the report contain the sampling protocol and investigation methodology for air and soil gas including sample collection, sample handling and analytical procedures applied for this program. Section 4.0 provides a discussion of results. Section 5 of this report contains the soil gas pressure sampling protocols and test results for this quarter.

## 2.0 METHODOLOGY AND PROTOCOLS

### 2.1 PROGRAM DEFINITION

In conformance with the RAP Attachment 2 of the Consent Decree (83 CIV 5357), as shown in Appendix A, the Town of Oyster Bay initiated an investigation of the ambient air quality and soil gas quality in the vicinity of the Old Bethpage Landfill. This report addresses four of the components listed in the RAP: (1) ambient air sampling; (2) 30" deep subsurface gas sampling; (3) subsurface gas sampling at various depths; and (4) soil gas pressure readings.

The objective of the air and soil gas portions of the program is to examine the ambient air concentration of trace volatile organic compounds (VOCs) in the vicinity of the Old Bethpage Landfill. During the second year first quarter sampling event, four ambient air samples were collected over a 24-hour period at three locations. Short-term (ten minute) subsurface soil gas grab samples were collected at the fifteen locations specified in the Consent Decree. Soil gas pressure readings were taken at three locations to assist in monitoring the effectiveness of the landfill gas collection system.

The air and soil gas sampling procedures follow those developed during the first year of sampling. The program also involved the collection of meteorological parameters from atop the landfill and at the upwind ambient air sampling location. This data was used to specifically define the micrometeorological conditions existing during the ambient air and subsurface soil gas sampling events as well as during the soil gas pressure measurement period.

## 2.2 GAS SAMPLING

### 2.2.1 General Scope

As required by the RAP Attachment 2, ambient air samples are to be collected over a 24-hour period at three locations around the landfill: (1) along Winding Road to the east and southeast of the landfill; (2) to the west of the landfill along Round Swamp Road; and (3) to the north of the landfill. The RAP also states that samples at the above three locations should be collected quarterly during the initial year of the program. As mentioned earlier, sampling will continue on a quarterly basis for the second year monitoring program. Samples are to be analyzed for volatile organic compounds.

The sample collection program was modified as discussed in the first year reports. Changes were made the ambient air sampling scope stated in the RAP to account for site geometry. The selected ambient air sampling locations for this quarter are shown in Figure 2.1. The 24-hour ambient air samples were taken at locations A1 and A4 and two 24-hour samples were taken at location A2/A3 for a total of four 24-hour ambient air samples. The reason for collecting two samples at a single site (A2/A3) was to provide two flow ranges. The first round of sampling identified a considerable range in ambient concentrations of various VOCs. Therefore, the two ranges of sample volumes were necessary to avoid mass loading limits on the samples and to

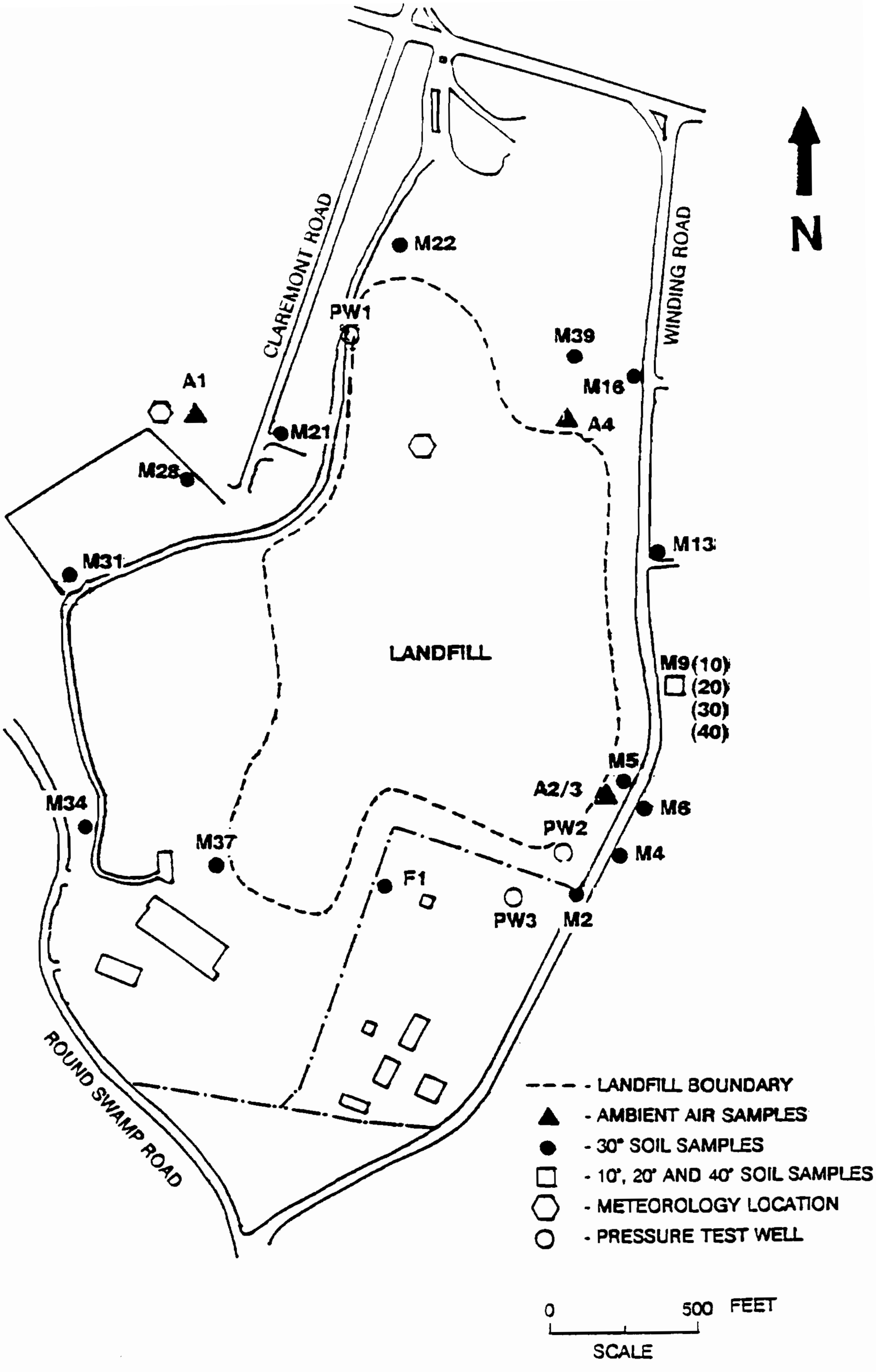


FIGURE 2.1: AMBIENT AIR AND SOIL MONITORING SITES AT OBSWDC

achieve acceptable analytical sensitivity for the target compound list.

The RAP requires the collection and analysis of samples from fourteen (14) 30" deep wells at different locations surrounding the landfill on a quarterly basis during the initial year of the program. Again, the second year monitoring program will consist of quarterly soil gas sample collection. In this second year first quarterly sampling event, all 30" wells listed in the Consent Decree were sampled. These included well locations M2, M4, M5, M6, M13, M16, M21, M22, M28, M31, M34, M37, M39 and F1 as identified in Figure 2.1. The sampling methodology used in the initial sampling event was also utilized in this case.

The third component of the RAP requires subsurface soil gas samples to be collected from ten (10), twenty (20), thirty (30), and forty (40) foot depths at location M9 as shown in Figure 2.1. Again, sampling was required on a quarterly basis during the initial year of the program. The second year monitoring program will include quarterly sampling at well M9 at all four depths.

As in the initial year of sampling, the sampling procedure being applied was the modified VOST method. A modified VOST approach was decided upon for several reasons:

- o Standard absorbent traps for ambient air sampling may miss several compounds because of the volatility of many organics at ambient temperatures. By cooling the absorbent traps to less than 68°F, the modified method would likely allow the traps to capture compounds that might normally go undetected.

- o Using a VOST trap series would provide data directly compatible with the thermal oxidizer tests being performed as part of the Consent Decree.

- o Since ambient air concentrations of VOCs are likely to be very low in the area surrounding the landfill, a method that would allow for the collection of large volumes of gas had to be developed.

- o Large volumes of ambient air were necessary because of the analytical limitations posed by standard gas chromatograph - mass spectrographic (GC/MS) methods.

- Evacuated canister methods were reviewed and deemed unacceptable because of low total volume capacity and potential leaks and contamination.

- The VOST series traps are applicable for both ambient air and soil gas monitoring and, the interference problems associated with sample bags and glass bulb methods were deemed unacceptable and had to be avoided.

A summary of the volatile organic compounds that could be evaluated by using the above methodology is presented in Table 2.1 along with corresponding New York State Department of Environmental Conservation (NYSDEC) ambient air guidelines. This is the target compound list for the second year of monitoring and is consistent with the VOC constituents being evaluated in the thermal oxidizer testing portion of the Consent Decree.

### 2.2.2 Modified VOST Sampler

The Volatile Organic Sampling Train (VOST) is one of three EPA methods identified to collect VOCs from stacks. A schematic diagram of the principal components of the standard VOST is shown in Figure 2.2. The VOST consists of a quartz or glass lined probe with a glass wool particulate plug, an isolation valve, a water cooled gas condenser with a thermocouple placed at the outlet to monitor gas stream temperature, a sorbent cartridge containing Tenax, an empty impinger for condensate removal, a second water cooled glass condenser, a second sorbent cartridge containing Tenax and petroleum based charcoal (3:1 by volume; approximately 1 gram of each), a silica gel drying tube, a calibrated rotameter, a sampling pump and a dry gas meter.

The standard VOST is not designed for portable ambient air monitoring work. It is designed to extract and concentrate volatile organic compounds with boiling points less than or equal to 100° centigrade from stack gas effluents. The major difficulties with using a standard VOST in the field for ambient air quality work are the power requirements, setup and assembly problems and the breakage of glassware.

RTP modified the EPA standard VOST unit to make it portable and to account for air flow volumes necessary to achieve the analytical sensitivity required in both ambient air and subsurface soil gas sampling programs that are required by the Consent Decree. Figure 2.3 shows the RTP modified VOST. The key components of the modified VOST are: precalibrated

**TABLE 2.1**

OLD BETHPAGE LANDFILL
OYSTER BAY SOLID WASTE DISPOSAL COMPLEX

**PROGRAM TARGET COMPOUND LIST WITH**
**NYSDEC AMBIENT AIR GUIDELINES**

| VOC COMPOUND NAME | TOXICITY | CURRENT SGC (ug/m3) | | CURRENT AGC (ug/m3) | | FORMER AGC (ug/m3) |
|---|---|---|---|---|---|---|
| Acetone | L | 140,000 | (r) | 14,000 | (R) | 35,600 |
| Benzene | H | 30 | (p) | 0.12 | (E,U) | 100 |
| Bromodichloromethane | H | | | 0.02 | (D) | 0.03* |
| Bromoform | M | 1,200 | (t) | 12 | (T) | 11.9* |
| Bromomethane | | | | | | |
| 2-Butanone | M | 140,000 | (t) | 300 | (E) | 1,967 |
| Carbon Disulfide | M | 710 | (r) | 7 | (D) | 100 |
| Carbon Tetrachloride | H | 1,300 | (r) | 0.07 | (E,U) | 100 |
| Chlorobenzene | M | 11,000 | (p) | 20 | (E) | 1,170 |
| Chloroethane | L | 630,000 | (t) | 63,000 | (T) | 52,000 |
| Chloroform | M | 980 | (r) | 23 | (R) | 167 |
| Chloromethane | M | 22,000 | (d) | 770 | (D) | 2,100 |
| Dibromochloromethane | M | | | 0.1 | (D) | 0.03* |
| 1,2-Dichlorobenzene (o) | M | 30,000 | (t) | 200 | (E) | 1,000 |
| 1,3-Dichlorobenzene (m) | M | 30,000 | (a) | 200 | (A) | 714* |
| 1,4-Dichlorobenzene (p) | M* | 110,000* | | 700* | | |
| 1,1-Dichloroethane | L | 190,000 | (t) | 500 | (E) | 9,524* |
| 1,2-Dichloroethane | M | 950 | (r) | 0.039 | (E,U) | 0.2 |
| 1,1-Dichloroethene | H | 2,000 | (t) | 0.02 | (E,U) | 66.7 |
| trans-1,2-Dichloroethene | M | | | 360 | (D) | 360* |
| 1,2-Dichloropropane | M | 83,000 | (t) | 0.15 | (D) | 833* |
| cis-1,3-Dichloropropene | | | | | | |
| trans-1,3-Dichloropropene | | | | | | |
| Ethylbenzene | M | 100,000 | (t) | 1,000 | (T) | 1,450 |
| 2-Hexanone | | | | | | |
| 4-Methyl-2-Pentanone | M | 48,000 | (r) | 480 | (R) | 683 |
| Methylene Chloride | M | 41,000 | (t) | 27 | (D,U) | 1,170 |
| Styrene | M | 51,000 | (t) | 510 | (T) | 716 |
| 1,1,2,2-Tetrachloroethane | M | 1,600 | (t) | 0.02 | (E,U) | 23.2 |
| Tetrachloroethene | M | 81,000 | (t) | 0.075 | (D,U) | 1,120 |
| Toluene | L | 89,000 | (r) | 2,000 | (I) | 7,500 |
| 1,1,1-Trichloroethane | L | 450,000 | (t) | 1,000 | (E) | 38,000 |
| 1,1,2-Trichloroethane | M | 13,000 | (t) | 0.06 | (E,U) | 150 |
| Trichloroethene | M | 33,000 | (r) | 0.45 | (D,U) | 900 |
| Trichlorofluoromethane | L | 560,000 | (t) | 700 | (E) | |
| Vinyl Chloride | H | 1,300 | (t) | 0.02 | (E,U) | 0.4 |
| Xylenes (Total) | M | 100,000 | (t) | 300 | (I) | 1,450** |

**TABLE 2.1**
**Continued**

OLD BETHPAGE LANDFILL
OYSTER BAY SOLID WASTE DISPOSAL COMPLEX

**PROGRAM TARGET COMPOUND LIST WITH**
**NYSDEC AMBIENT AIR GUIDELINES**

| TENTATIVELY IDENTIFIED COMPOUNDS*** | TOXICITY | CURRENT SGC (ug/m3) | | CURRENT AGC (ug/m3) | | FORMER AGC (ug/m3) |
|---|---|---|---|---|---|---|
| Benzaldehyde | | | | | | |
| 2-Chloroethyl Vinyl Ether | | | | | | |
| Freon 13 | L | 43,000 | (a) | 530 | (A) | 133,333* |
| cis-1,2-Dichloroethene | M | 190,000 | (a) | 1,900 | (A) | 1,880* |
| Vinyl Acetate | | | | | | |

FOOTNOTES:
SGC - Short-term guideline concentration.
AGC - Annual guideline concentration (current as of June 1991, former as of 1986, 9/89 Edition).
*Proposed Value.
**1450 total for ortho and para xylenes and 1450 total for meta xylene.
***Tentatively Identified Compound (TIC) using EPA SW846 Method 8240. Six additional non-target compound GC/MS peaks with the largest analytical response were also targeted.
Toxicity - H for High; M for moderate; and L for low by NYSDEC.
(a) - SGC based on NYSDEC structure-activity analogy.
(d) - SGC derived by NYSDEC, Division of Air Resources, Bureau of Air Toxics, Toxics Assessment Section.
(p) - SGC derived from propsed ACGIH TLV-TWA (1990-1991).
(r) - SGC derived from NIOSH REL-TWA (1988).
(t) - SGC derived from ACGIH TLV-TWA (1990-1991).
(A) - AGC based on NYSDEC structure-activity analogy.
(D) - AGC derived from NYSDEC, Division of Air Resources, Bureau of Air Toxics, Toxics Assessment Section.
(E) - AGC based on derivation by USEPA.
(I) - AGC based on RFC developed by USEPA - Integrated Risk Information System (RIS), input pending.
(R) - AGC derived from NIOSH REL-TWA (1988).
(T) - AGC derived from ACGIH TLV-TWA (1990-1991).
(U) - AGC is the ambient air concentration which corresponds to an excess cancer risk of one in one million after lifetime exposure.

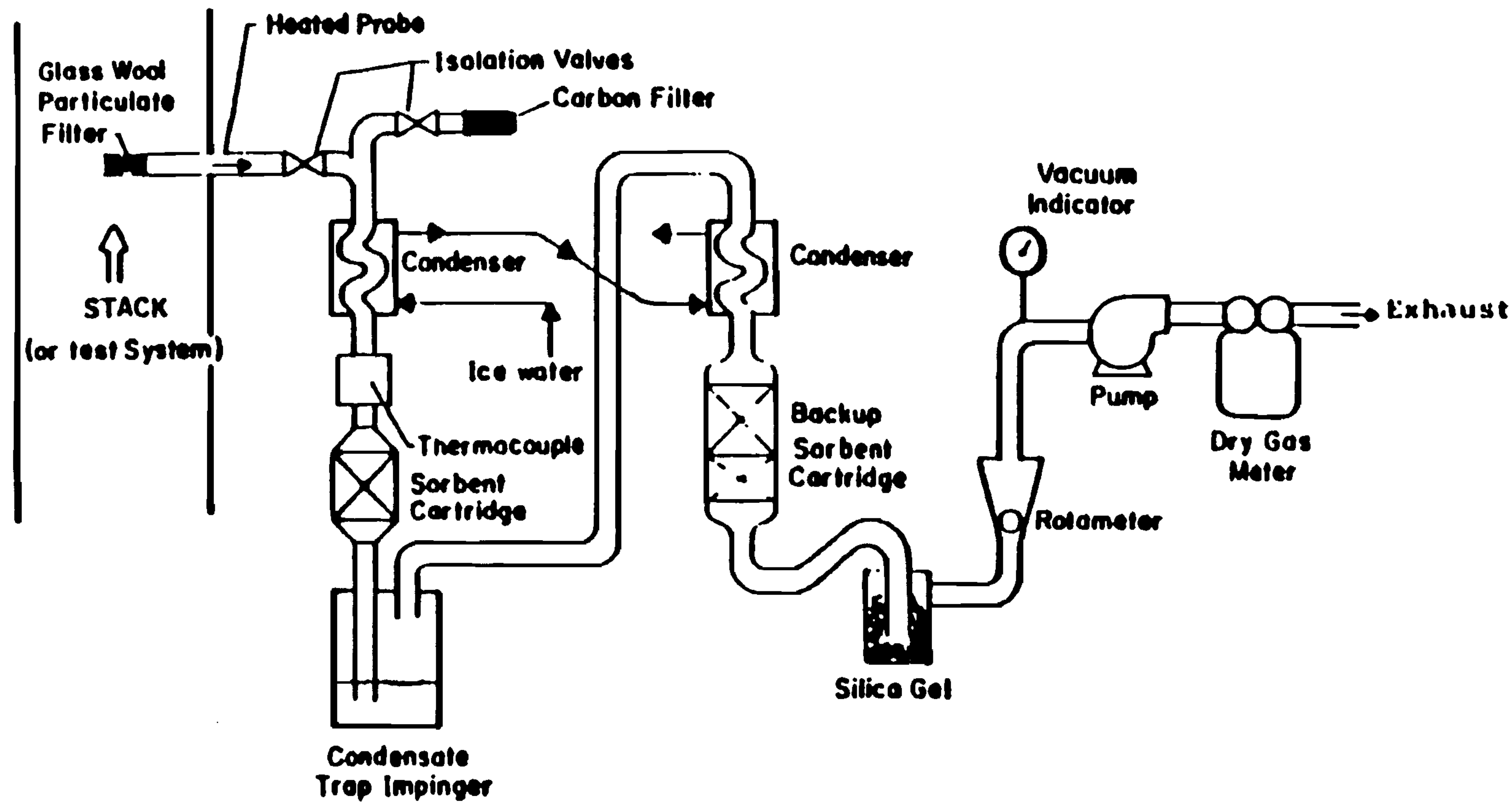


FIGURE 2.2: SCHEMATIC OF EPA REFERENCED VOLATILE ORGANIC SAMPLING TRAIN (VOST)

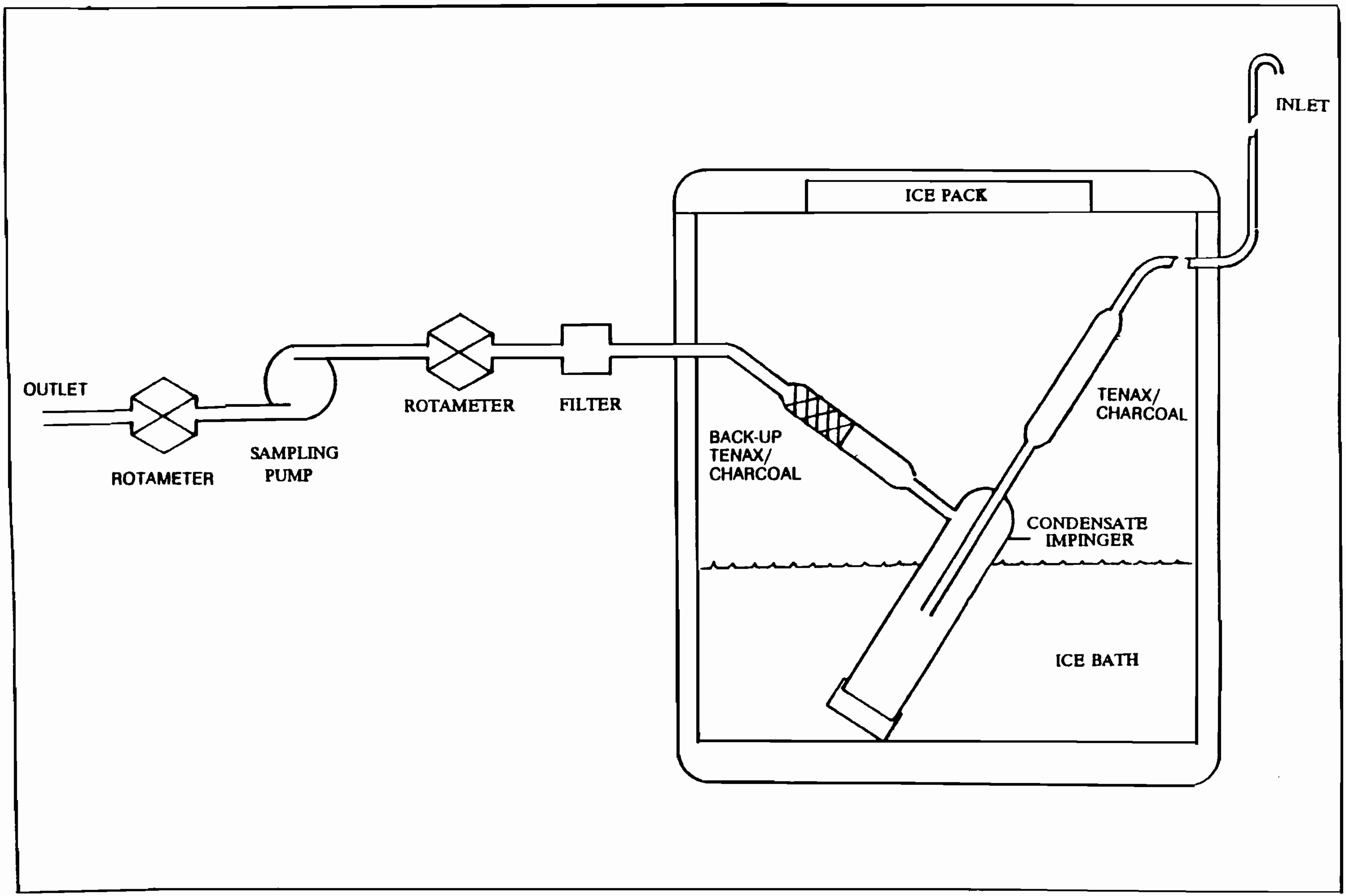


**FIGURE 2.3:** MODIFIED VOST SAMPLER

portable sampling pump, rotameter, a rechargeable GEL CEL battery pack, particulate filter, two pre-weighted VOST Tenax/Charcoal sorbent traps, condensate impinger, aluminum tube holder, ice bath and ice pack, sampling cane, and cooler enclosure. The VOST Tenax/Charcoal sorbent traps used in the modified sampling train are the same as those used in the VOST EPA referenced method. However, the SKC sampling pump and rotameter were used instead of the standard VOST flow controlled sampling pump and dry gas meter, and the ice bath, ice pack and condensate impinger were used instead of two condensers. Two Tenax/Charcoal traps were used in order to account for possible breakthrough in the high volume samples and were used throughout the program for method uniformity among all sources.

### 2.2.3 Sample Volume Selection

The selection of sample volume for both air and soil gas samples for this study was investigated. In general, the sample volume or sample size is limited by the analytical instrumentation being applied at the host laboratory and the period of sampling required in the Consent Decree. Since sample quantitation is based on nanogram concentrations of constituents, appropriate sample volumes were necessary to provide the desired analytical sensitivity.

In general, analytical instruments can detect between a few nanograms to thousands of nanograms of individual constituents in a sample. The analytical instrument's lower quantitation limit for this case was set between 20 and 240 nanograms. The upper quantitation limit (calibration limit) was nominally set at approximately 50 times the lower quantitation limit. Therefore, in order to provide the correct mass loading of constituents on the sample substrate, sample volumes were approximated based on Photovac Micro-Tip values as presented in Table 2.2. Since the Micro-Tip has a lower limit of detection at 0.1 ppm, it was not always possible to specify the exact sample volume required to consistently achieve the proper mass loading on each sampling tube. Therefore, to avoid missing compounds because of insufficient sample volume for ambient air samples, high volume (approximately 1000 liters) and low volume (approximately 100 liters) sample sizes were selected.

It was previously determined that a 10 liter sample volume would be appropriate for sampling shallow soil gas wells. Removing more than a 10 liter sample would have meant that ambient air from the surface would have been introduced into the well being sampled.

TABLE 2.2

OLD BETHPAGE LANDFILL
OYSTER BAY SOLID WASTE DISPOSAL COMPLEX

GENERAL RELATIONSHIP BETWEEN MICRO-TIP
READINGS AND SAMPLE VOLUME

| MICRO-TIP READINGS (ppm)* | SAMPLE VOLUME (liters) |
|---|---|
| <0.1 to 0.5 | 1,000 to 10 |
| 2 to 5 | 1 |
| 5 to 10 | 0.5 |
| 10 to 15 | 0.1 |
| 15 to 20 | 0.05 |
| >20 | 0.01 |

*Micro-Tip photoionization detector with 11.7 ev lamp.



LKBT22.xls

### 2.2.4 Other Sampling Equipment

The SKC sampling pump used in this study is a model MOD 224-PCXR7 universal exhaust pump. It automatically shuts down for low battery voltage and excess back pressure. The accuracy of the sampling pump is about +/- 5% of the set nominal flow rate.

The SKC sampling pump can be programmed to operate continuously and intermittently. Also, it can be used to collect different total sample volumes at different flow rates. The pump can be programmed to continuously draw samples at a desired flow rate over a preassigned time period. This capability is particularly important in the ambient air sampling event. It makes it possible to collect ambient air samples intermittently over a 24-hour total elapsed time period to give a 24-hour average VOC concentration as specified in the Consent Decree. The only factor that limits the overall sampling time would be the pump battery capacity which was expanded by using a larger capacity battery.

SKC electronic calibrator Model 712 is used before and after each sampling event to calibrate two (2) Supelco rotameters (one high flow (1.0 Lpm), one low flow (0.070 Lpm) to a desired nominal flow rate. It is also used prior to testing to set up a relationship between actual pump volume flow rates and their corresponding rotameter readings. Inconsistencies between both rotameters could reveal a pump leak. These calibration data together with the Supelco rotameter readings recorded during sampling, are then used after all monitoring events to establish the sample volumes collected during each test. SKC calibrator is a digital film flow meter consisting of a microprocessor and a sensitive bubble meter with two photo-sensor lines. The flow rate shown on the digital film flow meter is calculated by the microprocessor. The flow is based upon the bubble meter inner diameter and the elapsed time taken by a bubble passing between the two photo-sensor lines. The accuracy of this calibrator and the Supelco rotameters is around +/- 2%.

A Photovac Micro-Tip meter was also used during the monitoring program. It is a hand held instantaneously reading analyzer that measures the total concentration of all ionizable compounds (in ppm). It is to be used before and after each sampling event to measure total VOC concentration. Micro-Tip is used to verify and adjust, if necessary, the appropriate nominal pump flow rate for each ambient air and subsurface soil gas sample.

## 2.3 METEOROLOGICAL DATA

Ambient onsite meteorological data was collected during the ambient air quality and soil gas tests. Meteorological data provide information on ambient conditions occurring during the tests. The specific equipment used to measure and record onsite meteorological data is identified and presented in Appendix B.

The meteorological parameters of interest in this program are: wind speed, wind direction, temperature, relative humidity, turbulence, barometric pressure and precipitation. The meteorological equipment used included an 8 and 12 foot meteorological tower, each including a solid-state barometric pressure sensor, precipitation gauge, three-cup anemometer, counterbalanced wind vane coupled to a precision, low-torque potentiometer, temperature sensor and a fully programmable CR10 measurement data logger and control module. The pressure sensor and the CR10 data logger/controller was enclosed inside a portable instrument case. The remainder of the equipment was mounted on each meteorological tower. Appendix B provides a detailed description of the meteorological sampling and data processing protocols.

# 3.0 SAMPLING AND ANALYSIS

## 3.1 BACKGROUND

The program's scope of work for sampling and analysis of ambient air quality levels in the vicinity of the Old Bethpage Landfill was principally guided by the NYSDOL Consent Decree. As mentioned in Section 2.0, the EPA reference sampling mechanism was modified to account for site conditions and monitoring requirements. All locations specified in the Consent Order were sampled.

Analytical laboratory equipment provided concentration measurements based on mass loading of specific substrates within the sampling tubes. It was, therefore, important to determine how much pollutant mass was contained in each gaseous sample from each soil gas well and ambient air location. Historical data did not define what specific ambient levels were to be expected, therefore, a portable ambient air and soil gas monitor (Photovac Micro-Tip Total Hydrocarbon Analyzer) having detection ranges down to 0.1 ppm was used in this case to preliminarily define sample loadings.

## 3.2 AMBIENT AIR SAMPLING

The second year first quarterly 24-hour ambient air sampling event was conducted on October 26 and 27, 1992. Three locations at the Old Bethpage Landfill were selected as illustrated on Figure 2.1. At locations A1 and A4, high volume, 24-hour ambient air samples were collected using the modified VOST sampler. At locations A2 and A3, low volume and high volume 24-hour modified VOST samples were collected. The critical sampling parameters are summarized in Table 3.1.

The sampling trains were partially assembled according to the air sampling protocol presented in Appendix B prior to taking the four ambient air samplers to their respective field locations. The SKC sampling pumps were calibrated, battery packs were charged, both the pumps and battery packs were positioned and connected, aluminum tube holders were positioned, sampling canes were mounte2d onto the coolers and the inlets to the sampling ports were sealed. The VOST tubes were removed from their protective cases at the sampling sites and then the end caps and fittings were removed. The tubes were installed and the samplers were placed in their respective positions as shown in Figure 2.3. The sampler design for the tests has been described in Section 2.2.

The sampler for location A1 was positioned to the west of the landfill at the Battle Row Campground as shown in Figure 2.1. Sampler A4 was positioned on the north side of the landfill to the south of soil gas well M39. Samplers at both A1 and A4 were set to continuously collect at a 0.7 Lpm nominal flow rate over a 24-hour period. These settings would allow for the collection of two 1,000 liter samples at A1 and A4, respectively. The reason the pump was set at 0.7 Lpm was to place the pump at a sampling rate that was removed from the extreme ends of the pump's operating range which is 0.1 Lpm to 5.0 Lpm while at the same time, collecting a total air volume of approximately 1,000 liters over the 24-hour period. Samplers A-1 and A-4 began sampling at 1031 EDT and 0858 EDT on October 26, 1992 respectively.

Samplers A-2 and A-3 were set up southeast of the landfill. Sampler A-3 was set to continuously collect a 1,000 liter integrated sample at 0.7 lpm over the 24-hour period, the same set up as for Samplers A-1 and A-4. Sampler A-2 was set to collect a low volume sample. To achieve this, a sampling manifold was constructed with two (2) SKC single stage universal constant-flow controllers in parallel. A Supelco low flow rotameter was positioned in-line with one of the

**TABLE 3.1**

OLD BETHPAGE LANDFILL
OYSTER BAY SOLID WASTE DISPOSAL COMPLEX

**SUMMARY OF AMBIENT AIR SAMPLING**

| SITE ID* | SAMPLE ID | TESTING DATE | DURATION (minutes) | SAMPLING HEIGHT (inches) | NOMINAL FLOWRATE (l/min) | DESIRED QUANTITY (liter) | ACTUAL QUANTITY** (liter) |
|---|---|---|---|---|---|---|---|
| A-1 | 2-1A1 | 10/26-27/92 | 1,408 | 40 | 0.7 | 1,000 | 1,050 |
| A-2 | 2-1A2 | 10/26-27/92 | 1,421 | 40 | 0.7 | 1,000 | 1,020 |
| A-3 | 2-1A3 | 10/26-27/92 | 1,422 | 40 | 0.07 | 100 | 105 |
| A-4 | 2-1A4 | 10/26-27/92 | 1,440 | 40 | 0.7 | 1,000 | 1,060 |

**SUMMARY OF SUBSURFACE SOIL GAS SAMPLING**

| SITE ID* | SAMPLE ID | TESTING DATE | DURATION (minutes) | SAMPLING DEPTH (inches) | NOMINAL FLOWRATE (l/min) | DESIRED QUANTITY (liter) | ACTUAL QUANTITY** (liter) |
|---|---|---|---|---|---|---|---|
| F1 | 2-1F1 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.56 |
| M2 | 2-1M2 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.65 |
| M4 | 2-1M4 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.65 |
| M5 | 2-1M5 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.65 |
| M6 | 2-1M6 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.70 |
| M9 (10') | 2-1M9(10) | 10/26/92 | 10 | 10 feet | 1.0 | 10 | 8.71 |
| M9 (20') | 2-1M9(20) | 10/26/92 | 10 | 20 feet | 1.0 | 10 | 8.71 |
| M9 (30') | 2-1M9(30) | 10/26/92 | 10 | 30 feet | 1.0 | 10 | 8.71 |
| M9 (40') | 2-1M9(40) | 10/26/92 | 10 | 40 feet | 1.0 | 10 | 8.71 |
| M13 | 2-1M13 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.70 |
| M16 | 2-1M16 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.70 |
| M21 | 2-1M21 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.70 |
| M22 | 2-1M22 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.69 |
| M28 | 2-1M28 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.69 |
| M31 | 2-1M31 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.66 |
| M34 | 2-1M34 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.69 |
| M37 | 2-1M37 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.69 |
| M39 | 2-1M39 | 10/26/92 | 10 | 30 | 1.0 | 10 | 8.69 |

*See Figure 2.1 for ambient air and soil gas sampling locations.

A1: High volume ambient upwind sample collected at the Battle Row Campground.
A2: High volume ambient downwind sample collected 50 feet southwest of well M5.
A3: Low volume ambient downwind (A2 duplicate) sample collected 50 feet southwest of well M5.
A4: High volume ambient downwind sample collected 100 feet south of well M39.

**Corrected to ambient conditions

constant-flow controllers downstream of the sorbent trap prior to the SKC pump inlet. The remaining constant-flow controller was opened to atmosphere and connected in parallel with the other flow controller. The adjustment pod to the constant-flow controller connected to the sorbent traps was turned to register the desired 0.07 Lpm flow rate on the in-line rotameter. The remaining constant-flow controller was adjusted to maintain the total flow to the SKC sampling pump within the operating range mentioned earlier. This would allow for the continuous collection of an integrated 100 liter sample over the 24-hour sampling period. Samplers A-2 and A-3 both began sampling at 0945 EDT on October 26, 1992.

The ambient total VOC concentration was monitored at each site by a Photovac Micro-Tip. Ambient total VOC concentrations were measured to be 0.0 ppm at the initiation at all sampling sites except A4. The initial ambient total VOC concentration at A4 was 1.5 ppm. Based on the above ambient concentrations, flow rates were set at 0.7 Lpm for A1, A3 and A4 and 0.07 Lpm for A2. These rates would achieve the desired range in sample volumes necessary for analytical sensitivity requirements.

Periodic checks were made at the ambient air sampling locations. Pump operations were monitored and VOST train integrity, station flow rates and ice levels in the samplers were checked. In all, each sampler was checked eight to nine times during the 24-hour sampling period. Rotameter readings during these site checks were within established ranges. Sampling proceeded according to plan over the 24-hour sampling periods at all sites.

The final VOC ambient concentrations at all sites were 0.0 ppm except A1 (0.4 ppm) based on the Micro-Tip reading. Pump elapsed run time readings were recorded, VOST traps were removed, and the condensate (if available) was collected in the Tenax/Charcoal trap. All sorbent trap shipping tubes were labeled and shipped to the analytical laboratory as per the established protocol.

The analytical laboratory for this test was Research Triangle Laboratories (RTL). The laboratory received all sorbent traps in good condition. The laboratory analytical results along with the data observed during the sampling event will be discussed in Section 4.0. A more detailed chronology of the ambient air sampling event is presented in Appendix C. The RTL analytical report is provided in Appendix D. Field data forms and equipment calibrations are provided in Appendix E and F, respectively. Meteorological data is provided in Appendix G.

## 3.3 SOIL GAS SAMPLING

The soil gas sampling elements of the Consent Decree require soil gas samples to be extracted from several 30" deep subsurface gas wells and from 10', 20' 30' and 40' deep subsurface gas wells at M9. The decree does not specify the volume of sample, constituents to be analyzed, time period for collection, conditions for collection, analytical instrumentation, minimum level of detection and other parameters necessary to specifically define the nature of the tests and the applicability of the test results. Based on the other elements of the work scope in the Consent Decree, RAP Attachment 2, it was decided to follow the protocols and procedures outlined in Section 2.3 and presented in Appendix B for all soil gas samples.

The first step in the soil gas test was to assemble the sampling trains. The sampler design is equivalent to that used for the ambient air samples except for the following modifications. The sample probe was modified to include a 36" long, 1/4" diameter, stainless steel tube that was attached to the sampler inlet line in place of the sampling cane. Prior to use, the stainless steel sample probe tube was heated to purge any oils/VOCs attached to the stainless steel. After purging, the tubes were capped to prevent inadvertent exposure to trace VOCs. The sampler pump was calibrated and programmed for specific flow rates at each soil gas sampling point based on the total VOC concentrations observed in the well prior to removal of a soil gas sample. Total VOC well concentrations were monitored by the Photovac Micro-Tip.

Soil gas samples were collected at M2, M4, M5, M6, M13, M16, M21, M22, M28, M31, M34, M37, M39, F1 and M9 (10', 20', 30' and 40' depths) as shown on Figure 2.1 and as summarized in Table 3.1. All 30" soil gas wells were temporarily sealed with teflon tape, tygon tubing and a 1/4" open bore bulk head union with a brass screw on cap prior to the collection of the soil gas samples. M9 wells have individual shut off valves which were all closed prior to the sampling event. The general procedure of collecting a sample was as follows. The brass screw on cap was removed from the well. The stainless steel sampling probe attached to the Micro-Tip was inserted into the well to a depth of 26" and sealed from the atmosphere using a teflon screw on nut and ferrul. The Micro-Tip was turned on and operated for approximately 30 seconds to extract the stagnant well gases and total VOC well concentrations were monitored continuously. SKC pumps were used to extract stagnant gases from the deep wells. The duration of pump operation at the M9 cluster wells depended on the well depth of each soil gas probe. Since well gas concentrations were not exceptionally high, the sampling pumps during soil gas sample collection were set at a rate of 1.0 Lpm and run for a total of 10 minutes at each well site. This procedure resulted in approximately 10.0 liters of soil gas being drawn through the VOST traps at each well. At the end of the sample, the Micro-Tip was again used to record well concentrations. The VOST tubes were then removed from the train, labelled and packed for shipment to the laboratory. The lines and probe were purged by using sweep air cleaned by a Tenax/Charcoal tube for several minutes prior to sampling the next soil gas well.

A detailed chronology of the soil gas sampling is presented in Appendix C. The RTL analytical report is provided in Appendix D. Field data forms and equipment calibrations are provided in Appendix E and F, respectively. Meteorological data is provided in Appendix G.

### 3.4 ANALYTICAL LABORATORY PROCEDURES

Prepackaged clean VOST tubes were supplied by Research Triangle Laboratories (RTL) for use in this study. Upon arrival at RTP, the sampling tubes were refrigerated until their use in the field program.

RTL was forwarded a list of the VOCs that were initially identified as the target compound list for this monitoring program. RTL evaluated both Tenax and Tenax/Charcoal traps from each sample set as a single laboratory run. There did not appear to be a need for separating front half from back half for this test sequence because of limited concentrations measured by the Micro-Tip. The RTL report is presented in Appendix D. RTL did experience a fairly high concentrations of various compounds, predominantly benzene, toluene, tetrachloroethene and xylenes in the high volume VOST ambient air sample A1, A2 and A4. High levels of 1,1,1-trichloroethane were also observed in A1 and A4 and ethybenzene in A2. The three soil gas samples with the highest observed total VOC concentration (Micro-Tip reading), M6, M9(20') and M28, were split prior to analysis in order to minimize GC/MS detector saturation of targeted VOCs. Levels were found low enough to discontinue sample splitting thus maximizing analytical method sensitivity.

High levels of carbon dioxide had in a few cases obscured early eluting target compound peaks. To avoid this in future sampling events RTP will recommend to RTL a MS mass 44 scan delay. The mass 44 scan delay will allow for the analysis of all targeted compounds but may not allow for (semi-)quantitation of tentatively identified compounds with molecular weights less than or equal to 44. The laboratory report (Appendix D) provides a complete description of the analysis of samples. As a result of the scan delay, major data capture and confidence improvements for chloromethane, vinyl chloride, bromonethane, chloroethane and trichlorofluoromethane will be made. Target ketones (acetone, 2-butanone, 2-hexanone and 4-methyl-2-pentanone) will be tentatively identified when detected by using secondary ion matches at the expected retention time. Caution will be given with this ID procedure due to the lack of confirmation ion ratios available. Quantitation of the ketone levels detected would also be considered estimates due to calibrations using the primary ion versus the sample using, in some cases, its secondary ion for identification. Explanations will be provided in the second year, third quarter report as to the individual quantitation technique. It should be noted that any ion ratio quantitation made with a single ion integration is much more accurate than a total ion quantitation as specified by the procedure used to calculate tentatively identified compounds (TICs). Non targeted TICs below mass 45 may be missed. This procedure is deemed acceptable by RTP given the significance of the early eluting compounds versus targeted ketones relative to AGC values and observed first year concentrations.

## 4.0 DISCUSSION OF RESULTS

### 4.1 AMBIENT AIR CONCENTRATIONS

For the second year first quarter sampling event at the Old Bethpage Landfill, the ambient air concentrations at selected sites were monitored over a 24-hour period on October 26 and 27, 1992. The sites have been identified and the monitoring and analysis methods discussed in preceding sections of this report. Laboratory analytical results are translated into ambient air concentrations in this section.

Table 4.1 contains a summary of the analytical results from the air samples collected at the Old Bethpage Landfill. These values are in micrograms per cubic meter (ug/m$^3$) and have been adjusted for flow volumes as calibrated from the digital flow meter, temperature and barometric pressure. That is, Samples A1, A2 and A4 are adjusted to total sample volumes of 1,050, 1,020 and 1,060 liters, respectively. Sample A3 was a low sample volume trap with flow volume equalling 105 liters. The table includes the lower quantitation limit for each sample. It should be noted that the lower quantification limit for sample A3 is 1.90 ug/m$^3$ which is 97 times higher than the lower quantification limit for the high volume sample. This in part is responsible for the larger number of compounds reported for A2 than A3. VOC concentration differences between A2 and A3 may be due to one or more of the following: variable and/or localized VOC releases, sampler separation of several feet, and analytical inaccuracies inherent with sample splitting (A3 only). All ambient air sample concentrations have been adjusted for trip and field blank concentrations.

As noted in Table 4.1, three VOCs were measure in excess of the annual guideline concentration (AGC) at both upwind and downwind ambient air sampling locations. These were benzene, carbon tetrachloride and tetrachloroethene. Trichloroethene was also measured in excess of the established AGC at downwind sample A3.

## 4.2 SOIL GAS CONCENTRATIONS

Soil gas concentrations were monitored on October 26, 1992 at all selected soil gas well sites identified in the Consent Decree. Table 4.2 provides a summary of the soil gas concentrations at the wells identified above. These concentration values are reported in micrograms per cubic meter (ug/m$^3$) of soil gas. The table also includes the lower quantitation limit for each sample. All soil gas sample concentrations were adjusted for field blank mass loadings. The shaded values indicate soil gas concentrations are higher than the NYSDEC AGC for ambient air. This occurrence should not be interpreted as an exceedance of the ambient air guideline.

As noted in Table 4.2, two VOCs were measured in excess of the AGC limit at several soil gas well locations. These VOCs were benzene and tetrachloroethene. Benzene was found in excess of the AGC at soil gas well M22. Tetrachloroethene levels exceeded AGC limits at soil gas wells F1, M5, M9(30'), M9(40'), M13, M16, M22 and M37. Note that since the lower quantitation limit exceeds several AGCs, other wells may be in violation of benzene and tetrachloroethene and other compounds with low (<2.3 ug/m$^3$) AGCs. Unfortunately, larger soil gas volumes can not be extracted to improve the lower quantitation limits because of the volume limits within the wells.

## 5.0 SOIL GAS PRESSURE READINGS

Soil gas pressure levels are to be monitored at three different locations around the perimeter of the gas collection system as specified by the Department of Law. This task is identified in the

**TABLE 4.1**

OLD BETHPAGE LANDFILL
OYSTER BAY SOLID WASTE DISPOSAL COMPLEX

**AMBIENT AIR VOST SAMPLE RESULTS**

| SAMPLE TYPE | 24-HR AMBIENT AIR SAMPLE | | | | BLANK | | CURRENT | FORMER |
|---|---|---|---|---|---|---|---|---|
| SAMPLE IDENTIFICATION* | A1 | A2 | A3 | A4 | FB | TB | AGC | AGC |
| VOC COMPOUND NAME | CONC. | CONC. | CONC. | CONC. | (ng) | | (ug/m3) | (ug/m3) |
| Acetone | | | | | | | 14,000 | 35,600 |
| Benzene | 1.52 | 1.69 | 2.29 | 1.61 | | | 0.12 | 100 |
| Bromodichloromethane | | | | | | | 0.02 | 0.03** |
| Bromoform | | | | | | | 12 | 11.9** |
| Bromomethane | | | | | | | | |
| 2-Butanone | 0.0952 | 0.0735 | | 0.179 | | | 300 | 1,967 |
| Carbon Disulfide | | | | | | | 7 | 100 |
| Carbon Tetrachloride | 0.41 | 0.422 | | 0.398 | | | 0.07 | 100 |
| Chlorobenzene | | | | | | | 20 | 1,170 |
| Chloroethane | | | | | | | 63,000 | 52,000 |
| Chloroform | | | | | | | 23 | 167 |
| Chloromethane | 0.0686 | >0.0745 | | >0.132 | | | 770 | 2,100 |
| Dibromochloromethane | | | | | | | 0.1 | 0.03** |
| 1,2-Dichlorobenzene (o) | | | | | | | 200 | 1,000 |
| 1,3-Dichlorobenzene (m) | 0.238 | 0.147 | | 0.189 | | | 200 | 714** |
| 1,4-Dichlorobenzene (p) | | | | | | | 700** | |
| 1,1-Dichloroethane | | | | | | | 500 | 9,524** |
| 1,2-Dichloroethane | | | | | | | 0.039 | 0.2 |
| 1,1-Dichloroethene | | | | | | | 0.02 | 66.7 |
| trans-1,2-Dichloroethene | | | | | | | 360 | 360** |
| 1,2-Dichloropropane | 0.0476 | 0.0500 | | 0.0462 | | | 0.15 | 833** |
| cis-1,3-Dichloropropene | | | | | | | | |
| trans-1,3-Dichloropropene | | | | | | | | |
| Ethylbenzene | 0.790 | 1.18 | | 0.830 | | | 1,000 | 1,450 |
| 2-Hexanone | | | | | | | | |
| 4-Methyl-2-Pentanone | | | | | | | 480 | 683 |
| Methylene Chloride | 0.305 | 0.461 | | 0.368 | | | 27 | 1,170 |
| Styrene | | | | | | | 510 | 716 |
| 1,1,2,2-Tetrachloroethane | | | | | | | 0.02 | 23.2 |
| Tetrachloroethene | 1.71 | 1.37 | 2.10 | 1.51 | | | 0.075 | 1,120 |
| Toluene | >0.781 | 0.843 | 6.67 | >0.698 | | | 2,000 | 7,500 |
| 1,1,1-Trichloroethane | 1.24 | 1.26 | 3.05 | 1.23 | | | 1,000 | 38,000 |
| 1,1,2-Trichloroethane | | | | | | | 0.06 | 150 |
| Trichloroethene | 0.229 | 0.206 | 4.10 | 0.217 | | | 0.45 | 900 |
| Trichlorofluoromethane | 0.819 | 1.04 | | 0.840 | | | 700 | |
| Vinyl Chloride | | | | | | | 0.02 | 0.4 |
| Xylenes (Total) | >2.57 | >1.27 | 4.29 | 1.42 | | | 300 | 1,450 |



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**TABLE 4.1**
**Continued**

OLD BETHPAGE LANDFILL
OYSTER BAY SOLID WASTE DISPOSAL COMPLEX

**AMBIENT AIR VOST SAMPLE RESULTS**

**TENTATIVELY IDENTIFIED TARGET COMPOUNDS**

| SAMPLE TYPE | 24-HR AMBIENT AIR SAMPLE | | | | BLANK | | CURRENT | FORMER |
|---|---|---|---|---|---|---|---|---|
| SAMPLE IDENTIFICATION* | A1 | A2 | A3 | A4 | FB | TB | AGC | AGC |
| VOC COMPOUND NAME | CONC. | CONC. | CONC. | CONC. | (ng) | | (ug/m3) | (ug/m3) |
| Benzaldehyde | | | | | | | | |
| 2-Chloroethyl Vinyl Ether | | | | | | | | |
| Freon 13 | | | | | | | 530 | 133,333** |
| cis-1,2-Dichloroethene | | | | | | | 1,900 | 1,880** |
| Vinyl Acetate | | | | | | | | |

**ADDITIONAL TENTATIVELY IDENTIFIED COMPOUNDS**

| SAMPLE TYPE | 24-HR AMBIENT AIR SAMPLE | | | | BLANK | | CURRENT | FORMER |
|---|---|---|---|---|---|---|---|---|
| SAMPLE IDENTIFICATION* | A1 | A2 | A3 | A4 | FB | TB | AGC | AGC |
| VOC COMPOUND NAME | CONC. | CONC. | CONC. | CONC. | (ng) | | (ug/m3) | (ug/m3) |
| 2,3-Dihydro-1H-Indene | 0.514 | | | | | | | |
| 2,5-Dimethylhexane | 0.495 | | | | | | | |
| 4,6-Dimethylundecane | | 0.863 | | | | | | |
| Hexane | | 0.48 | | 1.51 | | | 420 | |
| Methylcyclopentane | | 0.186 | | | | | 8,300 | 8333** |
| (1-Methylethyl)Benzene | | | 0.924 | | | | | |
| 2-Methylheptane | | | | 0.434 | | | | |
| 2-Methylpentane | | 0.333 | | | | | 830 | |
| 2-Methylhexane | 0.886 | | | 0.934 | | | | |
| 3-Methylpentane | | 1.37 | 4.38 | | | | | |
| 1,1,2-Trichloro-1,2,2-Trifluoroethane | | 0.784 | | | | | 90,000 | 90,476** |

*Sample Identification: (see Figure 2.1)

A1: High volume ambient upwind sample collected at the Battle Row Campground
A2: High volume ambient downwind sample collected 50 feet southwest of well M5
A3: Low volume ambient downwind (A2 duplicate) sample collected 50 feet southwest of well M5
A4: High volume ambient downwind sample collected 100 feet south of well M39.
FB: Field Blank
TB: Trip Blank

**Proposed Value.

All values are reported as ug/m3 except for field blank (FB) and trip blank (TB) mass loading results reported as nanograms (ng). Shaded in values exceed current and/or previous AGCs.

All blank values are less than the lower quantitation limit. The lower quantitation limit for each sample is:

A1 = 0.0190 ug/m3
A2 = 0.0196 ug/m3
A3 = 1.90 ug/m3
A4 = 0.0189 ug/m3

**TABLE 4.2**

OLD BETHPAGE LANDFILL
OYSTER BAY SOLID WASTE DISPOSAL COMPLEX
**SOIL GAS VOST SAMPLE RESULTS**

| SOIL GAS WELL ID | F1 | M2 | M4 | M5 | M6 | M9(10) | M9(20) | M9(30) | M9(40) | M13 | M16 | M21 | M22 | M28 | M31 | M34 | M37 | M39 | Current | Former |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOWER QUANTITATION LIMIT | 2.34 | 2.31 | 2.31 | 2.31 | 27.6 | 2.30 | 23.0 | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 | 20.7 | 2.31 | 2.30 | 2.30 | 2.30 | AGC | AGC |
| VOC COMPOUND NAME | | | | | | | | | | | | | | | | | | | | |
| Acetone | | | | | | | | | | | | | | | | | | | 14,000 | 35,600 |
| Benzene | | | | | | | | | | | | | 2.99 | | | | | | 0.12 | 100 |
| Bromodichloromethane | | | | | | | | | | | | | | | | | | | 0.02 | 0.03* |
| Bromoform | | | | | | | | | | | | | | | | | | | 12 | 11.9 |
| Bromomethane | | | | | | | | | | | | | | | | | | | | |
| 2-Butanone | | 2.89 | | | | | | | | | | | | | | | | | 300 | 1,967 |
| Carbon Disulfide | | | | | | | | | | | | | | | | | | | 7 | 100 |
| Carbon Tetrachloride | | | | | | | | | | | | | | | | | | | 0.07 | 100 |
| Chlorobenzene | | | | | | | | | | | | | | | | | | | 20 | 1,170 |
| Chloroethane | | | | | | | | | | | | | | | | | | | 63,000 | 52,000 |
| Chloroform | | | | | | | | | | | | | | 2.42 | | | | | 23 | 167 |
| Chloromethane | | | | | | | | | | | | | | | | | | | 770 | 2,100 |
| Dibromochloromethane | | | | | | | | | | | | | | | | | | | 0.1 | 0.03* |
| 1,2-Dichlorobenzene (o) | | | | | | | | | | | | | | | | | | | 200 | 1,000 |
| 1,3-Dichlorobenzene (m) | | | | | | | | | | | | | | | | | | | 200 | 714* |
| 1,4-Dichlorobenzene (p) | | | | | | | | | | | | | | | | | | | 700* | |
| 1,1-Dichloroethane | | | | | | | | | | | | | | | | | | | 500 | 9,524* |
| 1,2-Dichloroethane | | | | | | | | | | | | | | | | | | | 0.039 | 0.2 |
| 1,1-Dichloroethene | | | | | | | | | | | | | | | | | | | 0.02 | 66.7 |
| trans-1,2-Dichloroethene | | | | | | | | | | | | | | | | | | | 360 | 360* |
| 1,2-Dichloropropane | | | | | | | | | | | | | | | | | | | 0.15 | 833* |
| cis-1,3-Dichloropropene | | | | | | | | | | | | | | | | | | | | |
| trans-1,3-Dichloropropene | | | | | | | | | | | | | | | | | | | | |
| Ethylbenzene | | | | | | | | | | | | | | | | | | | 1,000 | 1,450 |
| 2-Hexanone | | | | | | | | | | | | | | | | | | | | |
| 4-Methyl-2-Pentanone | | | | | | | | | | | | | | | | | | | 480 | 683 |
| Methylene Chloride | | | | | | | | | | | | | | | | | | | 27 | 1,170 |
| Styrene | | | | | | | | | | | | | | | | | | | 510 | 716 |
| 1,1,2,2-Tetrachloroethane | | | | | | | | | | | | | | | | | | | 0.02 | 23.3 |
| Tetrachloroethene | 4.21 | | | 3.36 | | | | 2.30 | 3.10 | 11.1 | 2.99 | | 2.68 | | | | | 7.13 | 0.075 | 1,120 |
| Toluene | | | | | | | | | 5.05 | | | | 7.83 | | | | | | 2,000 | 7,500 |
| 1,1,1-Trichloroethane | 3.39 | | 4.51 | 3.47 | | | | 2.41 | 4.48 | 3.79 | 4.14 | 3.10 | 3.80 | 3.34 | 2.89 | 2.42 | 2.76 | 3.22 | 1,000 | 38,000 |
| 1,1,2-Trichloroethane | | | | | | | | | | | | | | | | | | | 0.06 | 150 |
| Trichloroethene | | | | | | | | | | | | | | | | | | | 0.45 | 900 |
| Trichlorofluoromethane | 85.3 | 12.7 | 9.48 | 5.09 | 90.8 | 93.0 | | | 8.27 | | 7.93 | 63.2 | 2.30 | 2.42 | 9.24 | 2.88 | 3.22 | 2.30 | 700 | |
| Vinyl Chloride | | | | | | | | | | | | | | | | | | | 0.02 | 0.40 |
| Xylenes (Total) | | | | | | | | | | | | | | | | | | | 300 | 1,450* |

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**TABLE 4.2**
**(Continued)**

OLD BETHPAGE LANDFILL
OYSTER BAY SOLID WASTE DISPOSAL COMPLEX

**SOIL GAS VOST SAMPLE RESULTS**

**TENTATIVELY IDENTIFIED TARGET COMPOUND**

| SOIL GAS WELL ID | F1 | M2 | M4 | M5 | M6 | M9(10) | M9(20) | M9(30) | M9(40) | M13 | M16 | M21 | M22 | M28 | M31 | M34 | M37 | M39 | Current | Former |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOWER QUANTITATION LIMIT | 2.34 | 2.31 | 2.31 | 2.31 | 27.6 | 2.30 | 23.0 | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 | 20.7 | 2.31 | 2.30 | 2.30 | 2.30 | AGC | AGC |
| VOC COMPOUND NAME | | | | | | | | | | | | | | | | | | | | |
| Benzaldehyde | | | | | | | | | | | | | | | | | | | | |
| 2-Chloroethyl Vinyl Ether | | | | | | | | | | | | | | | | | | | | |
| Freon 13 | | | | | | | | | | | | | | | | | | | 530 | 133,333* |
| cis-1,2-Dichloroethene | | | | | | | | | | | | | | | | | | | 1,900 | 1,880* |
| Vinyl Acetate | | | | | | | | | | | | | | | | | | | | |

**ADDITIONAL TENTATIVELY IDENTIFIED COMPOUNDS**

| SOIL GAS WELL ID | F1 | M2 | M4 | M5 | M6 | M9(10) | M9(20) | M9(30) | M9(40) | M13 | M16 | M21 | M22 | M28 | M31 | M34 | M37 | M39 | Current | Former |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LOWER QUANTITATION LIMIT | 2.34 | 2.31 | 2.31 | 2.31 | 27.6 | 2.30 | 23.0 | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 | 2.30 | 20.7 | 2.31 | 2.30 | 2.30 | 2.30 | AGC | AGC |
| VOC COMPOUND NAME | | | | | | | | | | | | | | | | | | | | |
| ** | | | | | | | | | | | | | | | | | | 32.2 | | |
| Limonene | | | | | | | | | | | | 2.76 | | | | | | | | |
| 2-Methylbutane | | 85.5 | | | | | | | 60.8 | | | | | | | 66.7 | | | 8,300 | 8,333 |
| 3-Methyl-5-Propylnonane | | | | | | | | | | | | | | | | | 3.80 | | | |
| alpha-Pinene | | | | | | | | | | | | 8.74 | 53.2 | | | | | 25.3 | | |
| 2,2,5,5-Tetramethylhexane | | | | 2.54 | | | | | | | | | | | | | | | | |

All values are report in micrograms per cubic meter (ug/m3).
All blank values are less than the lower quantitation limit reported for each sample.
Values in shaded areas exceed current and/or previous AGCs.
*Proposed Value
**2,2-Dimethyl-3-Methylenebicyclo[2.2.1] heptane

fifth component of the Consent Decree as shown in RAP Attachment 2 in Appendix A. The objective of monitoring soil gas pressure is to determine the effectiveness of the landfill gas collection system and whether the system needs adjustment or enhancement.

As required by the RAP, pressure readings are to be taken at the following three locations around the perimeter of the gas collection system: (1) northwest of landfill between LGV16 and LGV17 (a new probe), (2) southeast of the landfill between TGV-1 and LGV-9 (a new probe) and (3) south of the landfill at either F-6 or F-9 (existing probes). Figure 2.1 indicates the locations of these three soil gas pressure wells, PW1, PW2 and PW3, respectively. The RAP also states that pressure readings should be taken on a quarterly basis during the initial year of the program. Soil gas pressure readings will be continued for the second year of monitoring on a quarterly basis.

A quarterly soil gas pressure measurement was conducted on October 28, 1992. A 10 inch inclined manometer, manufactured by Dwyer Instruments, Inc. was used to monitor soil gas pressures at each well. The 0-1 inch inclined portion is divided into 0.01 inch increments with the remaining portion (9-10 inches) marked in 0.1 inch increments. There are two probes at different depths (10' and 20') at each location. Pressure readings were taken from each of the six (6) probes.

The readings were conducted between 1130 EDT and 1228 EDT on October 28, 1992. Table 5.1 provides a summary of the soil gas pressure tests. The readings indicate that most pressure probes were under zero or negative pressure at the time of the test. Failure to observe negative pressure at PW1 was believed due to non-operational gas collection probes on top of the landfill and a disconnected section (for repair) of the collection system near PW1. The upper well at PW2 had a zero reading, however, it is believed that it may have been flooded with water since a drainage area within 5 feet of the well contained standing water. The lower probe at PW2 had a substantial negative pressure.

**TABLE 5.1**

OLD BETHPAGE LANDFILL
OYSTER BAY SOLID WASTE DISPOSAL COMPLEX

**SUMMARY OF SOIL GAS PRESSURE TESTS**

| SAMPLE ID | DATE (m/d/yr) | TIME (EDT) | WELL ID | WELL LOCATION | WELL DEPTH (feet) | READINGS (INCHES H2O) | SPECIAL NOTES |
|---|---|---|---|---|---|---|---|
| P1 | 10/28/92 | 1130 | PW1 | NW of landfill by haul road | 10 | 0.00 | 1 |
| P2 | 10/28/92 | 1135 | PW1 | NW of landfill by haul road | 20 | +0.04 | 1 |
| P3 | 10/28/92 | 1146 | PW2 | SE of landfill | 10 | 0.00 | 2 |
| P4 | 10/28/92 | 1148 | PW2 | SE of landfill | 20 | -0.035 | |
| P5 | 10/28/92 | 1156 | PW3 | S of landfill inside FTC | 10 | -0.11 | |
| P6 | 10/28/92 | 1157 | PW3 | S of landfill inside FTC | 20 | -0.11 | |
| P7 | 10/28/92 | 1158 | PW3 | S of landfill inside FTC | 20 | -0.11 | |
| P8 | 10/28/92 | 1159 | PW3 | S of landfill inside FTC | 10 | -0.11 | |
| P9 | 10/28/92 | 1208 | PW2 | SE of landfill | 10 | 0.00 | 2 |
| P10 | 10/28/92 | 1209 | PW2 | SE of landfill | 20 | -0.04 | |
| P11 | 10/28/92 | 1227 | PW1 | NW of landfill by haul road | 10 | 0.00 | 1 |
| P12 | 10/28/92 | 1228 | PW1 | NW of landfill by haul road | 20 | +0.04 | 1 |

FTC - Firemen's Training Center

1- Lack of soil vacuum thought due to non-operational Energy Tactics gas collection wells on top of the landfill and disconnected perimeter collection system in the area of PW1 for repairs (as per Mike Rogers of the Town of Oyster Bay).

2- The upper well (10 feet) at PW2 may have been flooded with water resulting in the zero reading.

APPENDIX A

RAP, ATTACHMENT 2

RAP Attachment 2

OLD BETHPAGE LANDFILL
SUPPLEMENTAL GAS MONITORING PROGRAM

The supplemental landfill gas monitoring program for the Old Bethpage Landfill Remediation Program contains five components. These are 1) the collection of ambient air samples; 2) the collection of subsurface gas samples at a depth of 30"; 3) the collection of subsurface gas samples at depths of 10', 20', 30' and 40'; 4) the collection of thermal oxidizer emission samples (stack testing); and 5) the measurement of gas pressure to ascertain negative pressure created by the gas collection system. These data requirements supplement the existing methane gas monitoring program and will be reported in the annual reports produced under that program.

The location of the proposed sampling points are shown on Drawing No. 1, entitled "Old Bethpage Landfill Zero Percent Methane Gas Migration Contours, 1986 Annual Site Survey". A description of the various components of this program follows.

Ambient Air Samples

Ambient air samples (24 hr. samples) will be collected at three locations around the landfill as shown on Drawing No. 1. One location will be along Winding Road to the east and southeast of the landfill (near M-3 shown on Drawing No. 1). One location will be to the west of the landfill along Round Swamp Road (near M-33). A third location will be north of the landfill (between M-17 and M-22). Samples at these locations will be collected quarterly during the initial year of the program and, if approved by the State, on an annual basis thereafter. Samples will be analyzed for volatile organic compounds.

30" Deep Subsurface Gas Samples

Fourteen subsurface gas samples will be collected at a depth of 30" at the following locations surrounding the landfill as shown on Drawing No. 1: F-1, M-2, M-4, M-5, M-6, M-13, M-16, M-21, M-22, M-28, M-31, M-34, M-37 and M-39. Samples will be collected on a quarterly basis during the initial year of the program and, if approved by the State, on an annual basis thereafter. Samples will be analyzed for volatile organic compounds.

Subsurface Gas Samples at Various Depths

Subsurface gas samples will be collected at depths of 10', 20', 30', and 40' at location M-9 (to be repaired or replaced) shown on Drawing No. 1. Samples will be collected on a quarterly basis during the initial year of the program and, if approved by the State, on an annual basis thereafter. Samples will analyzed for volatile organic compounds.

Thermal Oxidizer Emissions

Thermal oxidizer emissions will be sampled (in the incinerator stack) on a quarterly basis during the initial year of the program. The emissions will be related to oxidizer incinerator temperatures during this initial year of sampling. Thereafter, the oxidizer temperatures will be monitored on a monthly basis to insure that temperatures needed to volatilize the organics are being maintained in the oxidizer. The emissions will continue to be sampled on an annual basis. Samples will be analyzed for volatile organic compounds.

Pressure Readings

Pressure readings will be taken at three locations around the perimeter of the gas collection system to ascertain whether a vacuum is created around the system. This data will assist in monitoring the effectiveness of the system and in determining whether the system needs adjustment or enhancement. One reading will be taken to the south of the landfill at either F-6 or F-9 (existing probes) shown on Drawing No. 1. A new probe will be installed and a reading taken to the northwest of landfill between LGV 16 and LGV 17. The third probe will be installed and a reading taken to the southeast of the landfill between TGV-1 and LGV-9. Pressure readings will be taken on a quarterly basis during the initial year of the program and, if approved by the State, on an annual basis thereafter.

# APPENDIX B

# MONITORING PROTOCOLS AND SAMPLING EQUIPMENT DESCRIPTIONS

# AMBIENT AIR SAMPLING PROTOCOL

1. Obtain pre-conditioned VOST tubes from analytical laboratory and refrigerate with blue ice in the shipping cooler. Prior to testing, inspect the condition of the outer sample holding tube and inner sampling traps and note abnormalities (loose caps, fittings, cracks, Tenax discoloration, etc.).

2. Assemble sampling trains including:
   - o Clean and double rinse coolers with distilled water.
   - o Attach sampling cane.
   - o Calibrate both a high flow (0.70 Lpm) and low flow (0.07 Lpm) Supelco rotameter and set the desired SKC sampling pump flowrate according to manufacturer's specifications.
   - o Attach precalibrated SKC sampling pump and additional battery pack to the exterior of the sampling cooler. For the low flow ambient air sampling train only, attach the two (2) SKC single stage universal flow controllers, in parallel, connecting the pre-set (0.07 Lpm) controller in line with the pump, low flow rotameter and sample line down stream of the sorbent traps.
   - o Install aluminum trap holder and partially fill the cooler (1/4 full) with ice.
   - o Close the cooler lid, cap the sample line inlet and transport the sampling assembly and VOST traps to the selected sampling site.

3. Remove a pair of VOST traps from the shipping container and follow USEPA VOST procedures augmented as follows. Label each trap shipping container with sample number/location. Using precleaned wrenches, install the traps in the modified VOST sampling train.

4. Monitor total VOC concentrations with the portable Photovac Micro-Tip (Micro-Tip) and determine the acceptability of the precalibrated flow rates. Adjust the flow rate according to the Micro-Tip reading. Reading of zero for total VOCs indicates that 1000 liter volume on high flow samples is appropriate. For readings greater than zero, adjust high flow rate sampling interval to accumulate no more than 100 ug of total VOC on a pair of sorbent traps.

5. Perform a system leak check by drawing a vacuum across the entire sampling train by capping the sample inlet. Turn on the pump. Pump failure should occur within 40 seconds. If not, identify and repair the air leak and repeat.

6. Remove cap from sample inlet, start the sampling event by turning on the SKC pump and record the starting time.

7. Examine the pump operation for proper cycling and record rotameter reading, elapsed time, sample location, sample ID and other observations such as Micro-Tip reading, general site conditions, etc.

8. Repeat QA check approximately every four (4) hours. Examine sample lines, ice level, pump operation, note all changes and significant events. Note elapsed and clock times for each observation.

9. At the conclusion of 24-hour sampling period, record sample elapsed and clock times and check sample lines, ice levels, Micro-Tip reading and record observations in the field log. Perform a system leak check as per Item 5 above and note results.

10. Open the sampler lid and remove VOST shipping tubes from the storage/shipping container. Remove the VOST traps, from the sampling train, wrench tighten VOST caps and place in the pre-labeled (Item 3) shipping tubes. Remove the impinger trap, pour contents into a clean septum vial and top off with HPLC water. Label and place in storage/shipping container. Place the VOST shipping tubes in an air freight container with manifest.

11. Disassemble the sampling trains, clean and return to storage.

12. Send the sampling traps and vials to laboratory for analysis.

# SOIL GAS SAMPLING PROTOCOL

Follow procedures defined in the ambient air sampling protocol with the following exceptions.

1. Inspect all soil gas wells for damage and/or leaks and cap. Assemble a soil gas sampling probe consisting of a precleaned stainless steel tube and teflon sampling line and substitute for ambient air probe calibrate a high flow (1.0 Lpm) supelco rotameter.

2. Transport the sampling tubes and sampling train to the field sampling locations.

3. Record the well site ambient VOC reading.

4. Remove the cap from sampling well, insert sampling probe connected to the Micro-Tip and draw sufficient volume of sample to clear lines and sampling probe and well. Record the average and highest VOC reading during line clearing procedure by using the Micro-Tip.

5. Using the last recorded VOC value, determine the sample volume that would effectively place 10 to 100 ug of total VOC's into the VOST traps.

6. Remove the VOST trap pair from the shipping container, label trap and shipping container with sample number and location. Reconnect the soil gas sample probe to the modified VOST unit.

7. Turn on the sampling pump with a 0.5 Lpm to 1.0 Lpm sample rate for 10 minutes if the Micro-Tip reading is zero or for calculated sampling rate and interval if the Micro-Tip provides a non-zero result. Record the starting time and any abnormalities onsite.

8. Record the sampling ending time/rotameter reading. Turn off pump. Record the ambient total VOC reading at the end of the test.

9. Remove the sample VOST traps as per the ambient air sampling procedure.

10. Monitor the soil gas concentration in the well and record the result at end of the test. If greater than the initial total VOC value, submit supplemental data to laboratory regarding special handling instructions, be explicit on volumes and likely concentrations.

## METEOROLOGICAL MONITORING PROTOCOL

1. Establish the weather conditions appropriate for conducting the ambient air and soil gas survey. (Falling atmospheric pressure, steady wind direction over 24-hour period, rainfall less than 30 percent chance).

2. Assemble the precalibrated field meteorological equipment including counterbalanced wind vane, three-cup anemometer, temperature sensor, solid state barometric pressure sensor, precipitation gauge, and a fully programmable CR10 data logger and control module onsite. Select the sites representative of general area circulation patterns.

3. Perform proper alignment checks and begin operation.

4. Record data in 15 minute block averages and translate to hourly values for a period preceding test and during entire ambient air and soil gas survey.

5. Recheck alignments and reasonableness of values at the end of test period and remove equipment. Note all problems/conditions that could influence data accuracy, quality or test results.

6. Prepare a data base in a format suitable for inclusion in the ambient air/soil gas survey.

## VOST SAMPLE TRAIN

A volatile organic sampling train (VOST) similar to USEPA SW-846 Method 0030 was constructed for ambient and ground well measurements of volatile organic compounds (VOCs). The Tenax/Charcoal traps were supplied and analyzed by Research Triangle Laboratories.

The sample train was enclosed in a thermally insulated container with the inlet line and exhaust (vacuum) pump mounted externally.

A 1/4" O.D. teflon tube served as the inlet line. It was connected to the glass open end of the first Tenax/Charcoal trap through a segment of Tygon tubing (1.0"). The other end of the trap was attached to a condensate impinger, whose dry outlet was connected to another Tenax/Charcoal trap (the "Breakthrough" trap) via Tygon tubing (1.0"). The exhaust of this trap exited through Tygon tubing to the sample pump.

The condensate impinger was immersed in an ice water bath during sampling.

## MICRO-TIP HL200
## CALIBRATION AND USE

The Micro-Tip is a hand held analyzer that measures the total concentration of all ionizable chemicals present in the sample. It does not differentiate between individual pollutants.

Prior to use for measuring ambient air and well VOC concentrations, the unit was calibrated. Procedures used are detailed in Chapter 6.3 of the Micro-Tip Users Manual, published by PhotoVac International, Incorporated, 741 Park Avenue, Huntington, New York 11743-9969.

Charcoal filtered ambient air was used as the zero gas. 102 PPM of Isobutylene was employed as the span gas. The HL200 has internal computing capacity to identify zero and span points and make necessary slope adjustments to correct observed values automatically.

## SKC Model 224-PCXR7
## UNIVERSAL SAMPLE PUMP

The pumps used for sampling were electronically flow-controlled to +/- 5% of the set point constant flow. They have automatic shutdown for low battery voltage, pinched hose, or excess back pressure. (See Operating Instructions Universal Sample Pump MOD 224-PCXR7 published by SKC, Inc. National Service Center, 334 Valley View Road, Eighty Four, PA. 15330).

For air samples, the high flow units were programmed to sample continuously for 1,440 minutes at 0.70 Lpm (nominal). A GEL CEL battery was connected in parallel to the pump battery to provide sufficient power for the 24-hour period. The planned sample was 1,000 liters. Low flow samplers were scheduled to run continuously for the 1440 minute test period. The desired total sample volume was 100 liters.

Pre-calibrated Supelco rotameters were used for visual flow checks during sampling. The Supelco rotameters were calibrated using an electronic flow calibrator.

For soil gas samples, the pumps were programmed to sample at approximately 1.0 Lpm for 10 minutes.

The pump setting for both ambient air and soil samples are well within the dynamic range of the sampling units when using the VOST traps.

<u>PUMP CALIBRATOR</u>

An SKC Model 712 Electronic Calibrator (Digital Film Flowmeter) was used to pre-calibrate the nominal flow rate for all Supelco rotameters for field use in determining the pump flow rates during sample collection.

The digital film flow meter is provided with a micro-processor that calculates the flow rate based on bubble meter diameter and elapsed time of passage between two photo-sensor lines. Accuracy for both the pump calibrator and Supelco rotameter is stated at +/- 2%.

The operator calibrated the Supelco rotameters prior to the test. A pre and post calibration and a comparison check on the rotameters was completed.

CLIMATRONICS CORPORATION

# Wind Mark III Wind Sensors

- **Low Threshold**
- **Low Cost**
- **Low Power CMOS Design**
- **Lightweight**
- **Optional External Heaters**

Climatronics' Wind Mark III (WM-III) Wind Sensors combine accuracy and reliability with low cost.

The WM-III sensors meet Environmental Protection Agency's (EPA) Prevention of Significant Deterioration (PSD) requirements. They are also well suited for general wind monitoring applications.

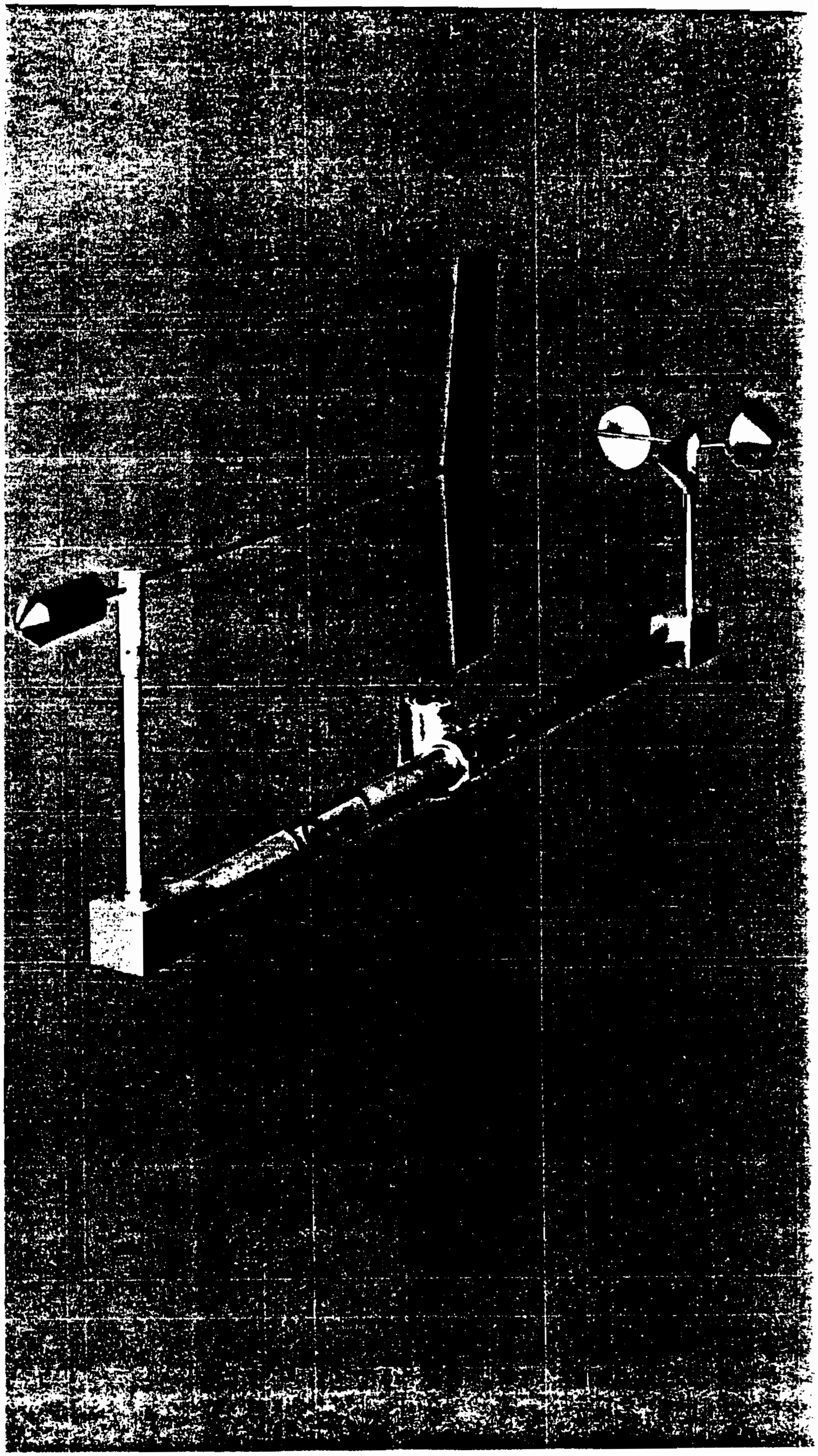
Wind speed is sensed by a three-cup anemometer and is converted to an electrical signal by a 20-hole photochopper, which uses a solid state light source for maximum reliability. Wind direction is sensed by a counterbalanced wind vane coupled to a precision, low-torque potentiometer. Both the wind speed and wind direction sensors use stainless steel precision ball bearings for maximum life and low threshold. Traceability to NBS is available as an option for each anemometer cup assembly by comparison testing against an NBS transfer standard in our wind tunnel test facility.

The sensors and their crossarm are an integral unit. The prewired crossarm mounts on a 3/4-inch IPS vertical pipe stub (1.05 inch O.D.). Orientation of the crossarm is along an East-West plane.

Optional external heaters for both sensors are available. These heaters consume approximately 40 watts of power and are thermostatically controlled.

The WM-III sensor is also available as a wind speed only (P/N 100108-1) or wind direction only (P/N 100108-2) instrument.

Recently, an improved, ruggedized aluminum cup (P/N 101286) and magnesium vane (P/N 101292) combination has been made part of the WM-III sensor package. The original stainless steel cups (P/N 100160) and vinylclad vane (P/N 100107) can still be provided as options. To safely transport the WM-III sensors with cups and vane, a transit case (P/N 100255) is available.



Signal conditioners for the WM-III sensors are available in modular form with a variety of full scale ranges, engineering units, outputs, and several other options. Please consult the Modular Meteorological System (MMS) and the Remote Meteorological System (RMS) bulletins for more details.

The WM-III sensors are standard equipment in the Utility Wind System and the Electronic Weather Station (EWS). Please consult these bulletins for additional information.

## SENSOR SPECIFICATIONS

| PERFORMANCE | WM-III WIND SPEED | WM-III WIND DIRECTION |
|---|---|---|
| Accuracy | ±0.11 m/s (0.25 mph) or +1.5% | ±3° |
| Threshold | < 0.45 m/s (< 1.00 mph) | < 0.45 m/s (< 1.00 mph) |
| Distance Constant | 4.6m (15.0 ft.) of air max.<br>2.4m (8.0 ft.) of air max.-optional | 4.6m (15.0 ft.) of air max.<br>2.4m (8.0 ft.) of air max. - optional |
| Damping Ratio | | 0.4 to 0.6 at 10° initial angle of attack |
| Operating Range | 0-55 m/s (0-125 mph) | 0° to 360° — mechanical<br>0° to 355° — electrical |

## ELECTRICAL SPECIFICATIONS

| | | |
|---|---|---|
| Signal Output | Nominal 2.0 Vpp into 4.7 K ohm, frequency proportional to wind speed, amplitude dependent on supply voltage | Variable DC voltage, magnitude proportional to wind direction. |
| Power Requirements* | 6-12 Vdc at 1 mA nominal | Max. 5 mA through 2 K ohms |

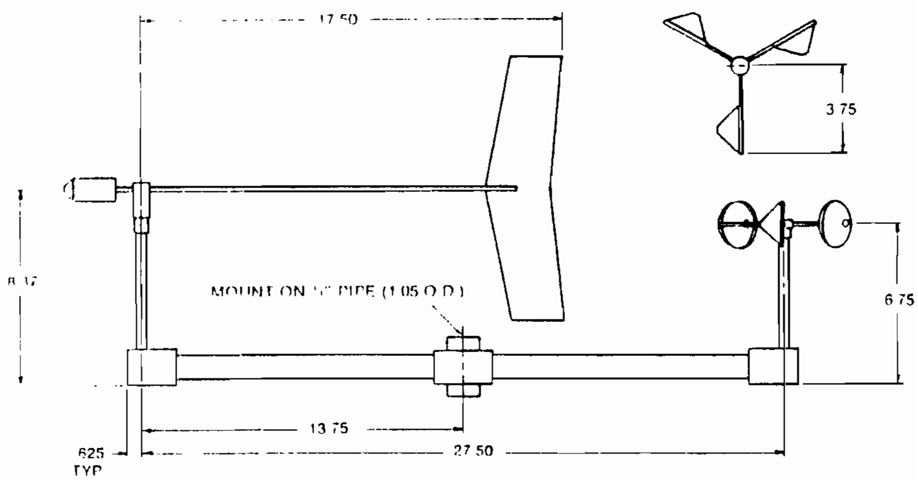
*Proper power provided by Climatronics' signal conditioner.

## PHYSICAL SPECIFICATIONS

| | | |
|---|---|---|
| Weight | Less than 0.9 kg. (2 lbs.) | Less than 0.9 kg. (2 lbs.) |
| Turning Radius | 9.5 cm (3.75 inch) | 41.9 cm (17.5 inch) |
| Operating Temperature | -40° to 60° C (-40° to 140° F) | -40° to 60° C (-40° to 140° F) |
| Use with Signal Conditioner | P/N 100161 (MMS)<br>P/N 100778 (RMS) | P/N 100161 (MMS)<br>P/N 100779 (RMS) |

## SENSOR HEATER SPECIFICATIONS

| | | |
|---|---|---|
| Power Requirements | 115 Vac; 60 Hz. 20 Watts per sensor | (P/N 101234) |

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CLIMATRONICS CORPORATION

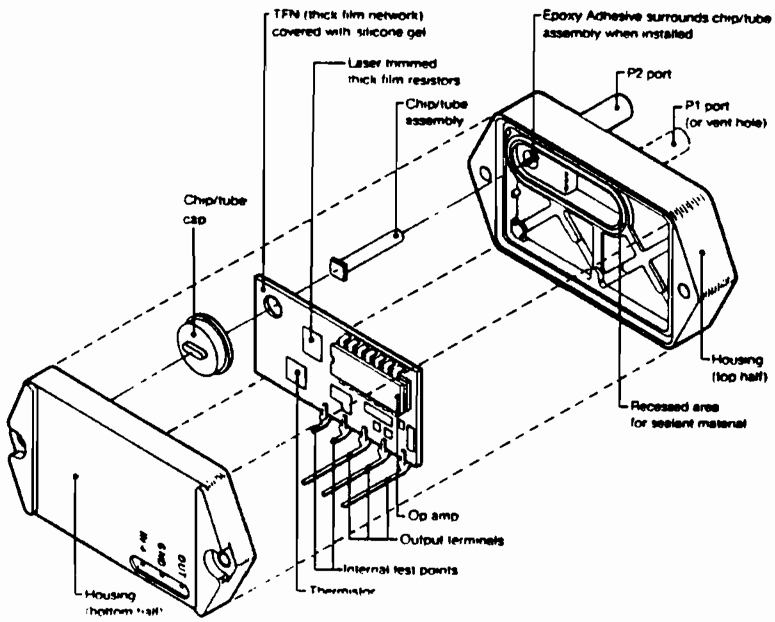
# SOLID-STATE BAROMETRIC PRESSURE SENSOR

Climatronics' Solid-State Barometric Pressure Sensor (P/N 101448) uses a piezoresistive device to measure atmospheric pressure and is ideally suited to applications requiring exact measurement of pressure where the benefits of repeatability, low hysteresis and long-term stability are important. It offers state-of-the-art benefits of hybrid IC devices, including compactness, ruggedness, and reliability. Internal circuitry provides temperature compensation as an integral part of each device and is optimized on each unit as part of the calibration procedure.

The heart of the Solid-State Barometric Pressure Sensor is a small, square silicon chip with an integral sensing diaphragm and implanted piezoresistors. Pressure applied on the diaphragm causes it to flex, inducing a stress or strain in the buried resistors. The resistor values will change depending on the amount of pressure applied to the diaphragm. By providing a precisely-controlled reference voltage to the sensor's resistive network, an output voltage signal is produced which is proportional to the ambient pressure. Because of the unique construction, this output is very predictable, providing an ideal sensing element for barometric pressure sensors.

The range of this Solid-State Barometric Pressure Sensor is 600-1100mb. It can be used with Climatronics' modular signal conditioners or interfaced directly to a Remote Terminal Unit (RTU) for direct digital data acquisition.

EXPLODED VIEW



## SPECIFICATIONS

| | |
|---|---|
| Range | 600mb to 1100mb (17.72" Hg. to 32.48" Hg.) |
| Accuracy (includes temperature, co-efficient, hys-teresis, and linea-rity) | ±1.5mb |
| Resolution | Infinite |
| Temperature Range | |
| Compensated | -18°C to 63°C (0°F to 145°F) |
| Operating | -40°C to 85°C (-40°F to 185°F) |
| Elevation Range | Sea Level to 14,000 ft.<br>Sea Level to 4265m |
| Input Voltage | +12 Vdc (nominal) |
| Output Voltage | 1 to 5 Vdc |
| Power Required | 0.18 Va |
| Size - Sensor | 3"L x 2"W x 1½"H |
| Enclosure (Optional) | 7 1/8"L x 4¼" W x 5 1/8" H |

CLIMATRONICS CORPORATION
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Airport International Plaza
Bohemia, New York 11716
(516) 567-7300
TLX: 5101007669
FAX: (516) 567-7585

## SENSOR SPECIFICATIONS — P/N 100108

| | WM-III Wind Speed | WM-III Wind Direction |
|---|---|---|
| Performance | (P/N 100108-1) | (P/N 100108-2) |
| Accuracy | ±0.11 m/s (0.25 mph) or +1.5% | ±2° |
| Threshold | 0.34 m/s (0.75 mph) | 0.34 m/s (0.75 mph) |
| Distance Constant | 4.6m (15.0 ft.) of air max.<br>2.4m (8.0 ft.) of air max. - optional | 4.6m (15.0 ft.) of air max.<br>2.4m (8.0 ft.) of air max. - optional |
| Damping Ratio | | 0.4 to 0.6 at 10° initial angle of attack |
| Operating Range | 0-55 m/s (0-125 mph) | 0° to 360° — mechanical<br>0° to 540° — electrical |

### ELECTRICAL SPECIFICATIONS

| | | |
|---|---|---|
| Signal Output | Nominal 2.0 Vpp into 4.7 K ohm, frequency proportional to wind speed, amplitude dependent on supply voltage | Variable DC voltage, magnitude proportional to wind direction |
| Power Requirements | 6-12 Vdc at 1 mA* nominal | Max. 5 mA through 2 K ohms* |

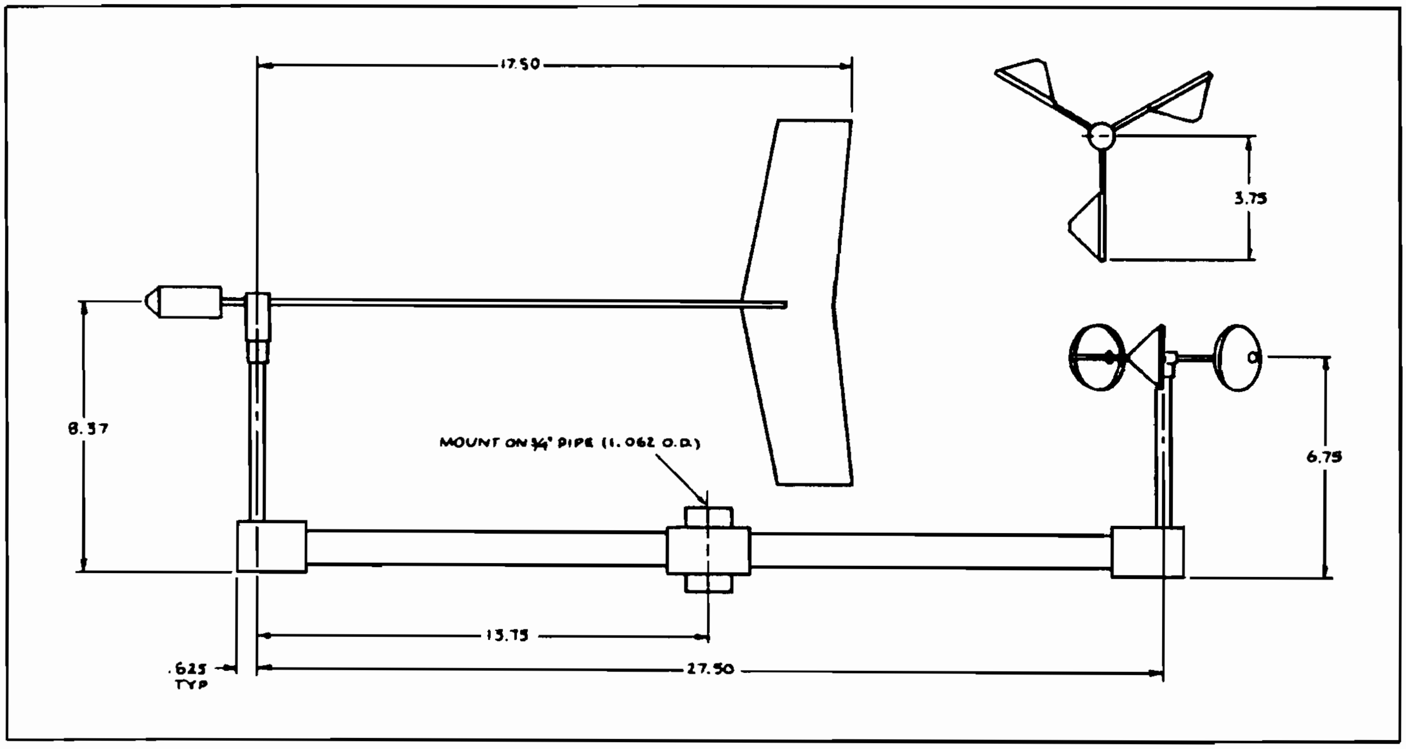
*Proper power provided by translator module.

### PHYSICAL SPECIFICATIONS

| | | |
|---|---|---|
| Weight | Less than 0.9 kg. (2 lbs.) | Less than 0.9 kg. (2 lbs.) |
| Turning Radius | 9.5 cm (3.75 inch) | 41.9 cm (16.5 inch) |
| Operating Temperature | -40° to 60°C (-40° to 140°F) | -40° to 60°C (-40° to 140°F) |
| Use with Translator | P/N 100163 (MMS)<br>P/N 100778 (RMS) | P/N 100163 (MMS)<br>P/N 100779 (RMS) |

### SENSOR HEATER SPECIFICATIONS

| | |
|---|---|
| Power Requirements | P/N 101235 115 Vac; 60 Hz, 40 Watts per sensor |



# IMP-860 DATALOGGER

- Direct sensor inputs
- Control outputs
- User programmable
- Built-in data instruction set
- Large internal data storage
- Solid-state data cartridges
- Phone line, dedicated line or radio telemetry
- PC compatible
- Low power
- Choice of enclosures
- Built-in surge protection

The IMP-860 Datalogger is an extremely versatile, state-of-the-art, digital data acquisition system designed for environmental monitoring applications. It can function as a remote, stand-alone station or can be operated with a central computer either by itself or in a network with other units.

Sensor inputs are accepted directly by the IMP-860, thereby eliminating the need for additional signal conditioning equipment. The signals will be processed as necessary, computations will be performed as required, and the data will be stored in internal memory for later retrieval by a remote computer or on a removable storage medium for manual retrieval.

User programming of the IMP-860 is easily accomplished using either an IBM PC-compatible computer or an operational, portable keyboard/display unit. A comprehensive set of programming instructions is included which allows a multitude of calculations to be performed on any desired channel, including interactions between channels. A standard program is available and can be modified by the user at any time.

The following electrical specifications are valid for an ambient temperature range of -25 °C to +50 °C unless otherwise specified.

## ANALOG INPUTS

NUMBER OF CHANNELS: 12 single ended or 6 differential with any combination, software selectable.

CHANNEL EXPANSION: Increments of 32 channels multiplexed through a single **IMP-860** channel with the Model **CAM32 Relay Scanner. Maximum of 8 CAM32s possible.**

ACCURACY OF VOLTAGE MEASUREMENTS AND ANALOG OUTPUT VOLTAGES: 0.2% of FSR, 0.1% of FSR (0 to 40 °C).

RANGE AND RESOLUTION: Ranges are software selectable for any channel. Resolution for single ended measurements is twice the value shown.

| Full Scale Range | Resolution |
|---|---|
| ±2.50 volts | 333. microvolts |
| ±0.25 volts | 33.3 microvolts |
| ±25.0 millivolts | 3.33 microvolts |
| ± 7.5 millivolts | 1.00 microvolts |
| ± 2.5 millivolts | 0.33 microvolts |

INPUT SAMPLE RATES: The fast or slow A/D conversion uses a 250 us or 16.666 ms signal integration time (16.666 ms is one AC power line cycle). Differential measurements include a second sampling with reversed input polarity to reduce thermal offset and common mode errors. Input sample rates are the time required to measure and convert the result to engineering units. Times do not include the self-calibration measurement which occurs once per instruction.

| | |
|---|---|
| Fast single ended voltage: | 2.4 ms |
| Fast differential voltage: | 3.7 ms |
| Slow single ended voltage: | 18.8 ms |
| Slow differential voltage: | 37.0 ms |
| Fast dif. thermocouple: | 8.3 ms |

INPUT NOISE VOLTAGE:
Fast differential — 0.83 microvolts RMS
Slow differential — 0.10 microvolts RMS

COMMON MODE RANGE: ±2.5 volts.

DC COMMON MODE REJECTION: >140 dB.

NORMAL MODE REJECTION: 70 dB (60 Hz with slow differential measurement).

INPUT CURRENT: 3 nanoamps max.

INPUT RESISTANCE: 200 gigohms.

## EXCITATION OUTPUTS

DESCRIPTION: The [illegible] has 3 switched excitations, active only during measurement, with only one output active at any time. The off state is high impedance.

RANGE: ±2.5 volts.

RESOLUTION: 0.67 millivolts.

ACCURACY: Same as voltage input.

OUTPUT CURRENT: 20 mA @ ± 2.5 V, 35 mA @ ± 2.0 V, 50 mA @ ± 1.5 V.

FREQUENCY SWEEP FUNCTION: A swept frequency square wave output between 0 and 2.5 volts is provided for vibrating wire transducers. Timing and frequency range are specified by the instruction.

## PERIOD AVERAGING MEASUREMENTS

DEFINITION: The time period for a specified number of cycles of an input frequency is measured, then divided by the number of cycles to obtain the average period of a single cycle.

INPUTS: Any single ended analog channel with configuration defined in the user program. Signal dividing may be required to eliminate interference with measurements on adjacent channels.

INPUT FREQUENCY RANGE:

| Range Code | Preamp Gain | Input Hysteresis | Maximum Frequency |
|---|---|---|---|
| 4 | 1 | 10 mV | 200 kHz |
| 3 | 10 | 1 mV | 50 kHz |
| 2 | 33 | 300 uV | 20 kHz |
| 1 | 100 | 100 uV | 8 kHz |

REFERENCE ACCURACY: ±20 ppm.

RESOLUTION: ±60 nanoseconds divided by the number of cycles measured. Resolution is reduced by signal noise and for signals with a slow transition through the zero voltage threshold.

TIME REQUIRED FOR MEASUREMENT: Signal period times the number of cycles measured plus 1.5 cycles; minimum measurement time is 2 ms.

## RESISTANCE AND CONDUCTIVITY MEASUREMENTS

ACCURACY: 0.015% of full scale bridge output, limited by the matching bridge resistors. The excitation voltage should be programmed so the bridge output matches the full scale input voltage range.

MEASUREMENT TYPES: 6 wire and 4 wire full bridge; 4 wire, 3 wire, and 2 wire half bridge. Bridge measurements are ratiometric and dual polarity to eliminate thermal emf's. AC resistance measurements use a dual polarity 750 us excitation pulse for ionic depolarization, with the signal integration occurring over the last 250 us.

## PULSE COUNTERS

NUMBER OF PULSE COUNTER CHANNELS: 2 eight bit or 1 sixteen bit selectable.

MAXIMUM COUNT RATE: 2000 Hz, eight bit counters; 250 kHz, sixteen bit counters. Pulse counter channels scanned at 8 Hz.

MODES: Switch closure, high frequency pulse, and low level AC.

SWITCH CLOSURE MODE
Minimum Switch Closed Time: 5 ms.
Minimum Switch Open Time: 6 ms.
Maximum Bounce Time: 1 ms open without count.

HIGH FREQUENCY PULSE MODE
Minimum Pulse Width: 2 us.
Maximum Input Frequency: 250 kHz.
Voltage Thresholds: Count upon transition from below 1.5 V to above 3.5 V.
Maximum Input Voltage: ±20 V.

LOW LEVEL AC MODE
(Typical of magnetic pulse flow sensors, selected anemometers, etc.)

Min. AC Input Voltage: 6 mV RMS.
Input Hysteresis: 11 mV.
Max. AC Input Voltage: 20 V RMS.

Frequency Range:

| AC Input (RMS) | Range |
|---|---|
| 20 millivolts | 1 Hz to 100 Hz |
| 50 millivolts | 0.5 Hz to 400 Hz |
| 150 millivolts to 20 V | 0.3 Hz to 1000 Hz |

(Consult factory if higher frequencies are desired.)

## DIGITAL I/O PORTS

8 ports, software selectable as binary inputs or control outputs.

OUTPUT VOLTAGES (no load): high — 5 V ± 0.1 V; low — < 0.1 V.

OUTPUT RESISTANCE: 500 ohms.

INPUT STATE: high — > 3 V; low — < 0.8 V.

INPUT RESISTANCE: 100 kohms.

## TRANSIENT PROTECTION

All input and output connections to the **IMP-860** module are protected using RC filters or transzorbs connected to a heavy copper bar between the circuit card and the case. The **IMP-860** Wiring Panel includes additional spark gap and transzorb protection.

## CPU AND INTERFACE

PROCESSOR: Hitachi 6303.

MEMORY: 32k ROM, 16k RAM expandable to 64k.

DISPLAY: 8 digit LCD (0.5" digits).

PERIPHERAL INTERFACE: 9 pin D-type connector for keyboard/display, storage module, cassette, modem, printer, and RS232 adapter. Baud rates selectable at 300, 1200, 9600, and 76,800.

CLOCK ACCURACY: ±1 minute per month.

MAXIMUM PROGRAM EXECUTION RATE: System tasks initiated in sync with real-time up to 64 Hz. One measurement with tape transfer is possible at this rate without interruption.

## SYSTEM POWER REQUIREMENTS

VOLTAGE: 9.6 to 16 volts.

TYPICAL CURRENT DRAIN: 0.5 mA quiescent, 13 mA during processing, and 35 mA during analog measurement.

BATTERIES: 7.5 Ahr alkaline D-cells or 5 Ahr rechargeable lead acid batteries, standard.

## PHYSICAL SPECIFICATIONS

SIZE: 7.8" x 3.5" x 1.5"; 9" x 3.5" x 2.9" with **IMP-860** Wiring Panel. Input connectors extend length 0.15".

WEIGHT: 2 lbs.

## WARRANTY

Two years against defects in materials and workmanship.

CLIMATRONICS CORPORATION
140 Wilbur Place
Airport International Plaza
Bohemia, New York 11716
(516) 567-7300
TLX: 5101007669
FAX: (516) 567-7585

# PRECIPITATION GAUGES

- RELIABLE AND ACCURATE
- TIPPING AND WEIGHING BUCKETS
- ENGLISH OR METRIC MEASURE
- OPTIONAL ELECTRIC/PROPANE HEAT

Climatronics offers a variety of precipitation gauges, which are all accurate and durable. Models are available for both AC and DC powered systems, with or without heaters.

Tipping Bucket Gauges are available with screened funnels of 6 or 8-inch diameter. Precipitation is channeled to a triangular bucket which tips for every 0.01 inch of water collected. When the bucket empties it activates a sealed reed switch; which sends an event message to the signal conditioner. Upon tipping, the accumulated water is drained.

Both tipping bucket sensors can be provided with optional electric heaters for AC powered systems. In addition, the 8 inch version can accommodate a propane heater for DC powered systems. The heaters prevent data loss during freezing conditions and melt snow so the water content may be measured by the tipping bucket. Either type of gauge is easy to install; requiring a level piece of ground that is free from obstruction. Signal conditioners are available in modular form with an input range of 0-1 inch (0-2.5 cm) or 0-10 inch (0-25 cm), corresponding standard output ranges of 0-1 or 0-5 Vdc.

A wind shield is available to prevent undue turbulence near the sensor funnel, insuring a representative data capture.

## SENSOR SPECIFICATIONS

| | *6" Tipping Bucket P/N 100508 | **8" Tipping Bucket P/N 100097 |
|---|---|---|
| ACCURACY | ±1% up to 7.5 cm/hr (3 inch/hr.) | ±3% for rain rates of 2.54 to 15.24 cm/hr (1 to 6 inch/hr.) |
| | ±5% up to 25 cm/hr (10 inch/hr) | |
| RESOLUTION (Sensitivity) | 0.025 cm (0.01 in.) | 0.025 cm (0.01 in.) |

## ELECTRICAL SPECIFICATIONS

| | *6" Tipping Bucket P/N 100508 | **8" Tipping Bucket P/N 100097 |
|---|---|---|
| POWER REQUIREMENTS (Without Heat) | [1] None | [1] None |
| OUTPUT | Switch Closure | Switch Closure |
| CONTACT RATING | 2 amps @ 12 Vdc | 3 amps @ 50 Vdc |

## PHYSICAL SPECIFICATIONS

| | *6" Tipping Bucket P/N 100508 | **8" Tipping Bucket P/N 100097 |
|---|---|---|
| SIZE | 26.0 H x 15.9 cm Dia. (10.25 H x 6.25 in Dia.) | 46.3 H x 20.3 cm Dia. (18.25 H x 8 in Dia.) |
| WEIGHT | 1.1 Kg (2.5 lbs) | 11.4 Kg (25 lbs) |
| OPERATING TEMPERATURE (Heated) | -40°C to +60°C (-40°F to +140°F) | -40°C to +60°C (-40°F to +140°F) |
| USE WITH SIGNAL CONDITIONER | P/N 100747 (MMS) P/N 100840 (RMS) | P/N 100747 (MMS) P/N 100840 (RMS) |

[1] Power supplied by Signal Conditioner
* Electric Heat Available, 40 watts
** Electric and Propane Heat Available (Electric Heat, 200 watts)

CLIMA TRONICS CORPORATION
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Airport International Plaza
Bohemia, New York 11716
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# APPENDIX C

# CHRONOLOGY
# AMBIENT AIR AND SOIL GAS SAMPLING EVENTS

## CHRONOLOGY - AMBIENT AIR SAMPLING

### SAMPLE 2-1A1

**- OCTOBER 26, 1992**

Started sampler A-1 using pump B and sampling unit #1 at 1031 EDT. The nominal flow rate was 0.7 liters per minute (Lpm). The sampler was programmed to run 1440 minutes continuously for 24 hours. The sampling location was A1 as shown in Figure 2.1. This location is outside the landfill property at an open area on the east end of the Battle Row Campground. The Campground is located west of the landfill. This was an upwind high volume (1,000 liter) sample. The initial ambient VOC concentration was 0.0 ppm, and the initial rotameter reading was 85 units. A leak check was performed before sampling, and no leak was found. A maximum and minimum thermometer was set inside the sampler to record the temperature change.

Checked rotameter readings at 1318 EDT, 1720 EDT and 2142 EDT, the readings were 90 units, 88 units and 89 units, respectively. The recorded total elapse times were 167 minutes, 408 minutes and 670 minutes, respectively. The operator observed medium to high wind speed gusts and noted them in the data sheet.

**- OCTOBER 27, 1992**

The operator checked the sampler three times (0138 EDT, 0642 EDT, and 0959 EDT) and the rotameter readings were at 89, 87 and 92 units with the total elapse times of 906, 1210 and 1408 minutes, respectively. The pump operation was normal during the whole sampling period. No unusual events were noted. The sampler was removed from service at 1031 EDT with the total elapse time of 1440 minutes. The ambient VOC reading was 0.4 ppm. The recorded maximum temperature inside the sampling cooler was 52°F.

SAMPLE 2-1A3

- OCTOBER 26, 1992

The A-3 sampler was started at 0945 EDT with pump #4 and sampling unit #3. This was a low volume, downwind sample. The nominal flow rate was 0.070 Lpm and the nominal sample volume was 100 liters. The sample location was also southeast of the landfill, approximately two feet from sampler A-2. The initial ambient VOC concentration was 0.0 ppm. The initial rotameter reading was 50 units. A leak check was performed before the sampler was started and all connections were leak free.

Sampler A-3 was inspected again at 1144 EDT, 1310 EDT, 1519 EDT and 1737 EDT. No problems were found. The rotameter reading was 52 units during each observation. The operator checked the sampler again at 2132 EDT, the rotameter reading was 51 units.

- OCTOBER 27, 1992

Checked A-3 sampler at 0125 EDT, 0631 EDT, and 0926 EDT. The rotameter indicated readings of 51 units. Checked the sampler again at the end of sampling; all connections were in order. The sampler was removed from service at 0944 EDT according to the established protocol with a total elapse time of 1399 minutes. The final ambient VOC reading was 0.0 ppm. The recorded maximum temperature inside the sampler was 52°F.

SAMPLE 2-1A4

- OCTOBER 26, 1992

Sampler A-4 was positioned northeast of the landfill, southwest of the landfill water treatment facility, as shown on Figure 2.1. This was a second upwind high volume sample. Sampling was started at 0858 EDT. Pump D was programmed to run at a nominal flow rate of 0.7 Lpm for 1440 minutes over 24 hours to collect 1000 liters of sample. Sampling unit #4 was utilized. A leak check was performed before the sampler was started and no leakage was observed. Maximum and minimum thermometer was placed inside the sampler. The rotameter reading was 85 units at the beginning of the test. Micro-Tip meter indicated an initial ambient VOC concentration of 1.5 ppm.

Sampler A-4 was inspected again at 1305 EDT, 1514 EDT, 1725 EDT, 1726 EDT and 2128 EDT, the rotameter readings at the above times varied from 84 to 94, operator noted all readings on the data sheet.

**- OCTOBER 27, 1992**

The operator checked sampler A-4 at 0121 EDT, 0626 EDT and 0847 EDT. The rotameter readings were at 86, 86 and 84 units, respectively.

The unit was taken out of service at 0858 EDT according to established protocols. The recorded pump total elapse time was 1440 minutes. The final ambient VOC concentration was 0.0 ppm. The recorded maximum temperature was 52°F. No unusual events were observed during the sampling period.

## CHRONOLOGY - SOIL GAS SAMPLING

OCTOBER 26, 1992

- SAMPLE 2-1F1

Sample 2-1F1 was collected from well F1 (30"deep) located inside the Firemans' Training Center about eight feet away from a fenced subsurface vault. Pump #1 was used with sampler unit #5. The nominal flowrate was 1.0 Lpm and the nominal sample volume was 10 liters. The initial ambient VOC concentration was 0.0 ppm. The initial well VOC reading was 0.9 ppm. The well was evacuated for 30 seconds to pull a full well volume of stagnant air prior to sampling. Sampling started at 1136 EDT with an initial rotameter reading of 105 units at the bottom of the ball. A leak check was performed prior to sampling on all connection lines.

Sampling stopped at 1146 EDT as scheduled. The final rotameter reading was still 105 units. The final ambient air and well VOC readings were 0.0 ppm and 2.5 ppm, respectively.

- SAMPLE 2-1M2

Sample 2-1M2 was collected between 1203 EDT and 1213 EDT from well M2 (30"deep). This well was located next to the landfill property along the west side of Winding Road. Pump #1 and sampler unit #5 were used. The nominal flowrate was 1.0 Lpm. A leak check was performed prior to sampling and all connection lines. One full well volume of stagnant air was evacuated. Initial ambient air, sample inlet line and well VOC readings were taken and the readings were 0.0 ppm, 0.0 ppm and 0.8 ppm, respectively. The test ended at 1213 EDT. The rotameter reading was 105 units during the 10 minute sampling period. Both final ambient air and well VOC concentrations were 0.0 ppm.

- SAMPLE 2-1M4

Sample 2-1M4 was collected from the 30" deep soil gas well M4 located along the east side of Winding Road. Pump #1 and sampler unit #5 were used with a nominal flowrate of 1.0 Lpm to collect 10 liters of sample. A leak check was performed as part of the procedure.

Initial VOC concentrations were measured for ambient air, inlet line and well; all readings were 0.0 ppm. The well was conditioned by evacuating a full well volume of stagnant air.

Sampling started at 1224 EDT and lasted for 10 minutes as scheduled. The final ambient air and well VOC concentrations were measured again and the results were 0.0 ppm.

**- SAMPLE 2-1M5**

Sample 2-1M5 was collected from well M5, a 30" deep well located west of Winding Road east of the landfill. The nominal flowrate was 1.0 Lpm. Initial ambient air, inlet line and well VOC concentrations were taken and all readings were 0.0 ppm. After the leak check, the sampler was started at 1247 EDT.

The sampler was stopped at 1257 EDT. During the sampling period the rotameter reading remained at 105 units. The final ambient air and well VOC readings were 0.0 ppm and 5.6 ppm, respectively.

**- SAMPLE 2-1M6**

This sample was taken from soil gas well M6 (30"deep) located on the east side of Winding Road east of the landfill about 60 feet north of M4. Pump #1 and sampler unit #5 were used. The nominal flowrate was 1.0 Lpm. The initial ambient air VOC concentration was 0.0 ppm. The initial well VOC concentration was measured at 35.0 ppm. Moisture was observed inside the inlet line and was believed responsible for the high Micro Tip VOC reading (positive VOC concentration bias). The sampling line was replaced with an new line before sampling started. The system leak check passed and sampling started at 1356 EDT and lasted for 10 minutes.

The final ambient VOC concentration was 0.8 ppm. The final rotameter reading was 105 units which was the same as the initial reading. The final well VOC reading was 18.0 ppm. Again, condensed moisture in the Micro Tip sensor may have caused a positive VOC concentration bias. This was observed throughout the remaining tests.

- SAMPLE 2-1M13

This sample was collected from well M13 (30"deep). This well was located east of Winding Road. Pump #1 and sampler unit #5 were used. The initial ambient air, inlet line and well VOC readings were 0.5 ppm, 0.8 ppm and 2.9 ppm, respectively. The nominal flowrate and volume were 1.0 Lpm and 10 liters, respectively. A leak check was conducted on all connections. Sampling started at 1440 EDT and the initial rotameter reading was 105 units.

Sampling ended at 1450 EDT. The rotameter reading remained at 105 units from the beginning to the end of sampling. The final ambient air and well VOC concentrations were taken and the results were 1.2 ppm and 3.4 ppm, respectively.

- SAMPLE 2-1M16

Sample 2-1M16 was collected between 1503 EDT and 1513 EDT from the 30" deep well M16 located on the west side of Winding Road east of the landfill. Pump #1 and sampler unit #5 were used with 1.0 Lpm nominal flowrate to collect 10 liters of sample. A leak check was performed. Initial ambient and inlet line VOC concentrations were both 0.9 ppm. The initial well VOC concentration was 4 ppm. The rotameter reading remained at 105 units during the entire sampling period.

Final ambient air and well VOC readings were 1.2 ppm and 13.1 ppm, respectively. A new sampling line was used for this test.

- SAMPLE 2-1M21

This sample was collected from well M21 (30" deep) located on the west side of the landfill east of Claremont Road. Pump #1 and sampler unit #5 were used. A leak check was performed before sampling. The nominal flowrate was 1.0 Lpm and the nominal sample volume was 10 liters. The initial ambient air and well VOC readings were 1.0 ppm and 9.4 ppm, respectively. The stainless steel sampling rod was inserted only about 19" down into the well due to dirt and water build up inside.

The collection started at 1528 EDT and ended at 1538 EDT. During the 10 minute sampling period, the rotameter reading remained at 105 units. Final ambient air and well VOC conditions were measured at 1.5 ppm and 12.4 ppm, respectively. The operator observed the air temperature inside the sampler. The maximum temperature was 58°F. This thermometer was set inside sampler unit #5 before the first well sample was taken.

**- SAMPLE 2-1M9 (10')**

This sample was taken from one of the four deep wells located at M9. Sample 2-1M9 was collected from the 10 foot deep well marked with blue color. Pump #1 and sampler unit #5 were used. The nominal flowrate and volume were 1.0 Lpm and 10 liters, respectively. The well was evacuated for 1.5 minutes before sampling to remove one full volume of stagnant air inside the well. The evacuation was done using a spare pump and sampling line. A sampling train leak check was performed. The initial ambient air and well VOC concentrations were measured at 2.1 ppm and 8.5 ppm, respectively. Sampling started at 1602 EDT. Initial rotameter reading was 105 units and remained at that level for the 10 minute sampling period.

The sampler was stopped at 1612 EDT. Final ambient air and well VOC readings were recorded and the results were 1.8 ppm and 19.0 ppm, respectively.

**- SAMPLE 2-1M9 (20')**

This sample was collected from the 20 foot deep well at M9. This well was marked with green color. Pump #1 and sampler unit #5 were used. The well was evacuated for three minutes before sampling and a sampling train leak check was performed. Initial ambient air and well VOC concentrations were recorded; the results were 2.2 ppm and 54.0 ppm, respectively. The sampling started at 1618 EDT and finished at 1628 EDT. The rotameter reading remained at 105 units throughout the sampling. Final ambient VOC concentration was 2.0 ppm and the final well VOC concentration dropped to 9.4 ppm.

**- SAMPLE 2-1M9 (30')**

This sample was collected from the 30 foot deep well located at M9. The well was marked with red color. Pump #1 and sampler unit #5 were used. The well was evacuated for 4.5

minutes before sampling started and a sampling train leak check was performed. The nominal flowrate was 1 Lpm, and nominal sample volume was 10 liters. Initial ambient air and well VOC concentrations were 1.9 ppm and 4.4 ppm, respectively. Testing started at 1635 EDT with initial rotameter reading of 105 units.

Sampling ceased at 1645 EDT. The final rotameter reading was 105 units and final ambient air and well VOC readings were 2.0 ppm and 9.0 ppm, respectively.

**- SAMPLE 2-1M9 (40')**

This sample was collected from the 40 foot well at M9. This well was marked with yellow color. Pump #1 and sample unit #5 were used. The well was evacuated at 1.0 Lpm for 6 minutes prior to sampling to remove one full well volume of stagnant soil gas. Operators observed some condensed water formed inside the tygon tube that was used to condition the well. The pump and lines used for evacuating the well were not used for sampling. The leak check was approved prior to the testing. The nominal sampling volume was 10 liters, the nominal sampling rate was 1.0 Lpm. The initial ambient air, inlet line and well VOC concentrations were recorded and the readings were 2.1 ppm, 6.0 ppm and 9.1 ppm, respectively.

Sampling started at 1650 EDT. The initial rotameter reading was 105 units. The test lasted for 10 minutes and the final ambient air and well concentrations were recorded and the readings were 2.3 ppm and 16.0 ppm, respectively. The final rotameter reading was 105 units.

**- SAMPLE 2-1M31**

Sample 2-1M31 was collected from well M31 which was a 30" deep well located west of the landfill. Pump #1 and sample unit #5 were used for this sampling with a nominal flowrate and volume of 1.0 Lpm and 10 liters. The well was evacuated for 30 seconds prior to sampling. The initial ambient air and well VOC concentrations were recorded and the readings were 2.6 ppm and 5.0 ppm, respectively. A leak check was performed on all connections.

Sampling started at 1746 EDT with an initial rotameter reading of 105 units. The sampling ended at 1756 EDT, as scheduled. The final rotameter reading was 105 units. Final ambient air concentration was 2.4 ppm, and the final well concentration was 4.5 ppm.

**- SAMPLE 2-1M28**

Sample 2-1M28 was collected from the 30" deep well M28 located north of the recharge basin, just within the western landfill property line. Pump #1 and sampler unit #5 were used for sampling. The nominal flowrate and sample volume were 1.0 Lpm and 10 liters. The initial ambient VOC concentration was measured and the reading was 2.3 ppm. The initial well VOC concentration was taken next and the reading was 100.0 ppm. A leak check was performed.

Sampling started at 1810 EDT with an initial rotameter reading of 105 units. The sampling stopped at 1820 EDT, as scheduled. The final rotameter reading was 105 units. The final ambient air VOC concentration was measured at 2.3 ppm and the final well VOC concentration was measured at 85.0 ppm.

**- SAMPLE 2-1M22**

Sample 2-1M22 was collected from a 30" deep well M22 located north of the landfill. Pump #1 and sampler unit #5 were used. The well was evacuated for 30 seconds prior to sampling. A leak check was performed to check the line connection. Initial ambient air and well VOC concentrations were measured at 2.3 ppm and 45.0 ppm, respectively.

The sampling started at 1837 EDT and lasted for ten minutes, as scheduled. During sampling the rotameter reading was 105 units. The ambient air and well VOC concentrations were recorded again at the end of sampling and readings were 3.9 ppm and 9.4 ppm, respectively.

**- SAMPLE 2-1M39**

Sample 2-1M39 was collected from M39, a 30" deep well located north of the air stripper, next to a telephone pole. Pump #1 and sampler unit #5 were used. The nominal flowrate and sample volume were 1.0 Lpm and 10 liters, respectively. The well was evacuated for 30 seconds prior to the sampling and a leak check was performed. The initial ambient air and well concentrations were 2.9 ppm and 4.9 ppm, respectively.

The sampling started at 1902 EDT and finished at 1912 EDT. The rotameter remained at 105 units during the entire sampling period. The final ambient air and well VOC concentrations were 3.1 ppm and 22.8 ppm, respectively.

**- SAMPLE 2-1M34**

Sample 2-1M34 was collected from M34, a 30" deep well located southwest of the landfill on the west side of the haul road. Pump #1 and sampler unit #5 were used. The nominal flowrate was 1.0 Lpm, the nominal sample volume was 10 liters. The ambient air VOC concentration was measured before sampling and the reading was 4.6 ppm. The well was evacuated for 30 seconds prior to sampling. The initial well VOC concentration was 47.0 ppm.

Sampling started at 1925 EDT. The initial rotameter reading was 105 units. Sampling ended at 1935 EDT. The final rotameter reading was 105 units. Final ambient air and well VOC concentrations were 3.7 ppm and 28.0 ppm, respectively.

**- SAMPLE 2-1M37**

Sample 2-1M37 was collected from M37, a 30" deep well located at the southwest corner of the landfill. The nominal flowrate and sample volume were 1.0 Lpm and 10 liters, respectively. The ambient air VOC concentration was measured before sampling and the reading was 3.1 ppm. The well was evacuated for 30 seconds prior to sampling. The initial well VOC concentration was 23.0 ppm.

Sampling started at 1949 EDT. The initial rotameter reading was 105 units. Sampling ended at 1959 EDT. The final rotameter was 105 units. Final ambient air and well VOC concentrations were 4.2 ppm and 5.5 ppm, respectively.

OCTOBER 27, 1992

- **SAMPLE 2-1FB(A)**

Sample 2-1FB(A) was one of two field blank samples. It was collected at the ambient sampling site A2/A3. The sampling traps were removed from the shipping tubes, trap ends were opened and remained open for about 20 seconds. At the end of sample collection the trap ends were closed, placed back into the shipping tubes and labeled.

- **SAMPLE 2-1FB(B)**

Sample 2-1FB(B) was the second field blank sample collected as a backup field sample. It was collected at the same site as 2-1FB(A). Same field sample collection procedure was applied. The traps were opened to the site atmosphere for about 20 seconds.

- **SAMPLE 2-1TB(A)**

Sample 2-1TB(A) was prepared at the site A4. The sampling traps were taken out of the shipping box with the traps remaining inside the shipping tubes. They were then labeled and put back into the box.

- **SAMPLE 2-1TB(B)**

Sample 2-1TB(B) was prepared as the second trip blank sample. It was prepared at site A2/A3. Again, the sampling traps were taken out of the shipping box with the traps remaining inside the shipping tubes. They were then labeled and put back into the box.

## CHRONOLOGY - WELL PRESSURE READINGS

### OCTOBER 28, 1992

**- PW1**

PW1 was located northwest of the landfill along the haul road. A Dwyer inclined manometer was used for well pressure measurements.

The manometer was leveled, leak checked and zeroed before it was used to measure the well pressure. There were two wells inside PW1. One well was marked with blue color, the other one was marked with green color. Pressure readings from both wells were taken two times to assure the readings were reproduceable. All readings were noted on the datasheet.

**- PW2**

PW2 was located at the southeast corner of the landfill. A Dwyer inclined manometer was used for the pressure measurements.

The manometer was leveled, leak checked and zeroed before pressure reading started. There were two wells inside PW2. One well was marked with blue color, the other one was marked with green color. Pressure readings were taken two times and all readings were recorded on the datasheet.

**- PW3**

PW3 was located south of the landfill inside the Firemans' Training Center. It was also east of the soil gas well F1. Again, a Dwyer inclined manometer was used for the well pressure readings.

The manometer was leveled, leak checked and zeroed as part of the quality assurance procedure. Two wells were located at PW3 and they were marked with blue and green color, respectively. Pressure readings were taken two times for both wells and all readings were recorded on the datasheet.

# APPENDIX D

# ANALYTICAL RESULTS

GRASEBY

NUTECH-RTL

February 5, 1993

Scott Mills
RTP Environmental Associates
400 Post Avenue
Westbury, NY 11590

RE: 92102850 -corrections

Dear Mr. Mills:

Enclosed please find the corrections we discussed of the results of the samples submitted to our laboratory on 10/28/92.

If you have any questions concerning these reports, please contact me at the number listed below.

Sincerely,

GRASEBY NUTECH-RTL

J. Wayne Jones

J. Wayne Jones
Chemist

JWJ

Enclosures

GRASEBY NUTECH-RTL
4022 STIRRUP CREEK DRIVE, SUITE 325, DURHAM, NC 27703-9000, USA
TEL: 919 544 5775 FAX: 919 544 3770

GRASEBY
NUTECH-RTL

**VOST GC/MS REPORT**

prepared for

## RTP ENVIRONMENTAL SERVICES

by

**GRASEBY NUTECH-RTL**

2/5/93

J. Wayne Jones
Chemist

Thomas G. Conally
Laboratory Manager

RTL ID # 92102850

November 30, 1992

GRASEBY NUTECH-RTL
4022 STIRRUP CREEK DRIVE, SUITE 325, DURHAM, NC 27703-9000, USA
TEL: 919 544 5775 FAX: 919 544 3770

# INTRODUCTION

**Scope:**

To analyze (VOST) Tenax/Charcoal cartridges for the custom target compound list (TCL) and tentatively identify five custom compounds and the next six non-target compounds (TIC) by Desorb-Purge-Trap-Desorb Gas Chromatography/Mass Spectrometry (DPTD GC/MS).

**Method Summary:**

Sample cartridges are analyzed by desorb-purge-trap-desorb gas chromatography/mass spectrometry (DPTD GC/MS). Daily analytical checks are performed on cartridge blanks and reagent water. The daily GC/MS performance test required for this method is described in SW 846, Method 8240. Th35X and samples

are spiked with a known amount of BFB to maintain a constant check of system performance.

**Sample Desorption:**

The DPTD GC/MS procedures are those described in SW 846 Method 5040. The spiked sample cartridge is placed in the thermal desorption apparatus (Nutech 8533) and desorbed in the VOST system by heat to 200 °C for 10 minutes. Consideration is given for individual analysis of cartridges. The desorbed components then pass into the bottom of the water column, are purged from the water and collected on the internal analytical sorbent trap. After the 10-minute desorption period, the compounds are desorbed from the analytical trap into the GC/MS system.

**Calculations:**

All compounds detected that coincide with those of the Target Compound List (TCL) are calculated using equation #1 and response factors derived from in-house standards. All tentatively identified compounds are calculated, using equation #2 and a standard TIC response factor of one (1.0). Compounds quantified by equation #2 are qualified as being estimates.

*Eqn #1:* $$[X] = \frac{A_X \cdot [IS]}{A_{IS} \cdot RF}$$

*Eqn #2:* $$[X] = \frac{A_X \cdot [IS]}{A_{IS} \cdot 1.0}$$

*Where:*
$[X]$ = amount of compound, ng
$[IS]$ = amount of internal standard, ng
$A_X$ = response of compound
$A_{IS}$ = response of internal standard
$RF$ = response factor

# ANALYTICAL CONDITIONS

**Equipment:**

HP 5970 GC/MSD tuned to BFB criteria

**GC Conditions:**

| | | | |
|---|---|---|---|
| Temp 1 | : | 0 | °C |
| Time 1 | : | 4.0 | minutes |
| Ramp Rate | : | 6.0 | °C/minute |
| Temp 2 | : | 160 | °C |
| Time 2 | : | 5.0 | minutes |

**Column:**

VOCOL (Supelco),
Length 60 m,
Film thickness 1.5 $\mu$m,
Internal diameter 0.75 mm,
Construction of Borosilicate glass
with fused silica ends

**Mass Spectrometer Conditions:**

| | | |
|---|---|---|
| Run Time | : | 25 minutes |
| Scan Range | : | 35 - 260 AMU |
| Scan Delay | : | 1.90 minutes |
| Ion Source Temp | : | 200 °C |
| Electron Multiplier | : | 2700 ± 200 EV |
| Separator Temp | : | 225 °C |

**Sample Chronicle:**

| | |
|---|---|
| Client | RTP Environmental Services |
| RTL Project ID | 92102850 |
| Analysis Type | VOST Tenax/charcoal |
| Date of Collection | not supplied |
| Date Received | 10/28/92 |
| Date Authorized | 10/28/92 |
| Date Analyzed | 11/17/92 - 11/23/92 |
| Date Reported | 11/30/92 |

**Narrative:**

The details of the letter dated 11/4/92 were followed with consideration given for split ratios and individual analysis of specified sample pairs.

Several notable occurrences were observed and noted below and on each sample report.

- The preliminary samples resulted with high levels of primarily carbon dioxide. A "shallow" scan delay of approximately 1.96 minutes was recommended to prevent MS saturation and run abortion. The delay was an attempt to maintain significant data if available for vinyl chloride. The effect on chloromethane and vinyl chloride was reported to RTP.

- Splitting was determined not necessary because all target compounds detected were within the quantitation range.

- Sample 2-1M28 (92102850-12/T1073) was inadvertently analyzed with a split. All significant compounds detected will be reported and noted if BQL. All QC measures were within expected ranges.

The laboratory remains available to assist with questions concerning these reports or sampling procedures.

## REFERENCES


Federal Register, 44, 69464, December 3, 1979

Protocol for the Collection and Analysis of Volatile POHCs Using VOST, EPA-600/8-84-007 available from ORD Publications, Center for Environmental Research Information, Cincinnati, Ohio 45268

NIOSH Manual of Analytical Methods, HEW Publication No. (NIOSH) 75-121, available from Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402

Supelco Bulletin 769, "Determination of Organic Vapors in the Industrial Atmosphere", 1977: Supelco, Inc., Bellefonte, PA 16823

Test Methods for Evaluation of Solid Waste, SW 846 Methods 0030, 8240, 5040, 5030

Compendium of Methods for the Determination of Toxic Organic Compounds in Air, PB87-168688, Battelle Columbus Laboratories, Columbus, Ohio

# SAMPLE RESULTS

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-23 | File ID: | T1055 |
| Sample ID: | 2-1FB (A) | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 90 |
| Toluene-$d_8$ | 99 |
| 4-Bromofluorobenzene | 86 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-23 | File ID: | T1055 |
| Sample ID: | 2-1FB (A) | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

## GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-23 | File ID: | T1055 |
| Sample ID: | 2-1FB (A) | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Carbon dioxide | 1.81 | 4,500 | 44 |

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-25 | File ID: | T1056 |
| Sample ID: | 2-1TB (A) | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 98 |
| Toluene-$d_8$ | 100 |
| 4-Bromofluorobenzene | 86 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-25 | File ID: | T1056 |
| Sample ID: | 2-1TB (A) | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-25 | File ID: | T1056 |
| Sample ID: | 2-1TB (A) | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Carbon dioxide | 1.81 | 3,500 | 44 |

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-5 | File ID: | T1057 |
| Sample ID: | 2-1M6 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 109 |
| Toluene-$d_8$ | 97 |
| 4-Bromofluorobenzene | 66 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 790 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 240 – 12,000** **BQL: Below Quantitation Limit**

Split ratio: 1:12

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-5 | File ID: | T1057 |
| Sample ID: | 2-1M6 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-5 | File ID: | T1057 |
| Sample ID: | 2-1M6 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Carbon dioxide | 1.68 | >25,000 [d] | 44 |
| Unknown compound | 22.46 | 20 | — |
| Unknown compound | 23.01 | 23 | — |
| Unknown compound | 23.97 | 20 | — |
| Unknown compound | 24.59 | 25 | — |

Split ratio: 1:12
d: See Endnote

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-10 | File ID: | T1058 |
| Sample ID: | 2-1M9 (20) | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 112 |
| Toluene-$d_8$ | 92 |
| 4-Bromofluorobenzene | 58 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 200 – 10,000** **BQL: Below Quantitation Limit**

Split ratio: 1:10

## GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-10 | File ID: | T1058 |
| Sample ID: | 2-1M9 (20) | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-10 | File ID: | T1058 |
| Sample ID: | 2-1M9 (20) | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Carbon dioxide | 1.92 | >24,000 [d] | 44 |

Split ratio: 1:10
d: See Endnotes

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-21 | File ID: | T1059/60 |
| Sample ID: | 2-1A3 [a] | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 98 |
| Toluene-$d_8$ | 99 |
| 4-Bromofluorobenzene | 65 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | a |
| 75-01-4 | Vinyl chloride | a |
| 74-83-9 | Bromomethane | a |
| 75-00-3 | Chloroethane | a |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 320 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | 240 |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | 430 |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | 700 |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | 220 |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | 450 |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 200 – 10,000** **BQL: Below Quantitation Limit**

Split ratio: 1:10
a: See Endnotes

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-21 | File ID: | T1059/60 |
| Sample ID: | 2-1A3 [a] | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

a: See Endnotes

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-21 | File ID: | T1059/60 |
| Sample ID: | 2-1A3 [a] | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 3-Methylpentane | 2.53 | 460 | 86 |
| Unknown compound | 12.51 | 70 | — |
| Unknown compound | 19.32 | 92 | — |
| (1-Methylethyl)benzene | 20.49 | 97 | 120 |
| Unknown compound | 21.93 | 67 | — |
| Unknown compound | 23.04 | 90 | — |

Split Ratio: 1:10
a: See Endnotes

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-14 | File ID: | T1073 |
| Sample ID: | 2-1M28 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 92 |
| Toluene-$d_8$ | 86 |
| 4-Bromofluorobenzene | 57 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | g |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 21 * |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | 21 * |
| 71-55-6 | 1,1,1-Trichloroethane | 29 * |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 180 – 9,000**

**BQL: Below Quantitation Limit**

Split ratio: 1:9
*: See Narrative

Scan delay: 1.96 min.
g: See Endnotes

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-14 | File ID: | T1073 |
| Sample ID: | 2-1M28 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-14 | File ID: | T1073 |
| Sample ID: | 2-1M28 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Carbon dioxide | 2.30 | >15,000 [d] | 44 |
| Unknown compound | 24.25 | 30 | — |

Scan delay: 1.96 min.
d: See Endnotes

Split Ratio: 1:9

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-18 | File ID: | T1074 |
| Sample ID: | 2-1M37 | Description: | Tenax |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 84 |
| Toluene-$d_8$ | 90 |
| 4-Bromofluorobenzene | 71 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 28 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 24 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000**

BQL: **Below Quantitation Limit**

Scan delay: 1.96 min.

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-18 | File ID: | T1074 |
| Sample ID: | 2-1M37 | Description: | Tenax |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-18 | File ID: | T1074 |
| Sample ID: | 2-1M37 | Description: | Tenax |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Carbon Dioxide | 1.82 | 920 | 44 |
| Unknown hydrocarbon | 18.88 | 22 | — |
| 3-Methyl-5-propylnonane | 21.08 | 33 | 184 |
| Unknown hydrocarbon | 21.70 | 33 | — |

Scan delay: 1.96 min.

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-18 | File ID: | T1075 |
| Sample ID: | 2-1M37 | Description: | Tenax/charcoal |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 84 |
| Toluene-$d_8$ | 95 |
| 4-Bromofluorobenzene | 83 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000**

**BQL: Below Quantitation Limit**

Scan delay: 1.96 min.

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-18 | File ID: | T1075 |
| Sample ID: | 2-1M37 | Description: | Tenax/charcoal |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-18 | File ID: | T1075 |
| Sample ID: | 2-1M37 | Description: | Tenax/charcoal |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Carbon dioxide & xenon | 2.49 | 270 | 44/131 |

Scan delay: 1.96 min.

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-1 | File ID: | T1076 |
| Sample ID: | 2-1F1 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 83 |
| Toluene-$d_8$ | 95 |
| 4-Bromofluorobenzene | 83 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | g |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 730 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 29 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | 36 |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000** **BQL: Below Quantitation Limit**

g: See Endnotes

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-1 | File ID: | T1076 |
| Sample ID: | 2-1F1 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-1 | File ID: | T1076 |
| Sample ID: | 2-1F1 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Unknown hydrocarbon | 21.15 | 20 | --- |
| Unknown hydrocarbon | 21.76 | 24 | --- |

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-2 | File ID: | T1077 |
| Sample ID: | 2-1M2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 82 |
| Toluene-$d_8$ | 96 |
| 4-Bromofluorobenzene | 82 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | g |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 110 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | 25 |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000** **BQL: Below Quantitation Limit**

g: See Endnotes Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-2 | File ID: | T1077 |
| Sample ID: | 2-1M2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2,Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-2 | File ID: | T1077 |
| Sample ID: | 2-1M2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Methylbutane | 2.81 | 740 | 72 |

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-3 | File ID: | T1078 |
| Sample ID: | 2-1M4 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 83 |
| Toluene-$d_8$ | 87 |
| 4-Bromofluorobenzene | 76 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | g |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 82 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 39 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000** **BQL: Below Quantitation Limit**

g: See Endnotes

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-3 | File ID: | T1078 |
| Sample ID: | 2-1M4 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2,Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-3 | File ID: | T1078 |
| Sample ID: | 2-1M4 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Unknown compound | 2.69 | 56 | — |

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-4 | File ID: | T1079 |
| Sample ID: | 2-1M5 [b] | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 86 |
| Toluene-$d_8$ | 97 |
| 4-Bromofluorobenzene | 86 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | b |
| 75-01-4 | Vinyl chloride | b |
| 74-83-9 | Bromomethane | b |
| 75-00-3 | Chloroethane | b |
| 75-69-4 | Trichlorofluoromethane | 44 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 30 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | 29 |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000** **BQL: Below Quantitation Limit**

b: See Endnotes

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-4 | File ID: | T1079 |
| Sample ID: | 2-1M5 [b] | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2,Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

b: See Endnotes

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-4 | File ID: | T1079 |
| Sample ID: | 2-1M5 [b] | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2,2,5,5-Tetramethylhexane | 21.68 | 22 | 142 |

Scan delay: 1.96

b: See Endnotes

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-6 | File ID: | T1080 |
| Sample ID: | 2-1M13 [b] | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 84 |
| Toluene-$d_8$ | 95 |
| 4-Bromofluorobenzene | 84 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | b |
| 75-01-4 | Vinyl chloride | b |
| 74-83-9 | Bromomethane | b |
| 75-00-3 | Chloroethane | b |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 33 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | 97 |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000**

**BQL: Below Quantitation Limit**

b: See Endnotes

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-6 | File ID: | T1080 |
| Sample ID: | 2-1M13 [b] | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2,Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

b: See Endnotes

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-6 | File ID: | T1080 |
| Sample ID: | 2-1M13 [b] | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular 1eight (AMU) |
|---|---|---|---|
| | | | |

Comments: No peaks found

Scan delay: 1.96
b: See Endnotes

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-7 | File ID: | T1081 |
| Sample ID: | 2-1M16 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 80 |
| Toluene-$d_8$ | 90 |
| 4-Bromofluorobenzene | 80 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 69 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 36 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | 26 |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000**

**BQL: Below Quantitation Limit**

Scan delay: 1.96

## GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-7 | File ID: | T1081 |
| Sample ID: | 2-1M16 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2,Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-7 | File ID: | T1081 |
| Sample ID: | 2-1M16 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| | | | |

Comments: No peaks found

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-8 | File ID: | T1090 |
| Sample ID: | 2-1M21 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 85 |
| Toluene-$d_8$ | 97 |
| 4-Bromofluorobenzene | 81 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 550 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 27 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000**

**BQL: Below Quantitation Limit**

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-8 | File ID: | T1090 |
| Sample ID: | 2-1M21 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2,Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-8 | File ID: | T1090 |
| Sample ID: | 2-1M21 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Unknown | 12.47 | 20 | — |
| α-Pinene | 18.86 | 76 | 136 |
| Unknown hydrocarbon | 19.55 | 63 | — |
| Limonene | 21.96 | 24 | 136 |

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-9 | File ID: | T1091 |
| Sample ID: | 2-1M9 (10) | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 84 |
| Toluene-$d_8$ | 92 |
| 4-Bromofluorobenzene | 77 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 810 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000**

**BQL: Below Quantitation Limit**

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-9 | File ID: | T1091 |
| Sample ID: | 2-1M9 (10) | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-9 | File ID: | T1091 |
| Sample ID: | 2-1M9 (10) | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| | | | |

Comments: No peaks found

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-11 | File ID: | T1092 |
| Sample ID: | 2-1M9 (30) | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 84 |
| Toluene-$d_8$ | 92 |
| 4-Bromofluorobenzene | 77 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 21 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | 20 |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000**

**BQL: Below Quantitation Limit**

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-11 | File ID: | T1092 |
| Sample ID: | 2-1M9 (30) | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-11 | File ID: | T1092 |
| Sample ID: | 2-1M9 (30) | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| | | | |

Comments: No peaks found

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-12 | File ID: | T1093 |
| Sample ID: | 2-1M9 (40) | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 71 |
| Toluene-$d_8$ | 85 |
| 4-Bromofluorobenzene | 68 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 72 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 39 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | 44 |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | 27 |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000**

**BQL: Below Quantitation Limit**

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-12 | File ID: | T1093 |
| Sample ID: | 2-1M9 (40) | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-12 | File ID: | T1093 |
| Sample ID: | 2-1M9 (40) | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Methylbutane | 2.83 | 530 | 72 |

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-13 | File ID: | T1094 |
| Sample ID: | 2-1M31 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 83 |
| Toluene-$d_8$ | 96 |
| 4-Bromofluorobenzene | 84 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 80 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 25 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000**

**BQL: Below Quantitation Limit**

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-13 | File ID: | T1094 |
| Sample ID: | 2-1M31 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-13 | File ID: | T1094 |
| Sample ID: | 2-1M31 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| | | | |

Comments: No peaks found

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-15 | File ID: | T1095 |
| Sample ID: | 2-1M22 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | c |
| Toluene-$d_8$ | c |
| 4-Bromofluorobenzene | c |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 20 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 33 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | 26 |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | 68 |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | 23 |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 - 1000**

**BQL: Below Quantitation Limit**

c: See Endnotes

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-15 | File ID: | T1095 |
| Sample ID: | 2-1M22 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-15 | File ID: | T1095 |
| Sample ID: | 2-1M22 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Unknown hydrocarbon | 6.20 | 60 | — |
| α pinene | 18.87 | 462 | 136 |

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-16 | File ID: | T1096 |
| Sample ID: | 2-1M39 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 83 |
| Toluene-$d_8$ | 95 |
| 4-Bromofluorobenzene | 79 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 20 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 28 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | 62 |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 - 1000**

**BQL: Below Quantitation Limit**

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-16 | File ID: | T1096 |
| Sample ID: | 2-1M39 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-16 | File ID: | T1096 |
| Sample ID: | 2-1M39 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| α pinene | 18.87 | 220 | 136 |
| 2,2-Dimethyl-3-methylenebicyclo[2.2.1]heptane | 19.49 | 280 | 136 |

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-17 | File ID: | T1097 |
| Sample ID: | 2-1M34 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 89 |
| Toluene-$d_8$ | 95 |
| 4-Bromofluorobenzene | 82 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 25 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 21 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 - 1000**

**BQL: Below Quantitation Limit**

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-17 | File ID: | T1097 |
| Sample ID: | 2-1M34 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-17 | File ID: | T1097 |
| Sample ID: | 2-1M34 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Methylbutane | 2.83 | 580 | 72 |
| Unknown hydrocarbon | 24.71 | 34 | — |

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-19 | File ID: | T1098 |
| Sample ID: | 2-1A1 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 75 |
| Toluene-$d_8$ | 80 |
| 4-Bromofluorobenzene | 91 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | >72 g |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 860 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | 320 |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | 100 |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 1,300 e |
| 56-23-5 | Carbon tetrachloride | 430 |
| 71-43-2 | Benzene | 1,600 e |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | 240 |
| 78-87-5 | 1,2-Dichloropropane | 50 |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | >820 d |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | 1,800 e |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | 830 |
| 1330-20-7 | Xylene (total) | >2,700 d,e |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | 250 |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 - 1000**

**BQL: Below Quantitation Limit**

d,e,g: See Endnotes

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-19 | File ID: | T1098 |
| Sample ID: | 2-1A1 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-19 | File ID: | T1098 |
| Sample ID: | 2-1A1 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Unknown hydrocarbon | 6.20 | 1,300 | — |
| 2-Methylhexane | 8.82 | 930 | 100 |
| 2,5-dimethylhexane | 12.54 | 520 | 114 |
| Unknown ethylmethylbenzene | 20.45 | 2,700 | 120 |
| Unknown substituted benzene | 21.42 | 1,300 | 120 |
| 2,3-Dihydro-1H-indene | 23.07 | 540 | 118 |

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-20 | File ID: | T1099 |
| Sample ID: | 2-1A2 | Description: | Tenax/charcoal |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 79 |
| Toluene-$d_8$ | 81 |
| 4-Bromofluorobenzene | 78 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | >76 g |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 990 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | 470 |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 540 |
| 56-23-5 | Carbon tetrachloride | 150 |
| 71-43-2 | Benzene | 220 |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000** **BQL: Below Quantitation Limit**

g: See Endnotes

Scan delay: 1.96

# GRASEBY RTL

Client: RTP Environmental Services  Received: 10/28/92

RTL ID: 92102850-20  File ID: T1099

Sample ID: 2-1A2  Description: Tenax/charcoal

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-20 | File ID: | T1099 |
| Sample ID: | 2-1A2 | Description: | Tenax/charcoal |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Unknown | 2.69 | 260 | — |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 4.07 | 800 | 186 |
| 2-Methylpentane | 5.03 | 340 | 86 |
| Hexane | 6.20 | 490 | 86 |
| Methylcyclopentane | 7.72 | 190 | 84 |
| Unknown hydrocarbon | 11.98 | 98 | 100 |

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-20 | File ID: | T1100 |
| Sample ID: | 2-1A2 | Description: | Tenax |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 84 |
| Toluene-$d_8$ | 89 |
| 4-Bromofluorobenzene | 90 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 69 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | 75 |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 750 |
| 56-23-5 | Carbon tetrachloride | 280 |
| 71-43-2 | Benzene | 1,500 [e] |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | 210 |
| 78-87-5 | 1,2-Dichloropropane | 51 |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | >860 [d] |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | 1,400 [e] |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | 1,200 [e] |
| 1330-20-7 | Xylene (total) | >1,300 [d] |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | 150 |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000**

**BQL: Below Quantitation Limit**

d,e: See Endnotes

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-20 | File ID: | T1100 |
| Sample ID: | 2-1A2 | Description: | Tenax |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-20 | File ID: | T1100 |
| Sample ID: | 2-1A2 | Description: | Tenax |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 3-Methylpentane | 6.20 | 1,400 | 86 |
| Unknown hydrocarbon | 12.60 | 540 | — |
| 4,6-Dimethylundecane | 20.24 | 880 | 184 |
| Ethylmethylbenzene isomer | 20.45 | 2,600 | 120 |
| Ethylmethylbenzene isomer | 21.14 | 730 | 120 |
| Unknown substituted benzene | 21.42 | 990 | 120 |

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-22 | File ID: | T1101 |
| Sample ID: | 2-1A4 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 74 |
| Toluene-$d_8$ | 72 |
| 4-Bromofluorobenzene | 99 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | >64 [g] |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | 890 |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | 390 |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | 190 |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 1,300 [e] |
| 56-23-5 | Carbon tetrachloride | 420 |
| 71-43-2 | Benzene | 1,600 [e] |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | 230 |
| 78-87-5 | 1,2-Dichloropropane | 49 |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | >740 [d] |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | 1,600 [e] |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | 880 |
| 1330-20-7 | Xylene (total) | 1,500 [d,e] |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | 200 |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1000** **BQL: Below Quantitation Limit**

d,e,f: See Endnotes

Scan delay: 1.96

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-22 | File ID: | T1101 |
| Sample ID: | 2-1A4 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | |
| Chlorotrifluoromethane (Freon 13) | | ND | |
| *cis*-1,2-Dichloroethene | | ND | |
| Benzaldehyde | | ND | |
| Vinyl acetate | | ND | |

ND: not detected

# GRASEBY RTL

| | | | |
|---|---|---|---|
| Client: | RTP Environmental Services | Received: | 10/28/92 |
| RTL ID: | 92102850-22 | File ID: | T1101 |
| Sample ID: | 2-1A4 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Hexane | 6.20 | 1,600 | 86 |
| 2-Methylhexane | 8.82 | 990 | 100 |
| 2-Methylheptane | 12.54 | 460 | 114 |
| Ethylmethylbenzene isomer | 20.45 | 3,300 | 120 |
| Ethylmethylbenzene isomer | 21.14 | 700 | 120 |
| Trimethylbenzene isomer | 21.42 | 1,500 | 120 |

Scan delay: 1.96

**Endnotes:**

a: The run was aborted by the system because of high levels of primarily carbon dioxide. We immediately restarted the instrument and obtained a complete chromatogram for the remainder of the run. Early eluting targets were not detectable because of the problem. The internal standards, however, did recover within expected QA ranges and a scan delay of 1.96 minutes was instituted on all remaining samples.

b: GC oven temperature had not reached equilibrium at the time of injection. Early eluting compounds were not detected because of the problem.

c: Due to operator error no surrogates were injected. Internal standards recovered well within QC limits and there were no unusual occurrences during the run. All data is considered reliable and accurate.

d: Due to high levels of this compound, detector saturation occurred during its elution. The actual amount of the compound in this sample is higher. Data dropout is a precursor to MS shutdown and run abortion.

e: This amount is beyond the established calibration range. Linearity should not be assumed for results which greatly exceed our calibration range.

g: Compound data could have been obscured due to coelution with a high level saturating peak. Reference "a" above.

# APPENDIX E

# FIELD DATA FORMS

# AMBIENT AIR SAMPLING DATA SHEET

PROJECT ID LKBOBL2 LOCATION Battle Row Campground/OBSWDC

DATE 10/26/97 JULIAN DAY 299

INVESTIGATORS ~~[illegible]~~/~~[illegible]~~/JW

GENERAL WEATHER CONDITIONS Sunny, NW @ 8 mph

TIME SEQUENCE Continuous

SAMPLE ID 2-1 A1 (night) 871B Temp 871B-T/C SAMPLER ID 1 (2 as marked on cooler)

PUMP ID B SAMPLE LOCATION upwind (Battle Row Camp)

NOMINAL FLOW RATE 0.7 lpm NOMINAL SAMPLE VOLUME 1000 l

INITIAL AMBIENT OVA READING 0.000 ppm LEAK CHECK RESULTS ~~[illegible]~~ ok

INITIAL ROTAMETER READING 85 SAMPLE START TIME ~~1030~~ 1031 EDT

| ROTAMETER READING | TOTAL ELAPSE TIME | EASTERN TIME | ROTAMETER READING | TOTAL ELAPSE TIME | EASTERN TIME |
|---|---|---|---|---|---|
| westerly 10-15 MPH 90 ~~88~~ | 167 ~~242~~ | 1318 ~~1305~~ | 89 | 0906 | 0138 |
| 88 | 408 | 1720 | ~~86~~ | ~~0~~ | ~~0~~ |
| ~~94~~ | ~~0507~~ | ~~1725~~ | 87 | 1210 | 0642 |
| ~~88~~ 90 89 | ~~0508~~ 0670 | ~~1726~~ 2142 | 92 | 1408 | 0959 |

SAMPLE STOP TIME 1031E TOTAL ELAPSE TIME 1440 FINAL AMBIENT OVA READING .4 PPM

COMMENTS: AMBIENT WIND CONDITIONS MED-HIGH GUSTS MAY AFFECT ROTAMETER READINGS OFF 1031E

MIN 52°F MAX 52°F

# AMBIENT AIR SAMPLING DATA SHEET

PROJECT ID: 1KBOBL2
LOCATION: Old Bethpage Landfill

DATE: Oct. 26, 92
JULIAN DAY: 299

INVESTIGATORS: SM JW

GENERAL WEATHER CONDITIONS: Sunny. NW @ 15 mph

TIME SEQUENCE: Continuous

SAMPLE ID: ~~2~~A 2 (high) 882D (T). front 871B (T/C). back
SAMPLER ID: 2 (marked 4 on cooler)

PUMP ID: C (high flow pump)
SAMPLE LOCATION: W of Landfill SE of MS on wooden bridge

NOMINAL FLOW RATE: 0.7 lpm
NOMINAL SAMPLE VOLUME: 1000l

INITIAL AMBIENT OVA READING: 0.0 ppm
LEAK CHECK RESULTS: OK

INITIAL ROTAMETER READING: ~~84~~ 85 (bottom of ball)
SAMPLE START TIME: 9:45 EDT (0948?)

| ROTAMETER READING | TOTAL ELAPSE TIME | EASTERN TIME | ROTAMETER READING | TOTAL ELAPSE TIME | EASTERN TIME |
|---|---|---|---|---|---|
| ~~1145~~ | 117 | 1145 | 87 | 0705 | 2133 |
| 88 | 204 | 1311 | 85 | 0939 | 0127 |
| 88 | 0332 | 1521 | 85 | 1245 ~~56~~ | 0633 |
| 88 | 0468 | 1736 | 90 | 1421 | 0929 |

3lb/wd ↓ cw

SAMPLE STOP TIME: 0948
TOTAL ELAPSE TIME: 1440
FINAL AMBIENT OVA READING: 0.0 ppm

COMMENTS: smell odor when setting up A2 & A3. Wind flag shows NW @ start time.

OFF 0948

Check max/min Thermometer at the end of testing ⇒ max = 50°F min = 50°F

Someone was cutting grass around the site area while taking A2 and A3 down

# AMBIENT AIR SAMPLING DATA SHEET

PROJECT ID: LKB0BL2 | LOCATION: The Bethlehem landfill

DATE: Oct. 26, 92 (monday) | JULIAN DAY: 299

INVESTIGATORS: SM JW

GENERAL WEATHER CONDITIONS: Sunny NW @ 15 mph

TIME SEQUENCE: Continuous

SAMPLE ID: 2-1A3 — 382D(T), front; 871B(T/C), back | SAMPLER ID: 3

PUMP ID: 4 (lowflow pump) | SAMPLE LOCATION: next to A2.

NOMINAL FLOW RATE: 0.75 lpm | NOMINAL SAMPLE VOLUME: 100 l

INITIAL AMBIENT OVA READING: 0.0 ppm | LEAK CHECK RESULTS: OK

INITIAL ROTAMETER READING: 50 (bottom of black ball) | SAMPLE START TIME: 9:45 EDT (0944)

| ROTAMETER READING | TOTAL ELAPSE TIME | EASTERN TIME | ROTAMETER READING | TOTAL ELAPSE TIME | EASTERN TIME |
|---|---|---|---|---|---|
| ~~44~~ 52 (B) | 120 | 1144 | 51 | 0707 | 2132 |
| 52 (B) | 207 | 1310 | 51 | 0941 | 0125 |
| 52 | 334 | 1519 | 51 | 1247 | 0631 |
| 52 | 473 | 1737 | 51 | 1422 | 0926 |

13ur wind SW

SAMPLE STOP TIME: 0944 | TOTAL ELAPSE TIME: 1440 | FINAL AMBIENT OVA READING: 0.0 ppm

COMMENTS: windflag shows NW wind @ start time. smell odor

OFF 0944E

Check max & min thermometer at the end of testing and max = 52°F, min = 34°F

# AMBIENT AIR SAMPLING DATA SHEET

PROJECT ID LKBOBL2

LOCATION Old Bethpage Landfill SW of A.S. Bldg, W of landfill

DATE Oct. 26, 92

JULIAN DAY 299

INVESTIGATORS SM JW

GENERAL WEATHER CONDITIONS Sunny NW wind @ 15 mph

TIME SEQUENCE Continuous

SAMPLE ID 2-1A4 871B (T/C), back 882D (T), front

SAMPLER ID 4

PUMP ID D, high flow

SAMPLE LOCATION 50' from BLDG corner. SW of A.S. BLDG, W of landfill

NOMINAL FLOW RATE 0.7 l/m

NOMINAL SAMPLE VOLUME 1000 l

INITIAL AMBIENT OVA READING 1.4 1.5 ppm

LEAK CHECK RESULTS OK

INITIAL ROTAMETER READING 85 (bottom of rotameter)

SAMPLE START TIME 0858 EDT ~~0900 EDT~~ MB

| ROTAMETER READING | | TOTAL ELAPSE TIME | | EASTERN TIME | | ROTAMETER READING | | TOTAL ELAPSE TIME | | EASTERN TIME | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| wind from East 84 | T C B | 247 | T C B | 1305 | T C B | 86 | T C B | 982 | T C B | 0121 | T C B |
| 94 | T C B | 376 | T C B | 1514 | T C B | 86 | T C B | 1288 | T C B | 0626 | T C B |
| 94 86 | T C B | 0507 0508 | T C B | 1725 1726 | T C B | 84 | T C B | 1429 | T C B | 0847 | T C B |
| 88 | T C B | 0749 | T C B | 2128 | T C B | | T C B | 1440 | T C B | 0858 | T C B |

SAMPLE STOP TIME 0858E

TOTAL ELAPSE TIME 1440

FINAL AMBIENT OVA READING 0.0 ppm

COMMENTS: Wind flag indicate WNW @ sampling location at 9:03 EDT.

OFF 0858E 27 oct

ck Max & Min Thermometer at the end of Test Max = Min = 52°F

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID 2CB0BL2 LOCATION Old Bethpage Landfill DATE 10/26/92

INVESTIGATORS Sin JLV

GENERAL WEATHER CONDITIONS Sunny, NW, 10 mph

SAMPLE ID 2-1F1 871C (T/C) 882C (T)

SAMPLER ID 5

PUMP ID 1

SAMPLE LOCATION F1, Fireman's Training Center

WELL ID F1

WELL DEPTH 30"

NOMINAL FLOW RATE ~10 lpm (RR=115)

NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 0.0 ppm

INITIAL WELL VOC READING 0.9 ppm w/ inlet line connected

INITIAL INLET LINE VOC READING 0.0 ppm

SAMPLE START TIME 1135 EDT, restart @ 1136 EDT

INITIAL ROTAMETER READING ~~115~~ ~~110~~ 105 (READ FROM T C B)

Leak check OK.

FINAL AMBIENT VOC READING 0.0 ppm

FINAL WELL VOC READING 2.5 ppm

SAMPLE STOP TIME 1146 EDT

DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: pump stopped 20' after the start time, restarted again with lower flowrate (from 110 to 105).

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKBOTBL2 LOCATION old Bethpage Landfill DATE oct. 26, 92 (Monday)

INVESTIGATORS SM JW

GENERAL WEATHER CONDITIONS Sunny NW @ 10

SAMPLE ID 2-1M2 871C (T/C) 882C (T)

SAMPLER ID 5

PUMP ID 1

SAMPLE LOCATION near Landfill Property fence on S. of the door west side of winding road.

WELL ID M2

WELL DEPTH 30"

NOMINAL FLOW RATE 1 lpm

NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 0.0 ppm

INITIAL WELL VOC READING stabled @ 0.8 ppm, once up to 2.5 ppm

INITIAL INLET LINE VOC READING 0.0 ppm

SAMPLE START TIME 1203 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 0.0 ppm

FINAL WELL VOC READING 0.0 ppm

SAMPLE STOP TIME 1213 EDT

DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: leak ck ok.

## SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKBOBL2 LOCATION old Bethpage Landfill DATE Oct. 26, 92 (Monday)

INVESTIGATORS SM TW MB

GENERAL WEATHER CONDITIONS Sunny NW @ 8 mph

SAMPLE ID 2-M4 875A (T/c) 882C (T)

SAMPLER ID 5

PUMP ID 1

SAMPLE LOCATION E side of Winding road In front of the fence @ the 3rd fence post from Nors

WELL ID M4

WELL DEPTH 30"

NOMINAL FLOW RATE 1 lpm

NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 0.0 ppm

INITIAL WELL VOC READING 0.0 ppm

INITIAL INLET LINE VOC READING 0.0 ppm

SAMPLE START TIME 1224 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 0.0 ppm

FINAL WELL VOC READING 0.0 ppm

SAMPLE STOP TIME 1234 EDT

DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: leak ck. OK

## SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKBCBL2 LOCATION Old Bethpage Landfill DATE Oct. 26, 92 (Mon)

INVESTIGATORS SM JW

GENERAL WEATHER CONDITIONS Sunny, NW @ 10 mph

SAMPLE ID 2-1M5 871C (T/C) 882D (T)

SAMPLER ID 5

PUMP ID 1

SAMPLE LOCATION N. of winding road, next to a sewer vent. Cross the street and bit N of M6.

WELL ID M5

WELL DEPTH 30"

NOMINAL FLOW RATE 1 lpm

NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 0.0 ppm

INITIAL WELL VOC READING 0.0 ppm

INITIAL INLET LINE VOC READING 0.0 ppm

SAMPLE START TIME 1247 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 0.0

FINAL WELL VOC READING 5.6 ppm

SAMPLE STOP TIME 1257 EDT

DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak ck. OK

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKBUBL LOCATION old Bethpage Landfill DATE Oct. 26, 92 (Monday)

INVESTIGATORS SM JW

GENERAL WEATHER CONDITIONS Sunny NW @ 8 mph

SAMPLE ID 2-1M6 871C (T/C) 832D (T)

SAMPLER ID 5

PUMP ID 1

SAMPLE LOCATION ~60' N of the fence around M4 on E side of Winding road

WELL ID M6

WELL DEPTH 30"

NOMINAL FLOW RATE 1 lpm

NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 0.0

☆ INITIAL WELL VOC READING up to 56 ppm, go back to 35 ppm

INITIAL INLET LINE VOC READING new line

SAMPLE START TIME 1356 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 0.8 ppm

FINAL WELL VOC READING 18.0 ppm

SAMPLE STOP TIME 1406 EDT

DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak Ck. OK.

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKBCBL2 LOCATION old Bethpage Landfill DATE Oct. 26, 92

INVESTIGATORS SM FW

GENERAL WEATHER CONDITIONS Partly Sunny NW to 15 mph

SAMPLE ID 2-1M13 882C(T) 371C(T/C) SAMPLER ID 5

PUMP ID 1 SAMPLE LOCATION E side of winding road ~~corner of cross road on winding road~~

WELL ID M13 WELL DEPTH 30"

NOMINAL FLOW RATE 1 lpm NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 0.5 ppm ± INITIAL WELL VOC READING 2.9 ppm ±

INITIAL INLET LINE VOC READING 0.8 ppm ± SAMPLE START TIME 1440 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 1.2 ppm FINAL WELL VOC READING 3.9 ppm

SAMPLE STOP TIME 1450 EDT DURATION 10 min

FINAL ROTAMETER READING ______ (READ FROM T C B)

COMMENTS: Photovac reading dumps up & down.

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKBOBL2 LOCATION Old Bethpage Landfill DATE Oct. ~~29~~ 26, 92

INVESTIGATORS SM MT

GENERAL WEATHER CONDITIONS partly sunny NW @ 15 mph

SAMPLE ID 2-1M16 882D (T) 875A (T/C) SAMPLER ID 5

PUMP ID 1 SAMPLE LOCATION N side of winding road.

WELL ID M16 WELL DEPTH 30"

NOMINAL FLOW RATE 1 lpm NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 0.9 ppm INITIAL WELL VOC READING 4.0 ppm

INITIAL INLET LINE VOC READING 0.9 ppm (connect to amb) SAMPLE START TIME 1503 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 1.2 ppm FINAL WELL VOC READING 13.1 ppm

SAMPLE STOP TIME 1513 EDT DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak ck. OK change to use clean connecting lines before testing M16. stainless steel is 20" down the well

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKB-BLZ LOCATION Old Bethpage Landfill DATE Oct. 26, 92

INVESTIGATORS SM JW MB

GENERAL WEATHER CONDITIONS Cloudy SW @ 10mph

SAMPLE ID 2-1M21 871C 882D

SAMPLER ID 5

PUMP ID 1

SAMPLE LOCATION W. side of Winding Road Cross section of Winding & Mooney rd

WELL ID M21

WELL DEPTH 30"

NOMINAL FLOW RATE 1 lpm

NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 1.0 ppm

INITIAL WELL VOC READING 9.4 ppm

INITIAL INLET LINE VOC READING —

SAMPLE START TIME 1528 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 1.5 ppm

FINAL WELL VOC READING 12.4 PPm

SAMPLE STOP TIME 1538 EDT

DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak ck. OK 19" down the well, if more get wet.

55-58°F = range of Oct.26 cooler temp. from (11:30 – 3:10 pm)

pump with photovac for 30" bef testing and taking initial well samples for all 30" wells.

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKBOBL2 LOCATION old Bethpage Landfill DATE Oct. 26, 92

INVESTIGATORS SM JW MB

GENERAL WEATHER CONDITIONS Sunny NW @ 10mph ~ 15 mph

SAMPLE ID 2-1M9(10'), blue 882D(T) 875A(T/C) SAMPLER ID 5

PUMP ID 1 SAMPLE LOCATION deep well, east of ~~main~~ road.

WELL ID M9 (10') WELL DEPTH 10'

NOMINAL FLOW RATE 1 lpm NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 2.1 ppm INITIAL WELL VOC READING 8.5 ppm

INITIAL INLET LINE VOC READING / SAMPLE START TIME 1602 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 1.8 ppm FINAL WELL VOC READING 19 ppm

SAMPLE STOP TIME 1612 EDT DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak ck. OK, condition (pump) well before reading initial well reading for 1 min 30".

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKBOBLE LOCATION Old Bethpage Landfill DATE Oct. 26, 92

INVESTIGATORS JM JW MB

GENERAL WEATHER CONDITIONS Sunny NW @ 15 mph

SAMPLE ID 2-1M9 (20') ~~Green~~ 882C (T) 878B (T/C) SAMPLER ID 5

PUMP ID 1 SAMPLE LOCATION E. of W. Road.

WELL ID M9 (20') WELL DEPTH 20'

NOMINAL FLOW RATE 1 lpm NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 2.2 ppm INITIAL WELL VOC READING 54 ppm

INITIAL INLET LINE VOC READING — SAMPLE START TIME 1618 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 2.0 ppm FINAL WELL VOC READING ~~54~~ 9.4 ppm

SAMPLE STOP TIME 1628 EDT DURATION 10 min.

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak Ck. OK

pump 3' bef sampling.

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKB9BL2 LOCATION old Bethpage Landfill DATE Oct. 26, 92

INVESTIGATORS MB TM MB

GENERAL WEATHER CONDITIONS partly sunny, SW 5 mph

SAMPLE ID 2-1M9 (30) 882C (T) 371B (T/C) SAMPLER ID 5

PUMP ID 1 SAMPLE LOCATION M9

WELL ID M9 (30') red WELL DEPTH 30'

NOMINAL FLOW RATE 1 lpm NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 1.9 PPm INITIAL WELL VOC READING 4.4 ppm

INITIAL INLET LINE VOC READING ✓ SAMPLE START TIME 1635 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 2.0 ppm FINAL WELL VOC READING 9.0 ppm

SAMPLE STOP TIME 1645 EDT DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak ck.

pump well for 4'30" ~~bef~~ start.

## SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKBOBL2 LOCATION Old Bethpage Landfill DATE Oct. 26, 92

INVESTIGATORS SM JW

GENERAL WEATHER CONDITIONS Sunny (partly), SW @ 5 mph

SAMPLE ID 2-1M9(40) 882C(T) 871B(T/C) SAMPLER ID 5

PUMP ID 1 SAMPLE LOCATION M9

WELL ID M9(40) WELL DEPTH 40'

NOMINAL FLOW RATE 1 lpm NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 2.1 ppm INITIAL WELL VOC READING 9.1 PPm

INITIAL INLET LINE VOC READING 6.0 ppm SAMPLE START TIME 1650 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 2.3 ppm FINAL WELL VOC READING 16.0 ppm

SAMPLE STOP TIME 1700 EDT DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak ck. OK

pump 6' bef. Start.

when conditioning the deep wells with SKC pump noted the damp

inside tygon tubing connected to pump.

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKBEBL2 LOCATION Old Bethpage land fill DATE Oct. 26, 92

INVESTIGATORS SW JW

GENERAL WEATHER CONDITIONS cloudy SW@5 mph

SAMPLE ID 2-1 M31 882D (T) 871C (T/C)

SAMPLER ID 5

PUMP ID 1

SAMPLE LOCATION SW of the landfill in bushes

WELL ID M31

WELL DEPTH 30''

NOMINAL FLOW RATE 1 lpm

NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 2.6 ppm

INITIAL WELL VOC READING 5.0 ppm

INITIAL INLET LINE VOC READING /

SAMPLE START TIME 1746 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 2.4 PPm.

FINAL WELL VOC READING 4.5 ppm

SAMPLE STOP TIME 1756 EDT

DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak Ck. OK.

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKB0522 LOCATION old Bethpage Landfill DATE Oct. 26, 92

INVESTIGATORS Sm FW

GENERAL WEATHER CONDITIONS Partly Sunny SW @ 5

SAMPLE ID 2-1M28 882D (T) 875 A (T/C) SAMPLER ID 5

PUMP ID 1 SAMPLE LOCATION W of recharge basin

WELL ID M28 WELL DEPTH 30"

NOMINAL FLOW RATE 1 lpm NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 2.3 ppm

INITIAL WELL VOC READING up to 100 ppm, stopped @ 100 ppm.

INITIAL INLET LINE VOC READING /

SAMPLE START TIME 1810 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 2.3 ppm

FINAL WELL VOC READING 85 ppm

SAMPLE STOP TIME 1820 EDT

DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak Ck. OK

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LSBOBL2 LOCATION Old Bethpage Landfill DATE Oct. 26, 92

INVESTIGATORS ↑

GENERAL WEATHER CONDITIONS (5m / m-) Sunny

SAMPLE ID 2-1M22 (T/C) 87113 (T) 8820 SAMPLER ID 5

PUMP ID 1 SAMPLE LOCATION Cross the road of trailer parking on N.W. of Landfill

WELL ID M22 WELL DEPTH 30"

NOMINAL FLOW RATE 1 lpm NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 2.3 ppm INITIAL WELL VOC READING 45.0 ± ppm

INITIAL INLET LINE VOC READING / SAMPLE START TIME 1837 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING ~~2.3 ppm~~ 3.9 ppm FINAL WELL VOC READING ~~85 ppm~~ 9.4 ppm

SAMPLE STOP TIME 1847 EDT DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak Ck. OK

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LIGBPRL2 LOCATION Old Bethpage Landfill DATE Oct. 26, 92

INVESTIGATORS 1

GENERAL WEATHER CONDITIONS (80 ' 70) Sunny

SAMPLE ID 2-1M39 (T) 882C (T/C) 875A

SAMPLER ID 5

PUMP ID 1

SAMPLE LOCATION N. A.S. BLDG.

WELL ID M39

WELL DEPTH 30"

NOMINAL FLOW RATE 1 lpm

NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 2.9 ppm

INITIAL WELL VOC READING 4.9 ppm

INITIAL INLET LINE VOC READING /

SAMPLE START TIME 1902 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING ~~8~~ 3.1 ppm

FINAL WELL VOC READING ~~9.4~~ 22.8 ppm

SAMPLE STOP TIME 1912 EDT

DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak Ck. OK

SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID UKBPBL LOCATION Buster Bean Landfill DATE Oct 26, 92

INVESTIGATORS Sm JW

GENERAL WEATHER CONDITIONS

SAMPLE ID 2-1M34 882C (T) 875A (T/C)

SAMPLER ID 5

PUMP ID 1

SAMPLE LOCATION ~~between the fence~~ By main road near trailers

WELL ID M34

WELL DEPTH 30"

NOMINAL FLOW RATE 1 lpm

NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 4.6 ppm

INITIAL WELL VOC READING 47 ppm

INITIAL INLET LINE VOC READING

SAMPLE START TIME 1925 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 3.7 ppm

FINAL WELL VOC READING 28± ppm

SAMPLE STOP TIME 1935 EDT

DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak ck. ok

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKB0BZ 2 LOCATION old Bethpage landfill DATE Oct. 26, 92

INVESTIGATORS SM MW

GENERAL WEATHER CONDITIONS

SAMPLE ID 2-1 M37 882C (T) 871C (T/C)

SAMPLER ID 5

PUMP ID 1

SAMPLE LOCATION behind the pond

WELL ID M37

WELL DEPTH 30"

NOMINAL FLOW RATE 1 lpm

NOMINAL SAMPLE VOLUME 10 l

INITIAL AMBIENT VOC READING 3.1 ppm

INITIAL WELL VOC READING 23± ppm

INITIAL INLET LINE VOC READING /

SAMPLE START TIME 1949 EDT

INITIAL ROTAMETER READING 105 (READ FROM T C B)

FINAL AMBIENT VOC READING 4.2

FINAL WELL VOC READING 5.5

SAMPLE STOP TIME 1959 EDT

DURATION 10 min

FINAL ROTAMETER READING 105 (READ FROM T C B)

COMMENTS: Leak Ck OK.

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKB0BL2 LOCATION Old Bethpage Landfill DATE Oct. 27, 92

INVESTIGATORS SM JW

GENERAL WEATHER CONDITIONS Sunny NW @ 5 - 20 mph

SAMPLE ID 2-1 FB (A) 882D (T) 871C (T/C)

SAMPLER ID

PUMP ID

SAMPLE LOCATION Ambient A2 & A3 site

WELL ID

WELL DEPTH

NOMINAL FLOW RATE

NOMINAL SAMPLE VOLUME

INITIAL AMBIENT VOC READING

INITIAL WELL VOC READING

INITIAL INLET LINE VOC READING

SAMPLE START TIME

INITIAL ROTAMETER READING (READ FROM T C B )

FINAL AMBIENT VOC READING

FINAL WELL VOC READING

SAMPLE STOP TIME

DURATION

FINAL ROTAMETER READING (READ FROM T C B )

COMMENTS: open the traps to atmosphere for 30", label and pack

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKBCBL2 LOCATION Old Bethpage Landfill DATE Oct. 27, 92

INVESTIGATORS

GENERAL WEATHER CONDITIONS Sunny, NW @ 8-20 mph

SAMPLE ID 2-1 FB (B) 882D (T) 871C (T/C)

SAMPLER ID /

PUMP ID /

SAMPLE LOCATION ambient A2 & A3 site

WELL ID /

WELL DEPTH /

NOMINAL FLOW RATE /

NOMINAL SAMPLE VOLUME /

INITIAL AMBIENT VOC READING /

INITIAL WELL VOC READING /

INITIAL INLET LINE VOC READING /

SAMPLE START TIME /

INITIAL ROTAMETER READING / (READ FROM T C B )

FINAL AMBIENT VOC READING /

FINAL WELL VOC READING /

SAMPLE STOP TIME /

DURATION /

FINAL ROTAMETER READING / (READ FROM T C B )

COMMENTS: smell horses while taking this field blank sample.

## SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID LKBOBL LOCATION Old Bethpage Landfill DATE Oct. 27, 92

INVESTIGATORS gm JM

GENERAL WEATHER CONDITIONS Sunny NW @ 8-15 mph

SAMPLE ID 2-1 TB (A) 882D (T) 871B (T/c) SAMPLER ID /

PUMP ID / SAMPLE LOCATION ambient Sample A4

WELL ID / WELL DEPTH /

NOMINAL FLOW RATE / NOMINAL SAMPLE VOLUME /

INITIAL AMBIENT VOC READING 0.0 ppm INITIAL WELL VOC READING /

INITIAL INLET LINE VOC READING / SAMPLE START TIME /

INITIAL ROTAMETER READING / (READ FROM T C B )

FINAL AMBIENT VOC READING / FINAL WELL VOC READING /

SAMPLE STOP TIME / DURATION /

FINAL ROTAMETER READING / (READ FROM T C B )

COMMENTS: ___

# SOIL GAS WELL SAMPLING DATA SHEET

PROJECT ID 2KB0BL2 LOCATION Old Bethpage Landfill DATE Oct. 27 92

INVESTIGATORS SM JW

GENERAL WEATHER CONDITIONS Sunny, NW @ 8-20 mph

SAMPLE ID 2-1 TB (B) 882D (T) 871C (T/C)

SAMPLER ID ____

PUMP ID ____

SAMPLE LOCATION A2 & A3 site

WELL ID ____

WELL DEPTH ____

NOMINAL FLOW RATE ____

NOMINAL SAMPLE VOLUME ____

INITIAL AMBIENT VOC READING ____

INITIAL WELL VOC READING ____

INITIAL INLET LINE VOC READING ____

SAMPLE START TIME ____

INITIAL ROTAMETER READING ____ (READ FROM T C B)

FINAL AMBIENT VOC READING ____

FINAL WELL VOC READING ____

SAMPLE STOP TIME ____

DURATION ____

FINAL ROTAMETER READING ____ (READ FROM T C B)

COMMENTS: A car drived by while taking this sample.

Oct. 28, 92.  Well Pressure Reading

1. PW2 (SE of the landfill)

Sunny day.  use pitot flow equip.  Leak ck. ok, rezero.

{Green = -0.035 " water    2nd reading on Green = -0.04 " $H_2O$

{Blue = 0.0 " $H_2O$    2nd reading = 0.0 " $H_2O$

2. PW1 ~~Fireman's Training center~~, PW3

Sunny, ~~some training activity~~ leak ck. Till it's ok. zero. level.

{Blue = 0.00 " $H_2O$,    2nd Reading = 0.00 " $H_2O$

{Green = +0.04 " $H_2O$    2nd Reading = +0.04 " $H_2O$

3. PW~~E~~3 ~~NW of the landfill. Pit~~ Fireman's T.C = F9, 1140 EDT.

Sunny, Training activity is going on at one of the structure. leak ck. ok

{Red = -0.11 " $H_2O$,    2nd reading = -0.11 " $H_2O$

{Green = -0.16 " $H_2O$,    2nd reading = -0.11 " $H_2O$

processes: setup → leak ck → zero → level → reading number →
ck. zero again → reading again

# APPENDIX F

# EQUIPMENT CALIBRATIONS

# PUMP CALIBRATION SHEET

| | |
|---|---|
| Project: LK130BL2 | Barometric Pressure, (Pb): 30.096 (in-Hg) |
| Date: 10/21/92 Pre | Temperature, (T): 21.1 (C) |
| Time: 1345 - 1358 | Operator: RSM |

~~Pump ID:~~ 4 w/ Low flow Rotometer Module

BlACK

| Rotameter Reading (Bottom of the Ball) | | | | | |
|---|---|---|---|---|---|
| 56 | 50 | 45 | | | |
| **Sampling Medium** | | | | | |
| T&T/C | T&T/C | T&T/C | | | |
| **Actual Liters Per Minute, ALPM** | | | | | |
| 83.8 | 70.7 | 58.4 | | | |
| 83.7 | 70.4 | 58.4 | | | |
| 83.8 | 70.6 | 58.5 | | | |
| 84.0 | 70.6 | 58.5 | | | |
| 83.7 | 70.6 | 58.5 | | | |
| 83.6 | 70.7 | 58.5 | | | |
| 84.0 | 70.6 | 58.5 | | | |
| 83.8 | 70.6 | 58.4 | | | |
| 83.9 | 70.6 | 58.4 | | | |
| 84.0 | 70.6 | 58.5 | | | |
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| | | | | | |
| **Avg(ALPM)** | | | | | |
| 83.8 | 70.6 | 58.5 | | | |
| **Average Standard Liters Per Minute, Avg(SLPM)** | | | | | |
| | | | | | |

SLPM = ALPM x {[(Pb–Pv)/29.92] x [293/(273+T)]}

C = (5/9) x (F–32)

| Vapor Pressure (Pv) Table | |
|---|---|
| (C) | (in-Hg) |
| 15 | 0.50 |
| 16 | 0.54 |
| 17 | 0.57 |
| 18 | 0.61 |
| 19 | 0.65 |
| 20 | 0.69 |
| 21 | 0.73 |
| 22 | 0.78 |
| 23 | 0.83 |
| 24 | 0.88 |
| 25 | 0.94 |
| 26 | 0.99 |
| 27 | 1.06 |
| 28 | 1.12 |
| 29 | 1.18 |
| 30 | 1.25 |
| 31 | 1.33 |
| 32 | 1.40 |

Remarks:

Remarks: Calibrated w/ full Ambient VOST Train

# PUMP CALIBRATION SHEET

Project: LK30BL2

Date: 10/21/92 Pr

Time: 1500 - 1545

~~Pump ID:~~ High Flow Rotometer

Barometric Pressure, (Pb): 30.096 (in-Hg)

Temperature, (T): 21.1 (C)

Operator: RSM

| Rotameter Reading (Bottom of the Ball) | | | | | 2 |
|---|---|---|---|---|---|
| 80 | 85 | 90 | 105 | 110 | 115 |
| **Sampling Medium** | | | | | |
| TET/C | → | | | | |
| **Actual Liters Per Minute, ALPM** | | | | | |
| .657 | .705 | .743 | .891 | .937 | .982 |
| .659 | .704 | .749 | .893 | .937 | .979 |
| .661 | .705 | .750 | .889 | .936 | .982 |
| .662 | .704 | .750 | .894 | .937 | .982 |
| .662 | .704 | .750 | .887 | .940 | .982 |
| .660 | .704 | .749 | .889 | .941 | .985 |
| .659 | .705 | .749 | .889 | .937 | .984 |
| .660 | .705 | .749 | .891 | .937 | .982 |
| .663 | .703 | .747 | .892 | .937 | .980 |
| .660 | .704 | .749 | .890 | .937 | .982 |
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| | | | | | |
| | | | | | |
| **Avg(ALPM)** | | | | | |
| .660 | .704 | .749 | .891 | .937 | .982 |
| **Average Standard Liters Per Minute, Avg(SLPM)** | | | | | |
| | | | | | |

SLPM = ALPM x {[(Pb-Pv)/29.92] x [293/(273+T)]}

C = (5/9) x (F-32)

| Vapor Pressure (Pv) Table | |
|---|---|
| (C) | (in-Hg) |
| 15 | 0.50 |
| 16 | 0.54 |
| 17 | 0.57 |
| 18 | 0.61 |
| 19 | 0.65 |
| 20 | 0.69 |
| 21 | 0.73 |
| 22 | 0.78 |
| 23 | 0.83 |
| 24 | 0.88 |
| 25 | 0.94 |
| 26 | 0.99 |
| 27 | 1.06 |
| 28 | 1.12 |
| 29 | 1.18 |
| 30 | 1.25 |
| 31 | 1.33 |
| 32 | 1.40 |

Remarks:

Remarks: Cal. w/ full Amb. VOST Train

# PUMP CALIBRATION SHEET

Project: LKB03L2-1 [redacted]
Date: ~~[illegible] 1992~~ Post
Time: 1240 – 1310 EDT
Pump ID: Low Flow RR

Barometric Pressure, (Pb): 30.08 (in-Hg)
Temperature, (T): 21 (F)
Operator: RSM

Low Flow Ambient

Black

| Rotameter Reading (Bottom of the Ball) | | | | | |
|---|---|---|---|---|---|
| 50 | 56 | | | | |
| **Sampling Medium** | | | | | |
| T/TEC | TET/C | | | | |
| **Actual Liters Per Minutes, ALPM** | | | | | |
| 70.5 | 83.7 | | | | |
| 70.6 | 83.7 | | | | |
| 70.6 | 83.7 | | | | |
| 70.6 | 83.5 | | | | |
| 70.6 | 83.7 | | | | |
| 70.7 | 83.7 | | | | |
| 70.7 | 83.6 | | | | |
| 70.6 | 83.7 | | | | |
| 70.6 | 83.9 | | | | |
| 70.6 | 83.7 | | | | |
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| | | | | | |
| **Avg(ALPM)** | | | | | |
| 70.6 | 83.7 | | | | |
| **Average Standard Liters Per Minute, Avg(SLPM)** | | | | | |
| | | | | | |

SLPM = ALPM x {[(Pb–Pv)/29.92] x [293/(273+T)]}
C = (5/9) x (F–32)

| Vapor Pressure (Pv) Table | |
|---|---|
| (C) | (in-Hg) |
| 15 | 0.50 |
| 16 | 0.54 |
| 17 | 0.57 |
| 18 | 0.61 |
| 19 | 0.65 |
| 20 | 0.69 |
| 21 | 0.73 |
| 22 | 0.78 |
| 23 | 0.83 |
| 24 | 0.88 |
| 25 | 0.94 |
| 26 | 0.99 |
| 27 | 1.06 |
| 28 | 1.12 |
| 29 | 1.18 |
| 30 | 1.25 |
| 31 | 1.33 |
| 32 | 1.40 |

Remarks:

Remarks:

# PUMP CALIBRATION SHEET

Project: LK30BL2-1 ~~SP~~

Date: Post ,1992

Time: 1315 – 1400 EDT

Pump ID: high flow RR

Barometric Pressure, (Pb): 30.08 (in–Hg)

Temperature, (T): 21 (F)

Operator: RSm

| Rotameter Reading (Bottom of the Ball) | | | | | |
|---|---|---|---|---|---|
| 85 | 90 | 105 | | | |
| Sampling Medium | | | | | |
| TET/c | TET/c | TET/c | | | |
| Actual Liters Per Minutes, ALPM | | | | | |
| .703 | .75 | .894 | | | |
| .704 | .75 | .894 | | | |
| .704 | .751 | .894 | | | |
| .704 | .751 | .894 | | | |
| .705 | .751 | .896 | | | |
| .705 | .752 | .896 | | | |
| .704 | .752 | .895 | | | |
| .704 | .752 | .895 | | | |
| .704 | .752 | .895 | | | |
| .703 | .752 | .895 | | | |
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Avg(ALPM) | | | | | |
| 0.704 | 0.751 | 0.895 | | | |
| Average Standard Liters Per Minute, Avg(SLPM) | | | | | |
| | | | | | |

$$SLPM = ALPM \times \{[(Pb - Pv)/29.92] \times [293/(273+T)]\}$$

$$C = (5/9) \times (F-32)$$

| Vapor Pressure (Pv) Table | |
|---|---|
| (C) | (In–Hg) |
| 15 | 0.50 |
| 16 | 0.54 |
| 17 | 0.57 |
| 18 | 0.61 |
| 19 | 0.65 |
| 20 | 0.69 |
| 21 | 0.73 |
| 22 | 0.78 |
| 23 | 0.83 |
| 24 | 0.88 |
| 25 | 0.94 |
| 26 | 0.99 |
| 27 | 1.06 |
| 28 | 1.12 |
| 29 | 1.18 |
| 30 | 1.25 |
| 31 | 1.33 |
| 32 | 1.40 |

Remarks:

Remarks:

# APPENDIX G

# METEOROLOGICAL MONITORING DATA

LKB05L —
10/29/92.

Download met data into computer.

① Set up sub dir. under c:/campbell/campnew/LKB1B2

② Download all met data collected in old met SM192. Save useful data under $\boxed{\text{2-1up.dat}}$. It means 2nd year, 1st quarterly test, upwind sampling location met data. All useful data is saved, before next sampling effort, it's OK to delete all data stored in old SM192 if it's necessary.

③ Download all met data collected in new met SM192. Save ~~the~~ useful data under $\boxed{\text{2-1top.dat}}$ meaning 2nd year, 1st quarterly testing met data collected atop of the landfill. Now it's ok to delete data in this SM192 since all useful data has be collected and saved.

④ Add data for 1100 EDT on 10/26/92 in 2-1up.TbL since data starts @ 1030 EDT on 10/26/92. To get data for 1100 EDT, use 1030 & 1045 & 1100 avg.

~~299+1 10.30 5.822~~
~~300 10.45 6.~~

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 299 | 1030 | 5.872 | 280.1 | 31.19 | 48.13 | 44.26 | 29.68 |
| 299 | 1045 | 6.202 | 298.7 | 38.94 | 46.32 | 46.36 | 29.66 |
| 299 | 1100 | 7.130 | 285.0 | 32.28 | 48.06 | 45.32 | 29.67 |
| 299 | 1100 | 6.401 | 281.3 | 34.14 | 47.50 | 45.31 | 29.67 |
| (J.day) | (Time) | (mph) | (WD) | ($\sigma_\theta$) | (F°) | (%) | (in-Hg) |
| +1 | | " | +17° | | | | |
| " | | 2.861 | " | | | | |
| 300 | | (m/s) | 298.3° | | | | |

⑤ Compare avg. data from both atop ~~of~~ the landfill and upwind loca

| | WSP (m/s) | WD | $\sigma_\theta$ (Horizontal) | Temp (F) | RH (%) | P (in-Hg) |
|---|---|---|---|---|---|---|
| upwind | 2.05 | 271 | 29.62 | 50 | 61 | 29.68 |
| top of landfill | 5.12 | 270 | 12.64 | 50 | 51 | 29.46 |

$\Delta = 0.22$ (in-Hg

⑥ Procedure of Data Processing:

Download (*.dat) → Split (*.met) → Lotus (*.TBL)

# METEOROLOGICAL EQUIPMENT SITING DATA SHEET

**Project:** LKBCBL2

**Project Site:** CBSWDC

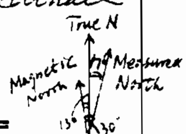
**Operators:** JW SM MB

## Instrument No.1 (old)

**Location:** camping park at upwind high flow ambient air sampling location. This ambient sample is A1, west of Asphalt plant.

**Initial Battery Voltage:** 12.5

**Wind Dir. Reference:** Degree bet. magnetic N and equip N is 30°. Local magnetic angle of declination is about 13°.




**True WD = Measured WD** + (17°) =

**Date & Julian Day to Set Up:** Oct. 26, 1992 (Julian day 299+1 = 300)

**Start Time (Local):** ~10:28

**Date & Julian Day to Take Down:** 10:55 Am on Oct. 27, 1992

**Stop Time (Local):**

**Remarks:** final voltage = 12.48 @ 10[56] Am on Oct. 27, 1992.

Read 5° when vane and tele-tower is in line.

## Instrument No.2 (new)

**Location:** Atop the landfill on northern end area of highest elevation.

**Initial Battery Voltage:** 12.5

**Wind Dir. Reference:** Compass is used. The angle between magnetic North and measured north is zero. So the measured North is 13° west of true North.

**True WD = Measured WD** − (13°) =

**Date & Julian Day to Set Up:** Oct. 23, 1992 (Julian day = 296+1 = 297)

**Start Time (Local):** ~10:20 Am

**Date & Julian Day to Take Down:** Oct. 27, 1992.

**Stop Time (Local):** ~11:40 Am.

**Remarks:** Final Voltage = 11.43 on 1140 on Oct. 27, 1992.

Ck. system on Oct. 26/92 @ 8:01 EDT. The voltage was 12.08.

Meteorological Condition During Testing
(Upwind Sampling Location) Camping Trailer Park

| Julian Day | Hr&Min | W.Sp (m/s) | WD (deg) | Sigma Theta | Temp (F) | RH (%) | Pres (in-Hg) | |
|---|---|---|---|---|---|---|---|---|
| 300 | 1100 | 2.86 | 248 | 34.14 | 48 | 45 | 29.67 | * (see notes on 10/29/92) |
| 300 | 1200 | 3.31 | 289 | 29.69 | 50 | 44 | 29.67 | |
| 300 | 1300 | 3.26 | 287 | 31.26 | 52 | 41 | 29.65 | |
| 300 | 1400 | 3.01 | 268 | 28.92 | 55 | 37 | 29.64 | |
| 300 | 1500 | 3.01 | 267 | 29.21 | 54 | 35 | 29.63 | |
| 300 | 1600 | 2.05 | 247 | 22.39 | 54 | 38 | 29.63 | |
| 300 | 1700 | 1.89 | 245 | 24.93 | 54 | 40 | 29.62 | |
| 300 | 1800 | 2.11 | 243 | 17.90 | 52 | 42 | 29.63 | |
| 300 | 1900 | 2.11 | 239 | 18.79 | 53 | 48 | 29.66 | |
| 300 | 2000 | 2.28 | 232 | 14.98 | 53 | 52 | 29.67 | |
| 300 | 2100 | 1.90 | 228 | 14.00 | 52 | 59 | 29.67 | |
| 300 | 2200 | 1.37 | 227 | 12.82 | 50 | 72 | 29.66 | |
| 300 | 2300 | 1.09 | 233 | 24.43 | 48 | 82 | 29.65 | |
| 300 | 2400 | 0.65 | 272 | 66.63 | 46 | 89 | 29.65 | |
| 301 | 100 | 0.72 | 240 | 50.78 | 45 | 93 | 29.66 | |
| 301 | 200 | 0.98 | 251 | 39.44 | 47 | 88 | 29.66 | |
| 301 | 300 | 1.42 | 279 | 34.36 | 49 | 83 | 29.66 | |
| 301 | 400 | 2.12 | 307 | 31.06 | 50 | 74 | 29.67 | |
| 301 | 500 | 1.79 | 294 | 35.46 | 50 | 70 | 29.70 | |
| 301 | 600 | 1.64 | 298 | 28.74 | 48 | 73 | 29.72 | |
| 301 | 700 | 2.05 | 307 | 29.87 | 47 | 69 | 29.74 | |
| 301 | 800 | 1.60 | 305 | 34.78 | 47 | 68 | 29.79 | |
| 301 | 900 | 2.51 | 311 | 32.28 | 49 | 65 | 29.83 | |
| 301 | 1000 | 3.40 | 348 | 24.00 | 50 | 63 | 29.85 | |
| avg. | | 2.05 | 271 | 29.62 | 50 | 61 | 29.68 | |

*: Data for 1100 EDT is based on average of 1030, 1045 and 1100 EDT.

old

This program down loaded to Storage module 5/21/92 under instruction of [illegible] Adam. (Comp. to SM192). The program will co[illegible] both 15m & 1 hr. data.

```
Program Name:8779A.DOC
Customer:R.T.P. ENVIRONMENTAL, INC.
Climatronics Job No:8779A
Revision/Date:REV 0/ JULY 12, 1989
              REV 1/ AUGUST 22, 1991 REVISED TO 6330
                     EPROM AND P69 INST. FOR WD
              REV 2/ MAY 20, 1992 ADDED 1 HR. AVERAGE

Flag Usage:0 = OUTPUT
Input Channel Usage:
S.E.01 = WIND DIRECTION
S.E.02 = TEMPERATURE
S.E.03 = HUMIDITY
S.E.04 = PRESSURE

Excitation Channel Usage:
E1 = WIND DIRECTION
E2 = TEMPERATURE/HUMIDITY

Control Port Usage:NONE
Pulse Input Channel Usage:
P1 = WIND SPEED
P2 = PRECIPITATION

Output Array Definitions:
01 = EXECUTION LOCATION
02 = JULIAN DATE
03 = TIME (HH:MM)
04 = AVERAGE WIND SPEED (MPH)
05 = AVERAGE WIND DIRECTION (DEGREES)
06 = STANDARD DEVIATION OF WIND DIRECTION (DEGREES)
07 = AVERAGE TEMPERATURE (DEGREES F)
08 = AVERAGE HUMIDITY (PERCENT)
09 = AVERAGE PRESSURE (INCHES/HG)
10 = TOTAL RAINFALL (INCHES)
11 = AVERAGE BATTERY VOLTAGE (VDC)


*      1        Table 1 Programs
  01: 1.0000    Sec. Execution Interval

01:  P3         Pulse                  ***** MEASURE WIND SPEED SENSOR
  01: 1         Rep
  02: 1         Pulse Input Chan
  03: 0         High frequency
  04: 1         Loc [:WINDSPEED]
  05: .14388    Mult
  06: 0.5000    Offset
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L43082C

2-1 Tip. out
10/29/92

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 09+29.76 | 10+0.000 | 11+12.57 | | | | | |
| 01+0109. | 02+0299. | 03+0715. | 04+0.500 | 05+08.47 | 06+0.000 | 07+69.02 | 08+28.81 |
| 09+29.77 | 10+0.000 | 11+12.57 | | | | | |
| 01+0109. | 02+0299. | 03+0730. | 04+0.500 | 05+08.47 | 06+0.099 | 07+68.90 | 08+27.64 |
| 09+29.77 | 10+0.000 | 11+12.57 | | | | | |
| 01+0109. | 02+0299. | 03+0745. | 04+0.500 | 05+08.46 | 06+0.199 | 07+64.77 | 08+24.63 |
| 09+29.77 | 10+0.000 | 11+12.57 | | | | | |
| 01+0109. | 02+0299. | 03+0800. | 04+0.500 | 05+08.32 | 06+0.260 | 07+58.43 | 08+32.62 |
| 09+29.75 | 10+0.000 | 11+12.56 | | | | | |
| 01+0115. | 02+0299. | 03+0800. | 04+0.500 | 05+08.43 | 06+0.530 | 07+65.28 | 08+28.42 |
| 09+29.76 | 10+0.000 | 11+12.56 | | | | | |
| 01+0109. | 02+0299. | 03+0815. | 04+0.500 | 05+08.09 | 06+0.280 | 07+55.08 | 08+38.14 |
| 09+29.72 | 10+0.000 | 11+12.56 | | | | | |
| 01+0109. | 02+0299. | 03+0830. | 04+0.500 | 05+08.03 | 06+0.212 | 07+53.68 | 08+42.62 |
| 09+29.75 | 10+0.000 | 11+12.56 | | | | | |
| 01+0109. | 02+0299. | 03+0845. | 04+0.500 | 05+07.99 | 06+0.204 | 07+53.21 | 08+45.39 |
| 09+29.70 | 10+0.000 | 11+12.55 | | | | | |
| 01+0109. | 02+0299. | 03+0900. | 04+0.500 | 05+07.95 | 06+0.328 | 07+53.02 | 08+43.92 |
| 09+29.72 | 10+0.000 | 11+12.56 | | | | | |
| 01+0115. | 02+0299. | 03+0900. | 04+0.500 | 05+08.01 | 06+0.315 | 07+53.75 | 08+42.52 |
| 09+29.72 | 10+0.000 | 11+12.56 | | | | | |
| 01+0109. | 02+0299. | 03+0915. | 04+0.500 | 05+07.62 | 06+0.344 | 07+52.97 | 08+44.64 |
| 09+29.72 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+0930. | 04+0.500 | 05+07.57 | 06+0.321 | 07+53.11 | 08+43.56 |
| 09+29.73 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+0945. | 04+0.500 | 05+07.55 | 06+0.282 | 07+53.68 | 08+43.04 |
| 09+29.73 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1000. | 04+0.500 | 05+07.53 | 06+0.314 | 07+54.84 | 08+42.55 |
| 09+29.72 | 10+0.000 | 11+12.54 | | | | | |
| 01+0115. | 02+0299. | 03+1000. | 04+0.500 | 05+07.57 | 06+0.000 | 07+53.65 | 08+43.45 |
| 09+29.72 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1015. | 04+1.366 | 05+359.1 | 06+33.97 | 07+55.83 | 08+41.54 |
| 09+29.68 | 10+0.010 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1030. | 04+5.872 | 05+280.1 | 06+31.19 | 07+48.13 | 08+44.26 |
| 09+29.68 | 10+0.000 | 11+12.53 | | | | | |
| 01+0109. | 02+0299. | 03+1045. | 04+6.202 | 05+278.7 | 06+38.94 | 07+46.32 | 08+46.36 |
| 09+29.66 | 10+0.000 | 11+12.53 | | | | | |
| 01+0109. | 02+0299. | 03+1100. | 04+07.13 | 05+285.0 | 06+32.28 | 07+48.06 | 08+45.32 |
| 09+29.67 | 10+0.000 | 11+12.53 | | | | | |
| 01+0115. | 02+0299. | 03+1100. | 04+5.142 | 05+298.3 | 06+48.08 | 07+49.59 | 08+44.37 |
| [illegible] | 10+0.010 | 11+12.53 | | | | | |
| 01+0109. | 02+0299. | 03+1115. | 04+07.39 | 05+282.1 | 06+30.85 | 07+48.50 | 08+44.79 |
| 09+29.67 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1130. | 04+07.54 | 05+274.3 | 06+27.76 | 07+49.05 | 08+44.06 |
| 09+29.67 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1145. | 04+07.11 | 05+272.9 | 06+27.82 | 07+49.82 | 08+43.72 |
| 09+29.66 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1200. | 04+07.57 | 05+257.8 | 06+26.92 | 07+50.90 | 08+42.90 |
| 09+29.66 | 10+0.000 | 11+12.54 | | | | | |
| 01+0115. | 02+0299. | 03+1200. | 04+07.46 | 05+271.7 | 06+29.69 | 07+49.57 | 08+43.87 |
| 09+29.67 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1215. | 04+07.77 | 05+259.5 | 06+30.99 | 07+51.26 | 08+41.69 |
| 09+29.66 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1230. | 04+07.30 | 05+275.7 | 06+30.48 | 07+51.63 | 08+41.67 |
| 09+29.65 | 10+0.000 | 11+12.53 | | | | | |
| 01+0109. | 02+0299. | 03+1245. | 04+6.869 | 05+268.3 | 06+32.77 | 07+52.49 | 08+40.68 |
| 09+29.64 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1300. | 04+07.21 | 05+276.0 | 06+27.71 | 07+53.15 | 08+39.04 |
| 09+29.64 | 10+0.000 | 11+12.54 | | | | | |
| 01+0115. | 02+0299. | 03+1300. | 04+07.29 | 05+269.9 | 06+31.26 | 07+52.13 | 08+40.77 |
| 09+29.65 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1315. | 04+6.172 | 05+259.2 | 06+27.66 | 07+54.50 | 08+39.04 |
| 09+29.65 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1330. | 04+07.22 | 05+244.9 | 06+31.16 | 07+54.91 | 08+37.78 |
| 09+29.64 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1345. | 04+07.18 | 05+246.8 | 06+26.04 | 07+55.12 | 08+35.72 |
| 09+29.64 | 10+0.000 | 11+12.53 | | | | | |
| 01+0109. | 02+0299. | 03+1400. | 04+6.333 | 05+253.1 | 06+28.44 | 07+55.33 | 08+35.19 |
| 09+29.64 | 10+0.000 | 11+12.54 | | | | | |
| 01+0115. | 02+0299. | 03+1400. | 04+6.726 | 05+251.0 | 06+28.92 | 07+54.97 | 08+36.93 |
| 09+29.64 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1415. | 04+07.27 | 05+247.0 | 06+26.85 | 07+55.33 | 08+34.75 |
| 09+29.64 | 10+0.000 | 11+12.54 | | | | | |
| 01+0109. | 02+0299. | 03+1430. | 04+07.83 | 05+229.7 | 06+23.25 | 07+54.32 | 08+33.87 |
| 09+29.64 | 10+0.000 | 11+12.53 | | | | | |
| 01+0109. | 02+0299. | 03+1445. | 04+5.877 | 05+255.1 | 06+28.84 | 07+54.52 | 08+34.41 |
| 09+29.63 | 10+0.000 | 11+12.53 | | | | | |
| 01+0109. | 02+0299. | 03+1500. | 04+5.963 | 05+267.0 | 06+24.09 | 07+53.75 | 08+35.68 |
| 09+29.63 | 10+0.000 | 11+12.53 | | | | | |
| 01+0115. | 02+0299. | 03+1500. | 04+6.735 | 05+249.7 | 06+29.21 | 07+54.48 | 08+34.68 |
| 09+29.63 | 10+0.000 | 11+12.53 | | | | | |
| 01+0109. | 02+0299. | 03+1515. | 04+5.156 | 05+234.1 | 06+23.56 | 07+53.46 | 08+37.00 |
| 09+29.63 | 10+0.000 | 11+12.52 | | | | | |
| 01+0109. | 02+0299. | 03+1530. | 04+4.534 | 05+230.3 | 06+24.38 | 07+53.55 | 08+37.90 |
| 09+29.63 | 10+0.000 | 11+12.52 | | | | | |
| 01+0109. | 02+0299. | 03+1545. | 04+4.700 | 05+230.6 | 06+22.13 | 07+53.89 | 08+38.74 |
| 09+29.63 | 10+0.000 | 11+12.51 | | | | | |
| 01+0109. | 02+0299. | 03+1600. | 04+3.967 | 05+226.1 | 06+18.35 | 07+53.87 | 08+39.63 |
| 09+29.62 | 10+0.000 | 11+12.51 | | | | | |

+17°

Here 299 = 10/26/92 although 10/26/92 should be 300 since 1992 is leap year.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 01+0115. | 02+0299. | 03+1600. | 04+4.589 | 05+230.3 | 06+22.39 | 07+53.69 | 08+38.32 |
| 09+29.63 | 10+0.000 | 11+12.51 | | | | | |
| 01+0109. | 02+0299. | 03+1615. | 04+4.053 | 05+240.3 | 06+26.05 | 07+53.84 | 08+39.69 |
| 09+29.62 | 10+0.000 | 11+12.50 | | | | | |
| 01+0109. | 02+0299. | 03+1630. | 04+3.765 | 05+237.2 | 06+24.14 | 07+53.60 | 08+39.45 |
| 09+29.61 | 10+0.000 | 11+12.50 | | | | | |
| 01+0109. | 02+0299. | 03+1645. | 04+4.042 | 05+225.5 | 06+19.98 | 07+53.46 | 08+40.13 |
| 09+29.62 | 10+0.000 | 11+12.50 | | | | | |
| 01+0109. | 02+0299. | 03+1700. | 04+5.036 | 05+210.9 | 06+17.36 | 07+53.36 | 08+40.97 |
| 09+29.62 | 10+0.000 | 11+12.50 | | | | | |
| 01+0115. | 02+0299. | 03+1700. | 04+4.224 | 05+228.2 | 06+24.93 | 07+53.57 | 08+40.06 |
| 09+29.62 | 10+0.000 | 11+12.50 | | | | | |
| 01+0109. | 02+0299. | 03+1715. | 04+4.157 | 05+228.2 | 06+17.21 | 07+52.96 | 08+41.40 |
| 09+29.63 | 10+0.000 | 11+12.50 | | | | | |
| 01+0109. | 02+0299. | 03+1730. | 04+3.809 | 05+222.4 | 06+16.64 | 07+52.20 | 08+41.68 |
| 09+29.63 | 10+0.000 | 11+12.50 | | | | | |
| 01+0109. | 02+0299. | 03+1745. | 04+4.664 | 05+225.5 | 06+18.48 | 07+51.99 | 08+42.83 |
| 09+29.63 | 10+0.000 | 11+12.50 | | | | | |
| 01+0109. | 02+0299. | 03+1800. | 04+6.214 | 05+226.5 | 06+18.68 | 07+52.48 | 08+43.99 |
| 09+29.64 | 10+0.000 | 11+12.49 | | | | | |
| ~~01+0115.~~ | ~~02+0299.~~ | ~~03+1800.~~ | ~~04+4.711~~ | ~~05+225.6~~ | ~~06+17.90~~ | ~~07+52.41~~ | ~~08+42.48~~ |
| ~~09+29.63~~ | ~~10+0.000~~ | ~~11+12.49~~ | | | | | |
| 01+0109. | 02+0299. | 03+1815. | 04+4.857 | 05+228.4 | 06+20.38 | 07+52.52 | 08+45.82 |
| 09+29.65 | 10+0.000 | 11+12.49 | | | | | |
| 01+0109. | 02+0299. | 03+1830. | 04+4.969 | 05+226.3 | 06+18.27 | 07+52.64 | 08+47.43 |
| 09+29.65 | 10+0.000 | 11+12.48 | | | | | |
| 01+0109. | 02+0299. | 03+1845. | 04+4.573 | 05+218.0 | 06+16.31 | 07+52.68 | 08+48.92 |
| 09+29.66 | 10+0.000 | 11+12.48 | | | | | |
| 01+0109. | 02+0299. | 03+1900. | 04+4.463 | 05+217.2 | 06+17.40 | 07+52.58 | 08+50.16 |
| 09+29.66 | 10+0.000 | 11+12.48 | | | | | |
| ~~01+0115.~~ | ~~02+0299.~~ | ~~03+1900.~~ | ~~04+4.715~~ | ~~05+222.6~~ | ~~06+18.79~~ | ~~07+52.60~~ | ~~08+48.08~~ |
| ~~09+29.66~~ | ~~10+0.000~~ | ~~11+12.48~~ | | | | | |
| 01+0109. | 02+0299. | 03+1915. | 04+5.029 | 05+218.1 | 06+14.43 | 07+52.71 | 08+50.88 |
| 09+29.66 | 10+0.000 | 11+12.48 | | | | | |
| 01+0109. | 02+0299. | 03+1930. | 04+4.712 | 05+214.9 | 06+15.24 | 07+52.69 | 08+51.38 |
| 09+29.67 | 10+0.000 | 11+12.48 | | | | | |
| 01+0109. | 02+0299. | 03+1945. | 04+5.796 | 05+212.0 | 06+14.60 | 07+52.69 | 08+51.89 |
| 09+29.67 | 10+0.000 | 11+12.48 | | | | | |
| 01+0109. | 02+0299. | 03+2000. | 04+4.831 | 05+213.8 | 06+15.00 | 07+52.64 | 08+52.67 |
| 09+29.67 | 10+0.000 | 11+12.48 | | | | | |
| ~~01+0115.~~ | ~~02+0299.~~ | ~~03+2000.~~ | ~~04+5.092~~ | ~~05+214.7~~ | ~~06+14.98~~ | ~~07+52.68~~ | ~~08+51.70~~ |
| ~~09+29.67~~ | ~~10+0.000~~ | ~~11+12.48~~ | | | | | |
| 01+0109. | 02+0299. | 03+2015. | 04+4.636 | 05+212.9 | 06+12.99 | 07+52.31 | 08+54.29 |
| 09+29.67 | 10+0.000 | 11+12.48 | | | | | |
| 01+0109. | 02+0299. | 03+2030. | 04+4.370 | 05+207.9 | 06+13.04 | 07+51.95 | 08+57.18 |
| 09+29.67 | 10+0.000 | 11+12.48 | | | | | |
| 01+0109. | 02+0299. | 03+2045. | 04+4.189 | 05+207.9 | 06+14.22 | 07+51.57 | 08+60.81 |
| 09+29.67 | 10+0.000 | 11+12.48 | | | | | |
| 01+0109. | 02+0299. | 03+2100. | 04+3.824 | 05+213.4 | 06+14.68 | 07+51.19 | 08+64.12 |
| 09+29.66 | 10+0.000 | 11+12.48 | | | | | |
| ~~01+0115.~~ | ~~02+0299.~~ | ~~03+2100.~~ | ~~04+4.255~~ | ~~05+210.5~~ | ~~06+14.00~~ | ~~07+51.75~~ | ~~08+59.10~~ |
| ~~09+29.67~~ | ~~10+0.000~~ | ~~11+12.48~~ | | | | | |
| 01+0109. | 02+0299. | 03+2115. | 04+3.572 | 05+215.4 | 06+12.99 | 07+50.72 | 08+66.33 |
| 09+29.66 | 10+0.000 | 11+12.47 | | | | | |
| 01+0109. | 02+0299. | 03+2130. | 04+2.889 | 05+210.8 | 06+10.99 | 07+49.97 | 08+69.51 |
| 09+29.66 | 10+0.000 | 11+12.47 | | | | | |
| 01+0109. | 02+0299. | 03+2145. | 04+2.956 | 05+205.8 | 06+12.85 | 07+49.20 | 08+074.0 |
| 09+29.66 | 10+0.000 | 11+12.47 | | | | | |
| 01+0109. | 02+0299. | 03+2200. | 04+2.819 | 05+205.9 | 06+11.85 | 07+48.82 | 08+077.0 |
| 09+29.66 | 10+0.000 | 11+12.46 | | | | | |
| ~~01+0115.~~ | ~~02+0299.~~ | ~~03+2200.~~ | ~~04+3.059~~ | ~~05+209.5~~ | ~~06+12.82~~ | ~~07+49.68~~ | ~~08+0[illegible]1.7~~ |
| ~~09+29.64~~ | ~~10+0.000~~ | ~~11+12.46~~ | | | | | |
| 01+0109. | 02+0299. | 03+2215. | 04+2.659 | 05+211.1 | 06+13.65 | 07+48.41 | 08+078.3 |
| 09+29.66 | 10+0.000 | 11+12.46 | | | | | |
| 01+0109. | 02+0299. | 03+2230. | 04+2.450 | 05+220.4 | 06+32.39 | 07+48.12 | 08+080.7 |
| 09+29.65 | 10+0.000 | 11+12.46 | | | | | |
| 01+0109. | 02+0299. | 03+2245. | 04+2.645 | 05+208.6 | 06+23.66 | 07+47.61 | 08+083.7 |
| 09+29.65 | 10+0.000 | 11+12.45 | | | | | |
| 01+0109. | 02+0299. | 03+2300. | 04+1.961 | 05+224.3 | 06+21.35 | 07+47.34 | 08+085.7 |
| 09+29.65 | 10+0.000 | 11+12.46 | | | | | |
| ~~01+0115.~~ | ~~02+0299.~~ | ~~03+2300.~~ | ~~04+2.429~~ | ~~05+216.0~~ | ~~06+26.43~~ | ~~07+47.87~~ | ~~08+082.1~~ |
| ~~09+29.65~~ | ~~10+0.000~~ | ~~11+12.46~~ | | | | | |
| 01+0109. | 02+0299. | 03+2315. | 04+1.481 | 05+239.8 | 06+35.57 | 07+46.35 | 08+087.9 |
| 09+29.65 | 10+0.000 | 11+12.45 | | | | | |
| 01+0109. | 02+0299. | 03+2330. | 04+1.663 | 05+259.0 | 06+35.78 | 07+46.06 | 08+089.9 |
| 09+29.65 | 10+0.000 | 11+12.45 | | | | | |
| 01+0109. | 02+0299. | 03+2345. | 04+1.838 | 05+216.8 | 06+31.08 | 07+46.63 | 08+088.4 |
| 09+29.66 | 10+0.000 | 11+12.45 | | | | | |
| 01+0109. | 02+0299. | 03+2400. | 04+0.864 | 05+09.50 | 06+41.14 | 07+45.76 | 08+088.6 |
| 09+29.66 | 10+0.000 | 11+12.44 | | | | | |
| ~~01+0115.~~ | ~~02+0299.~~ | ~~03+2400.~~ | ~~04+1.462~~ | ~~05+255.3~~ | ~~06+66.63~~ | ~~07+46.20~~ | ~~08+088.7~~ |
| ~~09+29.65~~ | ~~10+0.000~~ | ~~11+12.44~~ | | | | | |
| 01+0109. | 02+0300. | 03+0015. | 04+1.557 | 05+266.6 | 06+076.5 | 07+44.44 | 08+091.1 |
| 09+29.66 | 10+0.000 | 11+12.44 | | | | | |
| 01+0109. | 02+0300. | 03+0030. | 04+1.276 | 05+246.5 | 06+42.93 | 07+43.86 | 08+094.9 |
| 09+29.66 | 10+0.000 | 11+12.44 | | | | | |
| 01+0109. | 02+0300. | 03+0045. | 04+1.796 | 05+194.0 | 06+19.34 | 07+44.61 | 08+094.3 |
| 09+29.66 | 10+0.000 | 11+12.44 | | | | | |
| 01+0109. | 02+0300. | 03+0100. | 04+1.836 | 05+215.9 | 06+25.05 | 07+45.30 | 08+093.2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 09+29.66 | 10+0.000 | 11+12.44 | | | | | |
| 01+0115. | 02+0300. | 03+0100. | 04+1.616 | 05+222.7 | 06+50.78 | 07+44.55 | 08+093.4 |
| 09+29.66 | 10+0.000 | 11+12.44 | | | | | |
| 01+0109. | 02+0300. | 03+0115. | 04+1.554 | 05+205.3 | 06+24.97 | 07+46.36 | 08+089.6 |
| 09+29.66 | 10+0.000 | 11+12.43 | | | | | |
| 01+0109. | 02+0300. | 03+0130. | 04+1.884 | 05+217.3 | 06+32.53 | 07+46.23 | 08+089.2 |
| 09+29.67 | 10+0.000 | 11+12.43 | | | | | |
| 01+0109. | 02+0300. | 03+0145. | 04+2.797 | 05+250.0 | 06+35.32 | 07+46.77 | 08+088.0 |
| 09+29.66 | 10+0.000 | 11+12.43 | | | | | |
| 01+0109. | 02+0300. | 03+0200. | 04+2.495 | 05+265.8 | 06+29.27 | 07+47.64 | 08+086.0 |
| 09+29.66 | 10+0.000 | 11+12.43 | | | | | |
| 01+0115. | 02+0300. | 03+0200. | 04+2.182 | 05+234.2 | 06+39.44 | 07+46.75 | 08+088.2 |
| 09+29.66 | 10+0.000 | 11+12.43 | | | | | |
| 01+0109. | 02+0300. | 03+0215. | 04+2.565 | 05+232.6 | 06+33.89 | 07+47.96 | 08+085.4 |
| 09+29.66 | 10+0.000 | 11+12.43 | | | | | |
| 01+0109. | 02+0300. | 03+0230. | 04+2.906 | 05+268.2 | 06+31.59 | 07+48.35 | 08+084.1 |
| 09+29.66 | 10+0.000 | 11+12.43 | | | | | |
| 01+0109. | 02+0300. | 03+0245. | 04+3.240 | 05+282.3 | 06+27.30 | 07+48.90 | 08+081.5 |
| 09+29.66 | 10+0.000 | 11+12.42 | | | | | |
| 01+0109. | 02+0300. | 03+0300. | 04+3.974 | 05+261.2 | 06+23.73 | 07+49.05 | 08+079.6 |
| 09+29.66 | 10+0.000 | 11+12.43 | | | | | |
| ~~01+0115.~~ | ~~02+0300.~~ | ~~03+0300.~~ | ~~04+3.171~~ | ~~05+261.6~~ | ~~06+34.36~~ | ~~07+48.57~~ | ~~08+082.6~~ |
| ~~09+29.66~~ | ~~10+0.000~~ | ~~11+12.43~~ | | | | | |
| 01+0109. | 02+0300. | 03+0315. | 04+4.178 | 05+271.1 | 06+25.63 | 07+49.26 | 08+077.6 |
| 09+29.66 | 10+0.000 | 11+12.43 | | | | | |
| 01+0109. | 02+0300. | 03+0330. | 04+4.279 | 05+279.7 | 06+28.72 | 07+49.46 | 08+075.6 |
| 09+29.66 | 10+0.000 | 11+12.43 | | | | | |
| 01+0109. | 02+0300. | 03+0345. | 04+5.550 | 05+306.3 | 06+27.57 | 07+50.09 | 08+072.4 |
| 09+29.67 | 10+0.000 | 11+12.43 | | | | | |
| 01+0109. | 02+0300. | 03+0400. | 04+4.924 | 05+302.0 | 06+27.22 | 07+50.23 | 08+70.00 |
| 09+29.68 | 10+0.000 | 11+12.43 | | | | | |
| ~~01+0115.~~ | ~~02+0300.~~ | ~~03+0400.~~ | ~~04+4.733~~ | ~~05+289.7~~ | ~~06+31.06~~ | ~~07+49.76~~ | ~~08+073.9~~ |
| ~~09+29.67~~ | ~~10+0.000~~ | ~~11+12.43~~ | | | | | |
| 01+0109. | 02+0300. | 03+0415. | 04+5.894 | 05+292.8 | 06+27.85 | 07+50.40 | 08+68.75 |
| 09+29.69 | 10+0.000 | 11+12.42 | | | | | |
| 01+0109. | 02+0300. | 03+0430. | 04+4.280 | 05+289.9 | 06+33.59 | 07+50.15 | 08+68.92 |
| 09+29.69 | 10+0.000 | 11+12.43 | | | | | |
| 01+0109. | 02+0300. | 03+0445. | 04+2.858 | 05+276.9 | 06+27.62 | 07+49.68 | 08+69.92 |
| 09+29.70 | 10+0.000 | 11+12.43 | | | | | |
| 01+0109. | 02+0300. | 03+0500. | 04+3.017 | 05+245.1 | 06+30.77 | 07+48.94 | 08+071.8 |
| 09+29.70 | 10+0.000 | 11+12.42 | | | | | |
| ~~01+0115.~~ | ~~02+0300.~~ | ~~03+0500.~~ | ~~04+4.012~~ | ~~05+276.5~~ | ~~06+35.46~~ | ~~07+49.79~~ | ~~08+69.84~~ |
| ~~09+29.70~~ | ~~10+0.000~~ | ~~11+12.42~~ | | | | | |
| 01+0109. | 02+0300. | 03+0515. | 04+3.137 | 05+273.6 | 06+33.12 | 07+48.50 | 08+072.9 |
| 09+29.71 | 10+0.000 | 11+12.42 | | | | | |
| 01+0109. | 02+0300. | 03+0530. | 04+2.967 | 05+291.0 | 06+23.81 | 07+48.36 | 08+073.5 |
| 09+29.72 | 10+0.000 | 11+12.42 | | | | | |
| 01+0109. | 02+0300. | 03+0545. | 04+3.479 | 05+277.1 | 06+28.61 | 07+47.73 | 08+074.7 |
| 09+29.73 | 10+0.000 | 11+12.43 | | | | | |
| 01+0109. | 02+0300. | 03+0600. | 04+5.055 | 05+283.0 | 06+25.74 | 07+47.93 | 08+071.0 |
| 09+29.73 | 10+0.000 | 11+12.42 | | | | | |
| ~~01+0115.~~ | ~~02+0300.~~ | ~~03+0600.~~ | ~~04+3.668~~ | ~~05+281.3~~ | ~~06+28.74~~ | ~~07+48.13~~ | ~~08+073.0~~ |
| ~~09+29.72~~ | ~~10+0.000~~ | ~~11+12.42~~ | | | | | |
| 01+0109. | 02+0300. | 03+0615. | 04+5.497 | 05+272.2 | 06+27.33 | 07+47.58 | 08+69.32 |
| 09+29.73 | 10+0.000 | 11+12.42 | | | | | |
| 01+0109. | 02+0300. | 03+0630. | 04+5.667 | 05+293.1 | 06+20.97 | 07+47.48 | 08+67.60 |
| 09+29.74 | 10+0.000 | 11+12.42 | | | | | |
| 01+0109. | 02+0300. | 03+0645. | 04+3.577 | 05+299.0 | 06+30.92 | 07+46.86 | 08+68.38 |
| 09+29.75 | 10+0.000 | 11+12.42 | | | | | |
| 01+0109. | 02+0300. | 03+0700. | 04+3.563 | 05+296.8 | 06+31.51 | 07+46.53 | 08+68.74 |
| 09+29.76 | 10+0.000 | 11+12.42 | | | | | |
| [illegible] | [illegible] | ~~03+0700.~~ | ~~04+4.576~~ | ~~05+290.3~~ | ~~06+29.87~~ | ~~07+47.11~~ | ~~08+68.51~~ |
| [illegible] | [illegible] | ~~11+12.42~~ | | | | | |
| 01+0109. | 02+0300. | 03+0715. | 04+3.189 | 05+301.1 | 06+33.64 | 07+46.50 | 08+68.81 |
| 09+29.76 | 10+0.000 | 11+12.42 | | | | | |
| 01+0109. | 02+0300. | 03+0730. | 04+2.833 | 05+281.2 | 06+35.59 | 07+46.93 | 08+68.62 |
| 09+29.78 | 10+0.000 | 11+12.43 | | | | | |
| 01+0109. | 02+0300. | 03+0745. | 04+3.910 | 05+279.7 | 06+28.25 | 07+47.65 | 08+67.98 |
| 09+29.79 | 10+0.000 | 11+12.44 | | | | | |
| 01+0109. | 02+0300. | 03+0800. | 04+4.389 | 05+288.5 | 06+37.01 | 07+48.20 | 08+67.18 |
| 09+29.81 | 10+0.000 | 11+12.45 | | | | | |
| [illegible] | [illegible] | [illegible] | [illegible] | ~~05+282.5~~ | ~~06+36.78~~ | ~~07+47.32~~ | ~~08+68.14~~ |
| [illegible] | [illegible] | [illegible] | | | | | |
| 01+0109. | 02+0300. | 03+0815. | 04+5.015 | 05+276.4 | 06+31.72 | 07+48.56 | 08+66.13 |
| 09+29.82 | 10+0.000 | 11+12.46 | | | | | |
| 01+0109. | 02+0300. | 03+0830. | 04+5.497 | 05+302.1 | 06+33.82 | 07+48.91 | 08+65.25 |
| 09+29.83 | 10+0.000 | 11+12.47 | | | | | |
| 01+0109. | 02+0300. | 03+0845. | 04+5.428 | 05+294.6 | 06+31.64 | 07+48.98 | 08+64.02 |
| 09+29.84 | 10+0.000 | 11+12.48 | | | | | |
| 01+0109. | 02+0300. | 03+0900. | 04+6.549 | 05+300.6 | 06+24.82 | 07+49.22 | 08+63.47 |
| 09+29.84 | 10+0.000 | 11+12.48 | | | | | |
| ~~01+0115.~~ | ~~02+0300.~~ | ~~03+0900.~~ | ~~04+5.622~~ | ~~05+293.5~~ | ~~06+32.28~~ | ~~07+48.91~~ | ~~08+64.72~~ |
| ~~09+29.83~~ | ~~10+0.000~~ | ~~11+12.48~~ | | | | | |
| 01+0109. | 02+0300. | 03+0915. | 04+6.722 | 05+319.7 | 06+28.66 | 07+49.32 | 08+63.43 |
| 09+29.85 | 10+0.000 | 11+12.49 | | | | | |
| 01+0109. | 02+0300. | 03+0930. | 04+07.52 | 05+324.1 | 06+22.38 | 07+49.76 | 08+63.29 |
| 09+29.85 | 10+0.000 | 11+12.49 | | | | | |
| 01+0109. | 02+0300. | 03+0945. | 04+08.11 | 05+342.0 | 06+18.78 | 07+49.93 | 08+62.36 |
| 09+29.85 | 10+0.000 | 11+12.49 | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 01+0109. | 02+0300. | 03+1000. | 04+08.03 | 05+336.7 | 06+17.87 | 07+50.10 | 08+61.68 |
| 09+29.85 | 10+0.000 | 11+12.49 | | | | | |
| 01+0115. | 02+0300. | 03+1000. | 04+07.60 | 05+330.9 | 06+24.00 | 07+49.78 | 08+62.69 |
| 09+29.85 | 10+0.000 | 11+12.49 | | | | | |
| 01+0109. | 02+0300. | 03+1015. | 04+08.78 | 05+334.7 | 06+21.14 | 07+50.01 | 08+60.73 |
| 09+29.85 | 10+0.000 | 11+12.49 | | | | | |
| 01+0109. | 02+0300. | 03+1030. | 04+07.44 | 05+341.5 | 06+27.01 | 07+50.45 | 08+59.32 |
| 09+29.85 | 10+0.000 | 11+12.50 | | | | | |
| 01+0109. | 02+0300. | 03+1045. | 04+08.08 | 05+339.6 | 06+21.59 | 07+50.50 | 08+57.81 |
| 09+29.85 | 10+0.000 | 11+12.50 | | | | | |

2-1 Top. TB2
(in Lotus 123)
(10/29/92. LFB0132 2)

Meteorological Conditions During Testing
(Atop the Landfill)

| Julian Day | Hr&Min | W.Sp (m/s) | WD (Deg) | Sig-H (Deg) | Sig-V (Deg) | Temp (F) | RH (%) | Pres. (in-Hg) |
|---|---|---|---|---|---|---|---|---|
| 300 | 1100 | 7.11 | 287 | 13.46 | 4.47 | 44 | 49 | 29.45 |
| 300 | 1200 | 7.84 | 280 | 14.68 | 4.13 | 48 | 43 | 29.43 |
| 300 | 1300 | 7.98 | 277 | 13.65 | 4.01 | 50 | 36 | 29.42 |
| 300 | 1400 | 7.58 | 268 | 12.39 | 3.90 | 53 | 31 | 29.41 |
| 300 | 1500 | 7.52 | 266 | 13.27 | 4.07 | 53 | 27 | 29.40 |
| 300 | 1600 | 4.81 | 257 | 10.55 | 3.78 | 53 | 29 | 29.40 |
| 300 | 1700 | 4.47 | 256 | 13.60 | 3.73 | 53 | 30 | 29.39 |
| 300 | 1800 | 4.90 | 254 | 9.29 | 3.84 | 52 | 33 | 29.42 |
| 300 | 1900 | 4.50 | 250 | 11.30 | 3.96 | 52 | 41 | 29.44 |
| 300 | 2000 | 4.40 | 242 | 10.18 | 3.96 | 52 | 46 | 29.45 |
| 300 | 2100 | 3.70 | 237 | 9.59 | 3.90 | 51 | 51 | 29.45 |
| 300 | 2200 | 3.21 | 236 | 8.07 | 3.04 | 50 | 59 | 29.44 |
| 300 | 2300 | 2.99 | 237 | 9.66 | 2.69 | 49 | 65 | 29.44 |
| 300 | 2400 | 2.74 | 258 | 13.62 | 2.29 | 48 | 69 | 29.44 |
| 301 | 100 | 3.60 | 266 | 14.03 | 2.41 | 47 | 70 | 29.45 |
| 301 | 200 | 4.47 | 271 | 9.55 | 2.92 | 48 | 70 | 29.45 |
| 301 | 300 | 4.66 | 277 | 9.47 | 3.67 | 49 | 68 | 29.45 |
| 301 | 400 | 5.84 | 289 | 13.54 | 4.59 | 50 | 64 | 29.46 |
| 301 | 500 | 5.05 | 285 | 14.07 | 4.18 | 50 | 61 | 29.49 |
| 301 | 600 | 4.84 | 283 | 11.61 | 4.36 | 48 | 63 | 29.51 |
| 301 | 700 | 5.52 | 292 | 12.99 | 4.53 | 47 | 60 | 29.53 |
| 301 | 800 | 3.83 | 289 | 14.75 | 4.24 | 47 | 59 | 29.57 |
| 301 | 900 | 5.28 | 298 | 16.64 | 4.64 | 48 | 56 | 29.60 |
| 301 | 1000 | 6.03 | 326 | 23.45 | 4.59 | 48 | 54 | 29.62 |
| | average | 5.12 | 270 | 12.64 | 3.83 | 50 | 51 | 29.46 |

```
Program Name: 10424R3.DOC
Customer: IT LEASING CO.
Climatronics Job No: 10424
Revision/Date: REV 0 / AUGUST 8, 1991
               REV 1 / MAY 20, 1992 ADDED 1 HR AVERAGE
               REV 2 / JULY 14, 1992 ADDED SIGMA PHI
               REV 3 / SEPT 15, 1992 SET STORAGE AREA

Flag Usage: 0 - OUTPUT

Input Channel Usage:
S.E.01 - WIND DIRECTION
S.E.02 - VERTICAL WIND SPEED
S.E.03 - RELATIVE HUMIDITY
S.E.04 - AIR TEMPERATURE

Excitation Channel Usage:
E1 - WIND DIRECTION
E2 - TEMPERATURE
E3 - RELATIVE HUMIDITY

Control Port Usage: NONE

Pulse Input Channel Usage:
P1 - WIND SPEED
P2 - PRECIPITATION

Output Array Definitions:
01 - OUTPUT EXECUTION I.D.
02 - JULIAN DATE
03 - TIME (HH:MM)
04 - MEAN WIND SPEED (MPH)
05 - MEAN WIND VECTOR DIRECTION (DEGREES)
06 - STANDARD DEVIATION OF WIND DIRECTION (DEGREES)
07 - STANDARD DEVIATION OF VERTICAL DIRECTION (RADIAN)
08 - AVERAGE AIR TEMPERATURE (DEGREES F)
09 - AVERAGE RELATIVE HUMIDITY (PERCENT)
10 - AVERAGE BAROMETRIC PRESSURE (INCHES OF HG)
11 - TOTAL PRECIPITATION (INCHES)
12 - AVERAGE BATTERY VOLTAGE (VDC)

*******************************************************
NOTE:
THE FOLLOWING PROGRAM IS INTENDED AS A STARTUP PROGRAM
FOR USE BY THE CUSTOMER IN LEARNING THE IMP-860/CR10
PROGRAMMING LANGUAGE. IT SHOULD BE CAREFULLY REVIEWED
FOR CORRECT AVERAGING TIMES/SCAN INTERVALS AND AVERAGE
CALCULATIONS (SPECIFICALLY THE WIND DIRECTION) BEFORE
USE IN A MONITORING PROGRAM.
*******************************************************

THIS PROGRAM IS STORED IN THE SM192 STORAGE MODULE
PROGRAM AREA #8. UPON POWER-UP OF THE SYSTEM THIS
PROGRAM WILL AUTO-LOAD FROM AREA #8 INTO THE DATA-
LOGGER AND BEGIN EXECUTION. IF THE PROGRAM IS REVISED,
BE SURE TO STORE THE REVISED PROGRAM INTO AREA #8 BY
ENTERING THE FOLLOWING INSTRUCTION ON THE KEYBOARD:
```

UK130BL

2-1 Top. unit
(10/29/92)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 01+0109. | 02+0296. | 03+0745. | 04+0.500 | 05+3.225 | 06+0.000 | 07+0.038 | 08-60.45 |
| 09-270.4 | 10+30.31 | 11+0.000 | 12+13.08 | | | | |
| 01+0109. | 02+0296. | 03+0800. | 04+0.500 | 05+3.240 | 06+0.000 | 07+0.037 | 08-60.44 |
| 09-270.4 | 10+30.31 | 11+0.000 | 12+13.07 | | | | |
| 01+0121. | 02+0296. | 03+0800. | 04+0.500 | 05+3.233 | 06+0.315 | 07+0.041 | 08-60.44 |
| 09-270.4 | 10+30.31 | 11+0.000 | 12+13.08 | | | | |
| 01+0109. | 02+0296. | 03+0815. | 04+0.500 | 05+3.237 | 06+0.000 | 07+0.028 | 08-60.43 |
| 09-270.4 | 10+30.31 | 11+0.020 | 12+12.95 | | | | |
| 01+0109. | 02+0296. | 03+0830. | 04+0.500 | 05+3.246 | 06+0.000 | 07+0.030 | 08-60.42 |
| 09-269.5 | 10+30.33 | 11+0.000 | 12+12.59 | | | | |
| 01+0109. | 02+0296. | 03+0845. | 04+0.500 | 05+3.245 | 06+0.000 | 07+0.031 | 08-60.41 |
| 09-269.3 | 10+30.34 | 11+0.000 | 12+12.60 | | | | |
| 01+0109. | 02+0296. | 03+0900. | 04+0.500 | 05+3.230 | 06+0.000 | 07+0.031 | 08-60.41 |
| 09-269.3 | 10+30.25 | 11+0.000 | 12+12.60 | | | | |
| 01+0121. | 02+0296. | 03+0900. | 04+0.500 | 05+3.240 | 06+0.354 | 07+0.030 | 08-60.42 |
| 09-269.6 | 10+30.30 | 11+0.020 | 12+12.68 | | | | |
| 01+0109. | 02+0296. | 03+0915. | 04+0.500 | 05+3.216 | 06+0.000 | 07+0.033 | 08-60.42 |
| 09-269.3 | 10+30.28 | 11+0.000 | 12+12.59 | | | | |
| 01+0109. | 02+0296. | 03+0930. | 04+0.500 | 05+3.207 | 06+0.000 | 07+0.032 | 08-60.41 |
| 09-269.3 | 10+30.30 | 11+0.000 | 12+12.58 | | | | |
| 01+0109. | 02+0296. | 03+0945. | 04+0.500 | 05+3.214 | 06+0.000 | 07+0.033 | 08-60.41 |
| 09-269.3 | 10+30.24 | 11+0.000 | 12+12.58 | | | | |
| 01+0109. | 02+0296. | 03+1000. | 04+0.556 | 05+2.586 | 06+4.995 | 07+0.033 | 08-60.41 |
| 09-269.3 | 10+30.16 | 11+0.000 | 12+12.57 | | | | |
| 01+0121. | 02+0296. | 03+1000. | 04+0.514 | 05+3.056 | 06+2.513 | 07+0.034 | 08-60.41 |
| 09-269.3 | 10+30.24 | 11+0.000 | 12+12.58 | | | | |
| 01+0109. | 02+0296. | 03+1015. | 04+3.367 | 05+286.2 | 06+45.10 | 07+0.332 | 08+47.85 |
| 09+29.81 | 10+30.15 | 11+0.000 | 12+12.57 | | | | |
| 01+0109. | 02+0296. | 03+1030. | 04+6.252 | 05+324.6 | 06+23.01 | 07+0.098 | 08+51.17 |
| 09+42.54 | 10+30.13 | 11+0.030 | 12+12.56 | | | | |
| 01+0109. | 02+0296. | 03+1045. | 04+4.474 | 05+270.8 | 06+45.47 | 07+0.098 | 08+52.34 |
| 09+43.62 | 10+30.12 | 11+0.000 | 12+12.55 | | | | |
| 01+0109. | 02+0296. | 03+1100. | 04+5.813 | 05+251.1 | 06+28.78 | 07+0.094 | 08+52.27 |
| 09+43.79 | 10+30.12 | 11+0.000 | 12+12.55 | | | | |
| [redacted] | | | | | | | |
| 01+0109. | 02+0296. | 03+1115. | 04+5.694 | 05+292.3 | 06+44.56 | 07+0.105 | 08+53.04 |
| 09+44.03 | 10+30.12 | 11+0.000 | 12+12.55 | | | | |
| 01+0109. | 02+0296. | 03+1130. | 04+6.915 | 05+263.6 | 06+20.68 | 07+0.080 | 08+53.49 |
| 09+43.49 | 10+30.11 | 11+0.000 | 12+12.54 | | | | |
| 01+0109. | 02+0296. | 03+1145. | 04+6.304 | 05+294.3 | 06+25.45 | 07+0.095 | 08+53.74 |
| 09+43.22 | 10+30.10 | 11+0.000 | 12+12.55 | | | | |
| 01+0109. | 02+0296. | 03+1200. | 04+07.01 | 05+263.0 | 06+22.01 | 07+0.092 | 08+54.74 |
| 09+42.76 | 10+30.09 | 11+0.000 | 12+12.55 | | | | |
| [redacted] | | | | | | | |
| 01+0109. | 02+0296. | 03+1215. | 04+6.050 | 05+282.0 | 06+36.83 | 07+0.094 | 08+54.84 |
| 09+42.21 | 10+30.09 | 11+0.000 | 12+12.56 | | | | |
| 01+0109. | 02+0296. | 03+1230. | 04+6.214 | 05+288.9 | 06+35.94 | 07+0.129 | 08+55.48 |
| 09+41.87 | 10+30.08 | 11+0.000 | 12+12.56 | | | | |
| 01+0109. | 02+0296. | 03+1245. | 04+5.429 | 05+265.2 | 06+24.35 | 07+0.114 | 08+56.35 |
| 09+41.27 | 10+30.07 | 11+0.000 | 12+12.57 | | | | |
| 01+0109. | 02+0296. | 03+1300. | 04+5.014 | 05+266.3 | 06+49.77 | 07+0.116 | 08+56.87 |
| 09+40.38 | 10+30.06 | 11+0.000 | 12+12.57 | | | | |
| [redacted] | | | | | | | |
| 01+0109. | 02+0296. | 03+1315. | 04+6.800 | 05+212.5 | 06+25.58 | 07+0.077 | 08+56.50 |
| 09+40.85 | 10+30.05 | 11+0.000 | 12+12.57 | | | | |
| 01+0109. | 02+0296. | 03+1330. | 04+08.35 | 05+213.8 | 06+14.32 | 07+0.070 | 08+55.84 |
| 09+44.21 | 10+30.04 | 11+0.000 | 12+12.57 | | | | |
| 01+0109. | 02+0296. | 03+1345. | 04+09.39 | 05+218.0 | 06+13.53 | 07+0.057 | 08+55.82 |
| 09+45.38 | 10+30.03 | 11+0.000 | 12+12.57 | | | | |
| 01+0109. | 02+0296. | 03+1400. | 04+08.78 | 05+224.7 | 06+17.58 | 07+0.064 | 08+55.95 |
| 09+45.60 | 10+30.02 | 11+0.000 | 12+12.57 | | | | |
| [redacted] | | | | | | | |
| 01+0109. | 02+0296. | 03+1415. | 04+09.15 | 05+225.7 | 06+13.73 | 07+0.066 | 08+56.05 |
| 09+45.31 | 10+30.01 | 11+0.000 | 12+12.56 | | | | |
| 01+0109. | 02+0296. | 03+1430. | 04+09.09 | 05+219.0 | 06+12.97 | 07+0.060 | 08+56.03 |
| 09+44.81 | 10+30.01 | 11+0.000 | 12+12.56 | | | | |
| 01+0109. | 02+0296. | 03+1445. | 04+08.49 | 05+228.2 | 06+10.57 | 07+0.061 | 08+56.38 |
| 09+44.51 | 10+30.00 | 11+0.000 | 12+12.56 | | | | |
| 01+0109. | 02+0296. | 03+1500. | 04+09.22 | 05+237.0 | 06+11.97 | 07+0.064 | 08+56.46 |
| 09+44.09 | 10+30.00 | 11+0.000 | 12+12.55 | | | | |
| [redacted] | | | | | | | |
| 01+0109. | 02+0296. | 03+1515. | 04+10.48 | 05+235.9 | 06+11.10 | 07+0.061 | 08+56.24 |
| 09+43.71 | 10+29.99 | 11+0.000 | 12+12.55 | | | | |
| 01+0109. | 02+0296. | 03+1530. | 04+08.43 | 05+233.8 | 06+11.98 | 07+0.056 | 08+56.21 |
| 09+43.78 | 10+29.98 | 11+0.000 | 12+12.54 | | | | |
| 01+0109. | 02+0296. | 03+1545. | 04+08.70 | 05+224.2 | 06+12.86 | 07+0.060 | 08+55.85 |
| 09+45.01 | 10+29.97 | 11+0.000 | 12+12.53 | | | | |
| 01+0109. | 02+0296. | 03+1600. | 04+10.92 | 05+224.3 | 06+08.70 | 07+0.052 | 08+54.82 |
| 09+46.26 | 10+29.96 | 11+0.000 | 12+12.53 | | | | |
| [redacted] | | | | | | | |
| 01+0109. | 02+0296. | 03+1615. | 04+09.78 | 05+221.4 | 06+09.03 | 07+0.052 | 08+54.00 |
| 09+47.68 | 10+29.95 | 11+0.000 | 12+12.52 | | | | |
| 01+0109. | 02+0296. | 03+1630. | 04+09.37 | 05+230.6 | 06+09.77 | 07+0.053 | 08+52.96 |

-13

10/23/92 = 296+1 = 297 although it was set at 296 here. So Here: 296=10/23. and 299=10/26/92.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 09+49.71 | 10+29.95 | 11+0.000 | 12+12.51 | | | | |
| 01+0109. | 02+0296. | 03+1645. | 04+07.54 | 05+229.8 | 06+08.14 | 07+0.049 | 08+52.12 |
| 09+52.05 | 10+29.94 | 11+0.000 | 12+12.50 | | | | |
| 01+0109. | 02+0296. | 03+1700. | 04+08.11 | 05+227.2 | 06+09.16 | 07+0.049 | 08+51.24 |
| 09+54.53 | 10+29.93 | 11+0.000 | 12+12.49 | | | | |
| 01+0121. | 02+0296. | 03+1700. | 04+08.70 | 05+227.3 | 06+09.73 | 07+0.051 | 08+52.58 |
| 09+50.99 | 10+29.95 | 11+0.000 | 12+12.50 | | | | |
| 01+0109. | 02+0296. | 03+1715. | 04+08.14 | 05+225.1 | 06+07.45 | 07+0.046 | 08+50.54 |
| 09+57.31 | 10+29.93 | 11+0.000 | 12+12.48 | | | | |
| 01+0109. | 02+0296. | 03+1730. | 04+07.91 | 05+224.8 | 06+07.96 | 07+0.046 | 08+50.14 |
| 09+59.69 | 10+29.92 | 11+0.000 | 12+12.47 | | | | |
| 01+0109. | 02+0296. | 03+1745. | 04+07.69 | 05+225.6 | 06+6.939 | 07+0.047 | 08+49.83 |
| 09+61.78 | 10+29.91 | 11+0.000 | 12+12.46 | | | | |
| 01+0109. | 02+0296. | 03+1800. | 04+08.60 | 05+223.7 | 06+6.882 | 07+0.047 | 08+49.76 |
| 09+63.74 | 10+29.90 | 11+0.000 | 12+12.45 | | | | |
| ~~01+0121.~~ | ~~02+0296.~~ | ~~03+1800.~~ | ~~04+08.08~~ | ~~05+224.8~~ | ~~06+07.35~~ | ~~07+0.047~~ | ~~08+50.07~~ |
| ~~09+60.63~~ | ~~10+29.91~~ | ~~11+0.000~~ | ~~12+12.46~~ | | | | |
| 01+0109. | 02+0296. | 03+1815. | 04+09.29 | 05+223.3 | 06+07.45 | 07+0.048 | 08+50.02 |
| 09+65.45 | 10+29.89 | 11+0.000 | 12+12.44 | | | | |
| 01+0109. | 02+0296. | 03+1830. | 04+08.66 | 05+224.9 | 06+08.48 | 07+0.050 | 08+50.15 |
| 09+66.96 | 10+29.88 | 11+0.000 | 12+12.44 | | | | |
| 01+0109. | 02+0296. | 03+1845. | 04+09.47 | 05+227.4 | 06+08.39 | 07+0.055 | 08+50.48 |
| 09+68.33 | 10+29.88 | 11+0.000 | 12+12.43 | | | | |
| 01+0109. | 02+0296. | 03+1900. | 04+09.74 | 05+225.4 | 06+08.22 | 07+0.051 | 08+50.81 |
| 09+69.37 | 10+29.88 | 11+0.000 | 12+12.43 | | | | |
| ~~01+0121.~~ | ~~02+0296.~~ | ~~03+1900.~~ | ~~04+09.29~~ | ~~05+225.3~~ | ~~06+08.27~~ | ~~07+0.051~~ | ~~08+50.37~~ |
| ~~09+67.53~~ | ~~10+29.88~~ | ~~11+0.000~~ | ~~12+12.44~~ | | | | |
| 01+0109. | 02+0296. | 03+1915. | 04+08.20 | 05+234.0 | 06+08.98 | 07+0.051 | 08+50.79 |
| 09+070.7 | 10+29.87 | 11+0.000 | 12+12.42 | | | | |
| 01+0109. | 02+0296. | 03+1930. | 04+08.27 | 05+238.3 | 06+08.58 | 07+0.057 | 08+50.87 |
| 09+072.4 | 10+29.87 | 11+0.000 | 12+12.42 | | | | |
| 01+0109. | 02+0296. | 03+1945. | 04+08.12 | 05+237.7 | 06+07.95 | 07+0.052 | 08+50.98 |
| 09+073.9 | 10+29.87 | 11+0.000 | 12+12.42 | | | | |
| 01+0109. | 02+0296. | 03+2000. | 04+07.07 | 05+241.6 | 06+08.67 | 07+0.053 | 08+50.78 |
| 09+075.2 | 10+29.87 | 11+0.000 | 12+12.41 | | | | |
| ~~01+0121.~~ | ~~02+0296.~~ | ~~03+2000.~~ | ~~04+07.92~~ | ~~05+237.9~~ | ~~06+08.96~~ | ~~07+0.053~~ | ~~08+50.86~~ |
| ~~09+073.0~~ | ~~10+29.87~~ | ~~11+0.000~~ | ~~12+12.42~~ | | | | |
| 01+0109. | 02+0296. | 03+2015. | 04+5.771 | 05+241.7 | 06+07.35 | 07+0.038 | 08+50.32 |
| 09+076.7 | 10+29.87 | 11+0.000 | 12+12.41 | | | | |
| 01+0109. | 02+0296. | 03+2030. | 04+5.809 | 05+240.5 | 06+07.22 | 07+0.042 | 08+50.16 |
| 09+078.2 | 10+29.87 | 11+0.000 | 12+12.41 | | | | |
| 01+0109. | 02+0296. | 03+2045. | 04+5.952 | 05+242.5 | 06+5.955 | 07+0.034 | 08+49.77 |
| 09+079.5 | 10+29.86 | 11+0.000 | 12+12.40 | | | | |
| 01+0109. | 02+0296. | 03+2100. | 04+6.264 | 05+242.7 | 06+6.936 | 07+0.040 | 08+49.64 |
| 09+080.7 | 10+29.86 | 11+0.000 | 12+12.40 | | | | |
| ~~01+0121.~~ | ~~02+0296.~~ | ~~03+2100.~~ | ~~04+5.949~~ | ~~05+241.8~~ | ~~06+6.939~~ | ~~07+0.039~~ | ~~08+49.97~~ |
| [illegible] | ~~10+29.86~~ | ~~11+0.000~~ | ~~12+12.41~~ | | | | |
| 01+0109. | 02+0296. | 03+2115. | 04+6.661 | 05+240.0 | 06+5.307 | 07+0.035 | 08+49.24 |
| 09+081.8 | 10+29.85 | 11+0.000 | 12+12.40 | | | | |
| 01+0109. | 02+0296. | 03+2130. | 04+6.945 | 05+235.0 | 06+6.256 | 07+0.036 | 08+49.16 |
| 09+082.8 | 10+29.84 | 11+0.000 | 12+12.40 | | | | |
| 01+0109. | 02+0296. | 03+2145. | 04+6.169 | 05+235.6 | 06+6.095 | 07+0.034 | 08+49.05 |
| 09+083.4 | 10+29.83 | 11+0.000 | 12+12.40 | | | | |
| 01+0109. | 02+0296. | 03+2200. | 04+6.751 | 05+237.7 | 06+5.477 | 07+0.033 | 08+48.78 |
| 09+084.2 | 10+29.83 | 11+0.000 | 12+12.39 | | | | |
| ~~01+0121.~~ | ~~02+0296.~~ | ~~03+2200.~~ | ~~04+6.631~~ | ~~05+237.1~~ | ~~06+6.110~~ | ~~07+0.038~~ | ~~08+49.06~~ |
| ~~09+085.1~~ | ~~10+29.86~~ | ~~11+0.000~~ | ~~12+12.40~~ | | | | |
| 01+0109. | 02+0296. | 03+2215. | 04+6.903 | 05+243.7 | 06+07.12 | 07+0.047 | 08+48.64 |
| 09+084.5 | 10+29.82 | 11+0.000 | 12+12.39 | | | | |
| 01+0109. | 02+0296. | 03+2230. | 04+07.23 | 05+247.9 | 06+08.04 | 07+0.054 | 08+48.72 |
| 09+084.4 | 10+29.81 | 11+0.000 | 12+12.39 | | | | |
| 01+0109. | 02+0296. | 03+2245. | 04+07.23 | 05+250.1 | 06+07.02 | 07+0.048 | 08+48.47 |
| 09+083.7 | 10+29.81 | 11+0.000 | 12+12.39 | | | | |
| 01+0109. | 02+0296. | 03+2300. | 04+07.27 | 05+245.5 | 06+07.47 | 07+0.048 | 08+48.16 |
| 09+083.2 | 10+29.80 | 11+0.000 | 12+12.38 | | | | |
| ~~01+0121.~~ | ~~02+0296.~~ | ~~03+2300.~~ | ~~04+07.16~~ | ~~05+246.8~~ | ~~06+07.81~~ | ~~07+0.050~~ | ~~08+48.69~~ |
| [illegible] | [illegible] | ~~11+0.000~~ | ~~12+12.39~~ | | | | |
| 01+0109. | 02+0296. | 03+2315. | 04+6.675 | 05+248.1 | 06+07.83 | 07+0.052 | 08+47.92 |
| 09+083.2 | 10+29.79 | 11+0.000 | 12+12.38 | | | | |
| 01+0109. | 02+0296. | 03+2330. | 04+07.92 | 05+246.4 | 06+08.12 | 07+0.051 | 08+47.85 |
| 09+083.1 | 10+29.78 | 11+0.000 | 12+12.38 | | | | |
| 01+0109. | 02+0296. | 03+2345. | 04+07.21 | 05+246.2 | 06+08.41 | 07+0.051 | 08+47.89 |
| 09+082.6 | 10+29.77 | 11+0.000 | 12+12.38 | | | | |
| 01+0109. | 02+0296. | 03+2400. | 04+07.86 | 05+247.6 | 06+08.96 | 07+0.057 | 08+48.06 |
| 09+082.5 | 10+29.77 | 11+0.000 | 12+12.38 | | | | |
| ~~01+0121.~~ | ~~02+0296.~~ | ~~03+2400.~~ | ~~04+07.42~~ | ~~05+247.1~~ | ~~06+08.38~~ | ~~07+0.053~~ | ~~08+47.95~~ |
| ~~09+082.9~~ | ~~10+29.78~~ | ~~11+0.000~~ | ~~12+12.38~~ | | | | |
| 01+0109. | 02+0297. | 03+0015. | 04+08.16 | 05+251.4 | 06+09.02 | 07+0.064 | 08+48.35 |
| 09+082.8 | 10+29.77 | 11+0.000 | 12+12.38 | | | | |
| 01+0109. | 02+0297. | 03+0030. | 04+08.74 | 05+251.1 | 06+09.97 | 07+0.065 | 08+48.52 |
| 09+082.9 | 10+29.76 | 11+0.000 | 12+12.38 | | | | |
| 01+0109. | 02+0297. | 03+0045. | 04+08.82 | 05+250.7 | 06+09.42 | 07+0.069 | 08+48.60 |
| 09+082.4 | 10+29.76 | 11+0.000 | 12+12.38 | | | | |
| 01+0109. | 02+0297. | 03+0100. | 04+08.48 | 05+244.8 | 06+10.48 | 07+0.062 | 08+48.41 |
| 09+082.2 | 10+29.76 | 11+0.000 | 12+12.37 | | | | |
| ~~01+0121.~~ | ~~02+0297.~~ | ~~03+0100.~~ | ~~04+08.55~~ | ~~05+249.5~~ | ~~06+10.11~~ | ~~07+0.066~~ | ~~08+48.47~~ |
| ~~09+082.6~~ | ~~10+29.76~~ | ~~11+0.000~~ | ~~12+12.38~~ | | | | |
| 01+0109. | 02+0297. | 03+0115. | 04+07.81 | 05+248.4 | 06+09.90 | 07+0.068 | 08+48.16 |
| 09+082.3 | 10+29.75 | 11+0.000 | 12+12.37 | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 01+0109. | 02+0297. | 03+0130. | 04+08.58 | 05+242.7 | 06+09.88 | 07+0.060 | 08+47.94 |
| 09+082.5 | 10+29.74 | 11+0.000 | 12+12.37 | | | | |
| 01+0109. | 02+0297. | 03+0145. | 04+09.27 | 05+238.0 | 06+08.08 | 07+0.052 | 08+47.84 |
| 09+082.6 | 10+29.73 | 11+0.000 | 12+12.37 | | | | |
| 01+0109. | 02+0297. | 03+0200. | 04+09.63 | 05+237.0 | 06+07.30 | 07+0.046 | 08+47.58 |
| 09+083.0 | 10+29.72 | 11+0.000 | 12+12.37 | | | | |
| 01+0121. | 02+0297. | 03+0200. | 04+08.82 | 05+241.5 | 06+09.94 | 07+0.058 | 08+47.88 |
| 09+082.6 | 10+29.74 | 11+0.000 | 12+12.37 | | | | |
| 01+0109. | 02+0297. | 03+0215. | 04+08.50 | 05+246.1 | 06+08.50 | 07+0.060 | 08+47.16 |
| 09+083.7 | 10+29.71 | 11+0.000 | 12+12.37 | | | | |
| 01+0109. | 02+0297. | 03+0230. | 04+08.02 | 05+248.3 | 06+08.59 | 07+0.056 | 08+46.92 |
| 09+084.5 | 10+29.70 | 11+0.000 | 12+12.37 | | | | |
| 01+0109. | 02+0297. | 03+0245. | 04+08.97 | 05+248.6 | 06+08.45 | 07+0.063 | 08+46.88 |
| 09+085.2 | 10+29.70 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0300. | 04+08.99 | 05+246.8 | 06+09.06 | 07+0.064 | 08+47.05 |
| 09+086.0 | 10+29.69 | 11+0.000 | 12+12.37 | | | | |
| ~~01+0121.~~ | ~~02+0297.~~ | ~~03+0300.~~ | ~~04+08.62~~ | ~~05+247.5~~ | ~~06+08.72~~ | ~~07+0.062~~ | ~~08+47.01~~ |
| ~~09+086.8~~ | ~~10+29.70~~ | ~~11+0.000~~ | ~~12+12.37~~ | | | | |
| 01+0109. | 02+0297. | 03+0315. | 04+10.08 | 05+246.9 | 06+08.90 | 07+0.067 | 08+47.33 |
| 09+086.6 | 10+29.69 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0330. | 04+10.07 | 05+249.0 | 06+08.84 | 07+0.064 | 08+47.59 |
| 09+086.7 | 10+29.68 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0345. | 04+10.12 | 05+252.0 | 06+08.73 | 07+0.064 | 08+47.46 |
| 09+086.8 | 10+29.68 | 11+0.000 | 12+12.37 | | | | |
| 01+0109. | 02+0297. | 03+0400. | 04+08.91 | 05+246.6 | 06+08.61 | 07+0.064 | 08+47.02 |
| 09+087.3 | 10+29.68 | 11+0.000 | 12+12.36 | | | | |
| ~~01+0121.~~ | ~~02+0297.~~ | ~~03+0400.~~ | ~~04+09.80~~ | ~~05+248.6~~ | ~~06+09.03~~ | ~~07+0.066~~ | ~~08+47.35~~ |
| ~~[illegible]~~ | ~~10+29.68~~ | ~~11+0.000~~ | ~~12+12.36~~ | | | | |
| 01+0109. | 02+0297. | 03+0415. | 04+09.30 | 05+250.3 | 06+08.69 | 07+0.059 | 08+46.94 |
| 09+087.9 | 10+29.68 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0430. | 04+08.56 | 05+244.8 | 06+07.81 | 07+0.054 | 08+46.73 |
| 09+088.3 | 10+29.68 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0445. | 04+08.74 | 05+243.9 | 06+08.72 | 07+0.054 | 08+46.67 |
| 09+088.9 | 10+29.67 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0500. | 04+07.73 | 05+246.7 | 06+08.82 | 07+0.059 | 08+46.40 |
| 09+089.4 | 10+29.67 | 11+0.000 | 12+12.36 | | | | |
| ~~01+0121.~~ | ~~02+0297.~~ | ~~03+0500.~~ | ~~04+08.58~~ | ~~05+246.4~~ | ~~06+08.86~~ | ~~07+0.059~~ | ~~08+46.68~~ |
| ~~09+088.6~~ | ~~10+29.67~~ | ~~11+0.000~~ | ~~12+12.36~~ | | | | |
| 01+0109. | 02+0297. | 03+0515. | 04+07.13 | 05+249.0 | 06+08.48 | 07+0.059 | 08+46.25 |
| 09+090.4 | 10+29.66 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0530. | 04+07.70 | 05+245.3 | 06+08.30 | 07+0.059 | 08+46.24 |
| 09+091.4 | 10+29.65 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0545. | 04+07.49 | 05+248.4 | 06+08.37 | 07+0.059 | 08+46.23 |
| 09+092.3 | 10+29.65 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0600. | 04+10.43 | 05+240.5 | 06+08.10 | 07+0.052 | 08+46.59 |
| 09+092.8 | 10+29.64 | 11+0.000 | 12+12.35 | | | | |
| ~~01+0121.~~ | ~~02+0297.~~ | ~~03+0600.~~ | ~~04+08.19~~ | ~~05+245.8~~ | ~~06+08.97~~ | ~~07+0.060~~ | ~~08+46.33~~ |
| ~~09+091.7~~ | ~~10+29.65~~ | ~~11+0.000~~ | ~~12+12.36~~ | | | | |
| 01+0109. | 02+0297. | 03+0615. | 04+10.82 | 05+240.1 | 06+08.78 | 07+0.054 | 08+47.03 |
| 09+092.3 | 10+29.63 | 11+0.000 | 12+12.35 | | | | |
| 01+0109. | 02+0297. | 03+0630. | 04+12.15 | 05+239.3 | 06+08.38 | 07+0.050 | 08+47.65 |
| 09+091.4 | 10+29.62 | 11+0.000 | 12+12.35 | | | | |
| 01+0109. | 02+0297. | 03+0645. | 04+11.32 | 05+241.0 | 06+09.16 | 07+0.060 | 08+48.16 |
| 09+090.1 | 10+29.61 | 11+0.000 | 12+12.35 | | | | |
| 01+0109. | 02+0297. | 03+0700. | 04+09.32 | 05+246.2 | 06+10.62 | 07+0.070 | 08+48.50 |
| 09+089.6 | 10+29.61 | 11+0.000 | 12+12.35 | | | | |
| ~~[illegible]~~ | ~~[illegible]~~ | ~~[illegible]~~ | ~~04+10.90~~ | ~~[illegible]~~ | ~~[illegible]~~ | ~~07+0.060~~ | ~~[illegible]~~ |
| ~~[illegible]~~ | ~~10+29.62~~ | ~~11+0.000~~ | ~~12+12.35~~ | | | | |
| 01+0109. | 02+0297. | 03+0715. | 04+11.84 | 05+241.2 | 06+10.16 | 07+0.062 | 08+49.14 |
| 09+089.3 | 10+29.61 | 11+0.000 | 12+12.35 | | | | |
| 01+0109. | 02+0297. | 03+0730. | 04+12.19 | 05+239.7 | 06+09.84 | 07+0.066 | 08+49.69 |
| 09+088.5 | 10+29.60 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0745. | 04+12.58 | 05+238.9 | 06+09.84 | 07+0.062 | 08+50.25 |
| 09+087.6 | 10+29.60 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0800. | 04+13.59 | 05+237.5 | 06+09.09 | 07+0.058 | 08+50.69 |
| 09+086.0 | 10+29.59 | 11+0.000 | 12+12.36 | | | | |
| ~~[illegible]~~ | ~~[illegible]~~ | ~~[illegible]~~ | ~~04+12.55~~ | ~~[illegible]~~ | ~~[illegible]~~ | ~~[illegible]~~ | ~~08+49.94~~ |
| ~~[illegible]~~ | ~~[illegible]~~ | ~~[illegible]~~ | ~~12+12.36~~ | | | | |
| 01+0109. | 02+0297. | 03+0815. | 04+14.95 | 05+241.2 | 06+10.24 | 07+0.060 | 08+51.06 |
| 09+084.4 | 10+29.59 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0830. | 04+14.04 | 05+237.9 | 06+10.19 | 07+0.067 | 08+51.51 |
| 09+083.3 | 10+29.58 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0845. | 04+12.83 | 05+242.1 | 06+11.50 | 07+0.064 | 08+51.95 |
| 09+082.7 | 10+29.57 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+0900. | 04+13.28 | 05+247.3 | 06+11.98 | 07+0.074 | 08+52.45 |
| 09+082.0 | 10+29.57 | 11+0.000 | 12+12.37 | | | | |
| ~~[illegible]~~ | ~~[illegible]~~ | ~~[illegible]~~ | ~~04+13.77~~ | ~~05+242.1~~ | ~~06+11.51~~ | ~~07+0.067~~ | ~~08+51.76~~ |
| ~~[illegible]~~ | ~~10+29.58~~ | ~~11+0.000~~ | ~~12+12.36~~ | | | | |
| 01+0109. | 02+0297. | 03+0915. | 04+14.65 | 05+245.8 | 06+11.04 | 07+0.074 | 08+53.11 |
| 09+080.8 | 10+29.57 | 11+0.000 | 12+12.37 | | | | |
| 01+0109. | 02+0297. | 03+0930. | 04+14.72 | 05+255.2 | 06+12.19 | 07+0.073 | 08+53.62 |
| 09+079.6 | 10+29.56 | 11+0.000 | 12+12.37 | | | | |
| 01+0109. | 02+0297. | 03+0945. | 04+15.24 | 05+249.3 | 06+11.63 | 07+0.075 | 08+54.09 |
| 09+077.4 | 10+29.56 | 11+0.000 | 12+12.38 | | | | |
| 01+0109. | 02+0297. | 03+1000. | 04+14.66 | 05+251.9 | 06+10.10 | 07+0.074 | 08+53.81 |
| 09+076.4 | 10+29.55 | 11+0.000 | 12+12.38 | | | | |
| ~~01+0121.~~ | ~~02+0297.~~ | ~~03+1000.~~ | ~~04+14.82~~ | ~~05+250.5~~ | ~~06+11.72~~ | ~~07+0.078~~ | ~~08+53.66~~ |
| ~~09+078.5~~ | ~~10+29.56~~ | ~~11+0.000~~ | ~~12+12.38~~ | | | | |
| 01+0109. | 02+0297. | 03+1015. | 04+13.39 | 05+245.3 | 06+11.67 | 07+0.069 | 08+54.33 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 09+076.1 | 10+29.55 | 11+0.000 | 12+12.38 | | | | |
| 01+0109. | 02+0297. | 03+1030. | 04+14.72 | 05+247.5 | 06+10.69 | 07+0.072 | 08+54.80 |
| 09+074.5 | 10+29.53 | 11+0.000 | 12+12.39 | | | | |
| 01+0109. | 02+0297. | 03+1045. | 04+10.33 | 05+227.6 | 06+18.00 | 07+0.065 | 08+55.71 |
| 09+073.6 | 10+29.53 | 11+0.000 | 12+12.39 | | | | |
| 01+0109. | 02+0297. | 03+1100. | 04+11.07 | 05+228.5 | 06+15.62 | 07+0.066 | 08+56.79 |
| 09+073.1 | 10+29.52 | 11+0.000 | 12+12.39 | | | | |
| 01+0121. | 02+0297. | 03+1100. | 04+12.38 | 05+237.3 | 06+16.98 | 07+0.070 | 08+55.41 |
| 09+076.4 | 10+29.53 | 11+0.000 | 12+12.39 | | | | |
| 01+0109. | 02+0297. | 03+1115. | 04+12.83 | 05+233.9 | 06+11.18 | 07+0.059 | 08+57.29 |
| 09+070.7 | 10+29.52 | 11+0.000 | 12+12.40 | | | | |
| 01+0109. | 02+0297. | 03+1130. | 04+10.66 | 05+229.1 | 06+09.98 | 07+0.064 | 08+56.94 |
| 09+070.8 | 10+29.51 | 11+0.000 | 12+12.40 | | | | |
| 01+0109. | 02+0297. | 03+1145. | 04+10.72 | 05+226.9 | 06+12.08 | 07+0.062 | 08+58.12 |
| 09+69.78 | 10+29.50 | 11+0.000 | 12+12.40 | | | | |
| 01+0109. | 02+0297. | 03+1200. | 04+11.37 | 05+227.0 | 06+11.59 | 07+0.065 | 08+58.52 |
| 09+68.58 | 10+29.49 | 11+0.000 | 12+12.41 | | | | |
| 01+0121. | 02+0297. | 03+1200. | 04+11.39 | 05+229.2 | 06+11.59 | 07+0.063 | 08+57.72 |
| 09+69.96 | 10+29.50 | 11+0.000 | 12+12.40 | | | | |
| 01+0109. | 02+0297. | 03+1215. | 04+11.69 | 05+225.0 | 06+13.17 | 07+0.057 | 08+58.84 |
| 09+66.97 | 10+29.48 | 11+0.000 | 12+12.42 | | | | |
| 01+0109. | 02+0297. | 03+1230. | 04+12.70 | 05+216.7 | 06+09.99 | 07+0.055 | 08+58.75 |
| 09+66.66 | 10+29.47 | 11+0.000 | 12+12.42 | | | | |
| 01+0109. | 02+0297. | 03+1245. | 04+11.23 | 05+218.9 | 06+13.78 | 07+0.068 | 08+59.48 |
| 09+66.82 | 10+29.46 | 11+0.000 | 12+12.42 | | | | |
| 01+0109. | 02+0297. | 03+1300. | 04+11.73 | 05+223.3 | 06+14.37 | 07+0.061 | 08+59.23 |
| 09+67.30 | 10+29.46 | 11+0.000 | 12+12.42 | | | | |
| 01+0121. | 02+0297. | 03+1300. | 04+11.86 | 05+221.0 | 06+13.33 | 07+0.062 | 08+59.07 |
| 09+66.95 | 10+29.47 | 11+0.000 | 12+12.43 | | | | |
| 01+0109. | 02+0297. | 03+1315. | 04+12.35 | 05+228.3 | 06+11.15 | 07+0.060 | 08+59.46 |
| 09+67.03 | 10+29.45 | 11+0.000 | 12+12.43 | | | | |
| 01+0109. | 02+0297. | 03+1330. | 04+10.26 | 05+223.4 | 06+13.10 | 07+0.062 | 08+59.76 |
| 09+67.46 | 10+29.45 | 11+0.000 | 12+12.43 | | | | |
| 01+0109. | 02+0297. | 03+1345. | 04+09.76 | 05+225.4 | 06+09.69 | 07+0.059 | 08+59.93 |
| 09+67.45 | 10+29.44 | 11+0.000 | 12+12.43 | | | | |
| 01+0109. | 02+0297. | 03+1400. | 04+10.30 | 05+230.6 | 06+12.42 | 07+0.058 | 08+60.31 |
| 09+66.40 | 10+29.44 | 11+0.000 | 12+12.42 | | | | |
| 01+0121. | 02+0297. | 03+1400. | 04+10.67 | 05+226.9 | 06+11.97 | 07+0.060 | 08+58.86 |
| 09+67.08 | 10+29.45 | 11+0.000 | 12+12.43 | | | | |
| 01+0109. | 02+0297. | 03+1415. | 04+08.43 | 05+224.1 | 06+11.01 | 07+0.052 | 08+59.81 |
| 09+67.26 | 10+29.43 | 11+0.000 | 12+12.42 | | | | |
| 01+0109. | 02+0297. | 03+1430. | 04+08.78 | 05+218.2 | 06+10.23 | 07+0.053 | 08+58.96 |
| 09+071.4 | 10+29.42 | 11+0.000 | 12+12.41 | | | | |
| 01+0109. | 02+0297. | 03+1445. | 04+08.46 | 05+214.1 | 06+09.74 | 07+0.057 | 08+58.82 |
| 09+073.7 | 10+29.41 | 11+0.000 | 12+12.41 | | | | |
| 01+0109. | 02+0297. | 03+1500. | 04+07.63 | 05+224.2 | 06+09.88 | 07+0.052 | 08+58.76 |
| 09+075.3 | 10+29.41 | 11+0.000 | 12+12.40 | | | | |
| 01+0121. | 02+0297. | 03+1500. | 04+08.32 | 05+220.2 | 06+11.08 | 07+0.054 | 08+59.09 |
| 09+071.9 | 10+29.42 | 11+0.000 | 12+12.41 | | | | |
| 01+0109. | 02+0297. | 03+1515. | 04+07.37 | 05+226.1 | 06+10.43 | 07+0.044 | 08+58.33 |
| 09+077.5 | 10+29.41 | 11+0.000 | 12+12.39 | | | | |
| 01+0109. | 02+0297. | 03+1530. | 04+07.27 | 05+241.7 | 06+14.63 | 07+0.061 | 08+57.54 |
| 09+080.5 | 10+29.40 | 11+0.000 | 12+12.39 | | | | |
| 01+0109. | 02+0297. | 03+1545. | 04+6.184 | 05+234.9 | 06+19.59 | 07+0.050 | 08+56.85 |
| 09+084.7 | 10+29.39 | 11+0.010 | 12+12.38 | | | | |
| 01+0109. | 02+0297. | 03+1600. | 04+07.89 | 05+218.9 | 06+08.88 | 07+0.045 | 08+56.47 |
| 09+088.3 | 10+29.38 | 11+0.010 | 12+12.37 | | | | |
| 01+0121. | 02+0297. | 03+1600. | 04+07.18 | 05+230.3 | 06+16.44 | 07+0.051 | 08+57.29 |
| 09+088.7 | 10+29.38 | 11+0.020 | 12+12.38 | | | | |
| 01+0109. | 02+0297. | 03+1615. | 04+5.928 | 05+236.5 | 06+09.16 | 07+0.047 | 08+56.15 |
| 09+090.9 | 10+29.38 | 11+0.000 | 12+12.37 | | | | |
| 01+0109. | 02+0297. | 03+1630. | 04+4.963 | 05+232.5 | 06+11.40 | 07+0.041 | 08+55.99 |
| 09+092.4 | 10+29.38 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+1645. | 04+5.710 | 05+208.1 | 06+08.74 | 07+0.037 | 08+56.04 |
| 09+093.9 | 10+29.37 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+1700. | 04+5.041 | 05+214.7 | 06+08.94 | 07+0.039 | 08+55.92 |
| 09+095.3 | 10+29.37 | 11+0.000 | 12+12.36 | | | | |
| 01+0121. | 02+0297. | 03+1700. | 04+5.416 | 05+222.9 | 06+15.26 | 07+0.044 | 08+56.02 |
| 09+095.[illegible] | 10+29.38 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+1715. | 04+5.215 | 05+231.2 | 06+11.91 | 07+0.042 | 08+55.81 |
| 09+096.3 | 10+29.37 | 11+0.000 | 12+12.36 | | | | |
| 01+0109. | 02+0297. | 03+1730. | 04+5.814 | 05+238.5 | 06+08.65 | 07+0.043 | 08+55.59 |
| 09+097.0 | 10+29.37 | 11+0.000 | 12+12.35 | | | | |
| 01+0109. | 02+0297. | 03+1745. | 04+4.016 | 05+243.9 | 06+11.22 | 07+0.041 | 08+55.46 |
| 09+097.3 | 10+29.37 | 11+0.000 | 12+12.35 | | | | |
| 01+0109. | 02+0297. | 03+1800. | 04+3.282 | 05+232.4 | 06+15.09 | 07+0.029 | 08+55.48 |
| 09+097.5 | 10+29.36 | 11+0.000 | 12+12.35 | | | | |
| 01+0121. | 02+0297. | 03+1800. | 04+4.582 | 05+236.5 | 06+12.96 | 07+0.045 | 08+55.58 |
| 09+097.0 | 10+29.37 | 11+0.000 | 12+12.35 | | | | |
| 01+0109. | 02+0297. | 03+1815. | 04+3.361 | 05+254.9 | 06+11.98 | 07+0.028 | 08+55.38 |
| 09+097.7 | 10+29.36 | 11+0.000 | 12+12.34 | | | | |
| 01+0109. | 02+0297. | 03+1830. | 04+2.544 | 05+240.8 | 06+12.81 | 07+0.021 | 08+55.39 |
| 09+098.0 | 10+29.36 | 11+0.000 | 12+12.34 | | | | |
| 01+0109. | 02+0297. | 03+1845. | 04+4.987 | 05+271.1 | 06+22.20 | 07+0.044 | 08+55.34 |
| 09+098.3 | 10+29.37 | 11+0.000 | 12+12.34 | | | | |
| 01+0109. | 02+0297. | 03+1900. | 04+08.19 | 05+283.6 | 06+08.78 | 07+0.055 | 08+55.37 |
| 09+098.5 | 10+29.38 | 11+0.000 | 12+12.34 | | | | |
| 01+0121. | 02+0297. | 03+1900. | 04+4.770 | 05+262.6 | 06+21.95 | 07+0.055 | 08+55.37 |
| 09+098.1 | 10+29.37 | 11+0.000 | 12+12.34 | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 01+0109. | 02+0297. | 03+1915. | 04+5.675 | 05+260.6 | 06+11.99 | 07+0.052 | 08+55.19 |
| 09+098.5 | 10+29.37 | 11+0.010 | 12+12.34 | | | | |
| 01+0109. | 02+0297. | 03+1930. | 04+4.911 | 05+252.7 | 06+10.10 | 07+0.052 | 08+55.05 |
| 09+098.5 | 10+29.37 | 11+0.000 | 12+12.34 | | | | |
| 01+0109. | 02+0297. | 03+1945. | 04+6.489 | 05+267.9 | 06+6.800 | 07+0.043 | 08+54.81 |
| 09+098.7 | 10+29.37 | 11+0.000 | 12+12.33 | | | | |
| 01+0109. | 02+0297. | 03+2000. | 04+07.03 | 05+267.9 | 06+07.91 | 07+0.054 | 08+54.75 |
| 09+099.1 | 10+29.37 | 11+0.020 | 12+12.33 | | | | |
| 01+0121. | 02+0297. | 03+2000. | 04+6.027 | 05+262.3 | 06+11.31 | 07+0.051 | 08+54.95 |
| 09+098.7 | 10+29.37 | 11+0.030 | 12+12.33 | | | | |
| 01+0109. | 02+0297. | 03+2015. | 04+6.059 | 05+272.0 | 06+08.39 | 07+0.045 | 08+54.73 |
| 09+099.5 | 10+29.36 | 11+0.010 | 12+12.33 | | | | |
| 01+0109. | 02+0297. | 03+2030. | 04+4.770 | 05+286.6 | 06+16.91 | 07+0.034 | 08+54.79 |
| 09+099.8 | 10+29.36 | 11+0.010 | 12+12.33 | | | | |
| 01+0109. | 02+0297. | 03+2045. | 04+4.608 | 05+306.7 | 06+22.32 | 07+0.043 | 08+54.74 |
| 09+100.1 | 10+29.35 | 11+0.020 | 12+12.32 | | | | |
| 01+0109. | 02+0297. | 03+2100. | 04+6.468 | 05+281.8 | 06+07.00 | 07+0.045 | 08+54.71 |
| 09+100.3 | 10+29.35 | 11+0.010 | 12+12.32 | | | | |
| [redacted] | | | | | | | |
| 01+0109. | 02+0297. | 03+2115. | 04+5.563 | 05+292.7 | 06+10.04 | 07+0.061 | 08+54.59 |
| 09+100.5 | 10+29.35 | 11+0.000 | 12+12.32 | | | | |
| 01+0109. | 02+0297. | 03+2130. | 04+5.231 | 05+306.2 | 06+13.08 | 07+0.048 | 08+54.52 |
| 09+100.7 | 10+29.35 | 11+0.000 | 12+12.32 | | | | |
| 01+0109. | 02+0297. | 03+2145. | 04+6.063 | 05+304.7 | 06+14.50 | 07+0.058 | 08+54.38 |
| 09+100.7 | 10+29.35 | 11+0.000 | 12+12.32 | | | | |
| 01+0109. | 02+0297. | 03+2200. | 04+5.761 | 05+306.9 | 06+11.27 | 07+0.055 | 08+54.24 |
| 09+100.5 | 10+29.34 | 11+0.000 | 12+12.32 | | | | |
| [redacted] | | | | | | | |
| 01+0109. | 02+0297. | 03+2215. | 04+5.854 | 05+299.2 | 06+11.83 | 07+0.066 | 08+54.04 |
| 09+100.4 | 10+29.34 | 11+0.000 | 12+12.32 | | | | |
| 01+0109. | 02+0297. | 03+2230. | 04+5.728 | 05+293.4 | 06+11.58 | 07+0.062 | 08+53.90 |
| 09+100.3 | 10+29.35 | 11+0.000 | 12+12.31 | | | | |
| 01+0109. | 02+0297. | 03+2245. | 04+6.193 | 05+300.2 | 06+11.31 | 07+0.065 | 08+53.84 |
| 09+100.3 | 10+29.35 | 11+0.000 | 12+12.31 | | | | |
| 01+0109. | 02+0297. | 03+2300. | 04+6.744 | 05+305.2 | 06+12.69 | 07+0.076 | 08+53.81 |
| 09+100.2 | 10+29.35 | 11+0.000 | 12+12.31 | | | | |
| [redacted] | | | | | | | |
| 01+0109. | 02+0297. | 03+2315. | 04+09.25 | 05+318.0 | 06+12.06 | 07+0.072 | 08+53.69 |
| 09+099.7 | 10+29.34 | 11+0.000 | 12+12.31 | | | | |
| 01+0109. | 02+0297. | 03+2330. | 04+11.40 | 05+314.5 | 06+11.09 | 07+0.072 | 08+53.23 |
| 09+098.3 | 10+29.34 | 11+0.000 | 12+12.31 | | | | |
| 01+0109. | 02+0297. | 03+2345. | 04+12.81 | 05+327.4 | 06+13.37 | 07+0.078 | 08+52.44 |
| 09+096.8 | 10+29.33 | 11+0.000 | 12+12.31 | | | | |
| 01+0109. | 02+0297. | 03+2400. | 04+14.10 | 05+338.7 | 06+17.54 | 07+0.076 | 08+51.03 |
| 09+095.0 | 10+29.31 | 11+0.000 | 12+12.31 | | | | |
| [redacted] | | | | | | | |
| 01+0109. | 02+0298. | 03+0015. | 04+15.13 | 05+326.8 | 06+14.24 | 07+0.082 | 08+49.53 |
| 09+095.3 | 10+29.33 | 11+0.000 | 12+12.31 | | | | |
| 01+0109. | 02+0298. | 03+0030. | 04+15.35 | 05+321.8 | 06+13.17 | 07+0.078 | 08+48.75 |
| 09+096.7 | 10+29.33 | 11+0.000 | 12+12.30 | | | | |
| 01+0109. | 02+0298. | 03+0045. | 04+14.85 | 05+318.0 | 06+13.58 | 07+0.083 | 08+48.05 |
| 09+098.0 | 10+29.33 | 11+0.000 | 12+12.30 | | | | |
| 01+0109. | 02+0298. | 03+0100. | 04+13.42 | 05+319.2 | 06+10.92 | 07+0.078 | 08+47.13 |
| 09+098.7 | 10+29.32 | 11+0.010 | 12+12.29 | | | | |
| [redacted] | | | | | | | |
| 01+0109. | 02+0298. | 03+0115. | 04+13.64 | 05+321.7 | 06+11.97 | 07+0.080 | 08+46.77 |
| 09+099.3 | 10+29.33 | 11+0.000 | 12+12.29 | | | | |
| 01+0109. | 02+0298. | 03+0130. | 04+11.74 | 05+321.7 | 06+12.98 | 07+0.088 | 08+46.74 |
| 09+099.2 | 10+29.32 | 11+0.000 | 12+12.29 | | | | |
| 01+0109. | 02+0298. | 03+0145. | 04+14.73 | 05+322.5 | 06+11.71 | 07+0.075 | 08+46.62 |
| 09+097.5 | 10+29.31 | 11+0.000 | 12+12.29 | | | | |
| 01+0109. | 02+0298. | 03+0200. | 04+12.89 | 05+323.0 | 06+14.03 | 07+0.084 | 08+46.36 |
| 09+095.8 | 10+29.30 | 11+0.000 | 12+12.29 | | | | |
| [redacted] | | | | | | | |
| 01+0109. | 02+0298. | 03+0215. | 04+12.86 | 05+329.1 | 06+14.76 | 07+0.082 | 08+46.24 |
| 09+094.7 | 10+29.30 | 11+0.000 | 12+12.28 | | | | |
| 01+0109. | 02+0298. | 03+0230. | 04+11.76 | 05+335.6 | 06+16.75 | 07+0.086 | 08+46.11 |
| 09+094.4 | 10+29.30 | 11+0.000 | 12+12.28 | | | | |
| 01+0109. | 02+0298. | 03+0245. | 04+11.72 | 05+347.8 | 06+14.28 | 07+0.082 | 08+46.05 |
| 09+094.9 | 10+29.30 | 11+0.000 | 12+12.28 | | | | |
| 01+0109. | 02+0298. | 03+0300. | 04+13.30 | 05+346.4 | 06+17.99 | 07+0.075 | 08+46.03 |
| 09+094.3 | 10+29.31 | 11+0.000 | 12+12.27 | | | | |
| [redacted] | | | | | | | |
| 01+0109. | 02+0298. | 03+0315. | 04+15.91 | 05+348.0 | 06+15.20 | 07+0.070 | 08+45.33 |
| 09+092.9 | 10+29.31 | 11+0.000 | 12+12.27 | | | | |
| 01+0109. | 02+0298. | 03+0330. | 04+16.59 | 05+346.8 | 06+15.73 | 07+0.076 | 08+44.93 |
| 09+092.6 | 10+29.33 | 11+0.000 | 12+12.27 | | | | |
| 01+0109. | 02+0298. | 03+0345. | 04+16.36 | 05+347.3 | 06+15.45 | 07+0.079 | 08+44.81 |
| 09+092.1 | 10+29.33 | 11+0.000 | 12+12.27 | | | | |
| 01+0109. | 02+0298. | 03+0400. | 04+15.06 | 05+342.6 | 06+16.61 | 07+0.083 | 08+44.80 |
| 09+090.3 | 10+29.34 | 11+0.000 | 12+12.27 | | | | |
| [redacted] | | | | | | | |

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09+092.0  10+29.33  11+0.000  12+12.27
01+0109.  02+0298.  03+0415.  04+16.14  05+333.9  06+16.34  07+0.074  08+44.60
09+089.2  10+29.34  11+0.000  12+12.27
01+0109.  02+0298.  03+0430.  04+13.67  05+326.8  06+12.41  07+0.083  08+44.35
09+088.9  10+29.33  11+0.000  12+12.27
01+0109.  02+0298.  03+0445.  04+11.71  05+327.7  06+14.20  07+0.081  08+44.30
09+089.0  10+29.33  11+0.000  12+12.26
01+0109.  02+0298.  03+0500.  04+13.44  05+331.6  06+12.33  07+0.075  08+44.53
09+088.1  10+29.34  11+0.000  12+12.26
01+0121.  02+0298.  03+0500.  04+13.74  05+330.0  06+14.20  07+0.080  08+44.45
09+088.8  10+29.34  11+0.000  12+12.26
01+0109.  02+0298.  03+0515.  04+14.00  05+347.8  06+17.67  07+0.082  08+44.54
09+086.2  10+29.35  11+0.000  12+12.26
01+0109.  02+0298.  03+0530.  04+14.67  05+349.4  06+16.71  07+0.079  08+44.25
09+085.3  10+29.35  11+0.000  12+12.26
01+0109.  02+0298.  03+0545.  04+16.06  05+349.4  06+13.93  07+0.078  08+44.30
09+084.1  10+29.35  11+0.000  12+12.25
01+0109.  02+0298.  03+0600.  04+16.39  05+349.4  06+14.37  07+0.073  08+44.27
09+083.0  10+29.35  11+0.000  12+12.25
01+0121.  02+0298.  03+0600.  04+15.28  05+349.0  06+15.76  07+0.078  08+44.36
09+084.6  10+29.35  11+0.000  12+12.25
01+0109.  02+0298.  03+0615.  04+12.28  05+347.1  06+17.60  07+0.085  08+44.11
09+083.3  10+29.36  11+0.000  12+12.25
01+0109.  02+0298.  03+0630.  04+12.13  05+346.2  06+13.86  07+0.074  08+44.02
09+083.1  10+29.36  11+0.000  12+12.25
01+0109.  02+0298.  03+0645.  04+12.97  05+349.3  06+16.94  07+0.081  08+43.58
09+084.1  10+29.36  11+0.000  12+12.25
01+0109.  02+0298.  03+0700.  04+10.99  05+355.4  06+14.80  07+0.085  08+43.70
09+084.7  10+29.36  11+0.000  12+12.25
01+0121.  02+0298.  03+0700.  04+12.0[illegible]  05+349.5  06+16.27  07+0.082  08+43.85
09+083.8  10+29.36  11+0.000  12+12.25
01+0109.  02+0298.  03+0715.  04+14.24  05+352.6  06+15.98  07+0.075  08+44.17
09+083.3  10+29.35  11+0.000  12+12.24
01+0109.  02+0298.  03+0730.  04+13.17  05+349.9  06+16.04  07+0.082  08+44.52
09+081.0  10+29.35  11+0.000  12+12.24
01+0109.  02+0298.  03+0745.  04+15.59  05+354.1  06+15.25  07+0.086  08+44.80
09+079.1  10+29.36  11+0.000  12+12.24
01+0109.  02+0298.  03+0800.  04+12.29  05+345.6  06+17.33  07+0.079  08+44.83
09+078.2  10+29.36  11+0.000  12+12.24
01+0121.  02+0298.  03+0800.  04+13.[illegible]  05+356.6  06+16.4[illegible]  07+0.081  08+44.58
[illegible]  10+29.36  11+0.000  12+12.24
01+0109.  02+0298.  03+0815.  04+13.52  05+349.1  06+16.49  07+0.080  08+44.89
09+077.5  10+29.37  11+0.000  12+12.24
01+0109.  02+0298.  03+0830.  04+14.48  05+346.5  06+15.05  07+0.074  08+44.91
09+076.7  10+29.37  11+0.000  12+12.24
01+0109.  02+0298.  03+0845.  04+14.60  05+344.0  06+15.18  07+0.073  08+44.97
09+075.7  10+29.37  11+0.000  12+12.24
01+0109.  02+0298.  03+0900.  04+14.15  05+336.9  06+20.47  07+0.082  08+45.19
09+074.9  10+29.37  11+0.000  12+12.24
01+0121.  02+0298.  03+0900.  04+14.19  05+344.2  06+17.51  07+0.075  08+44.99
09+070.2  10+29.37  11+0.000  12+12.24
01+0109.  02+0298.  03+0915.  04+13.45  05+334.5  06+17.14  07+0.083  08+45.30
09+073.9  10+29.37  11+0.000  12+12.24
01+0109.  02+0298.  03+0930.  04+15.14  05+339.3  06+17.89  07+0.087  08+45.42
09+073.1  10+29.37  11+0.000  12+12.24
01+0109.  02+0298.  03+0945.  04+15.77  05+341.0  06+16.02  07+0.073  08+45.46
09+072.4  10+29.37  11+0.000  12+12.24
01+0109.  02+0298.  03+1000.  04+14.55  05+336.4  06+17.73  07+0.098  08+45.49
09+071.8  10+29.37  11+0.000  12+12.24
01+0121.  02+0298.  03+1000.  04+16.73  05+337.[illegible]  06+17.3[illegible]  07+0.[illegible]  08+45.42
09+072.[illegible]  10+29.37  11+0.000  12+12.24
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09+071.1  10+29.37  11+0.000  12+12.24
01+0109.  02+0298.  03+1030.  04+15.50  05+343.1  06+16.20  07+0.079  08+45.41
09+070.3  10+29.37  11+0.000  12+12.24
01+0109.  02+0298.  03+1045.  04+16.32  05+342.7  06+15.11  07+0.077  08+45.19
09+070.2  10+29.37  11+0.000  12+12.24
01+0109.  02+0298.  03+1100.  04+13.66  05+345.7  06+15.36  07+0.075  08+45.08
09+070.8  10+29.37  11+0.000  12+12.24
01+0121.  02+0298.  03+1100.  04+[illegible]  05+342.9  06+15.9[illegible]  07+0.078  08+45.27
09+070.[illegible]  10+29.37  11+0.000  12+12.24
01+0109.  02+0298.  03+1115.  04+17.09  05+346.7  06+16.44  07+0.073  08+45.00
09+69.70  10+29.37  11+0.000  12+12.24
01+0109.  02+0298.  03+1130.  04+16.97  05+351.2  06+16.03  07+0.073  08+45.19
09+67.82  10+29.37  11+0.000  12+12.24
01+0109.  02+0298.  03+1145.  04+14.86  05+345.2  06+15.83  07+0.074  08+45.45
09+66.74  10+29.36  11+0.000  12+12.24
01+0109.  02+0298.  03+1200.  04+15.29  05+343.9  06+18.07  07+0.087  08+45.78
09+64.96  10+29.36  11+0.000  12+12.23
01+0121.  02+0298.  03+1200.  04+16.05  05+346.8  06+16.84  07+0.077  08+45.36
09+67.30  10+29.36  11+0.000  12+12.24
01+0109.  02+0298.  03+1215.  04+16.21  05+343.9  06+16.96  07+0.087  08+46.03
09+63.02  10+29.35  11+0.000  12+12.23
01+0109.  02+0298.  03+1230.  04+14.70  05+349.4  06+17.96  07+0.076  08+46.18
09+61.57  10+29.35  11+0.000  12+12.23
01+0109.  02+0298.  03+1245.  04+16.20  05+344.0  06+16.99  07+0.082  08+46.39
09+60.54  10+29.35  11+0.000  12+12.23
01+0109.  02+0298.  03+1300.  04+15.76  05+349.6  06+17.03  07+0.080  08+46.36
09+59.51  10+29.35  11+0.000  12+12.23
```

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ~~01+0121.~~ | ~~02+0298.~~ | ~~03+1300.~~ | ~~04+15.72~~ | ~~05+346.7~~ | ~~06+17.46~~ | ~~07+0.082~~ | ~~08+46.24~~ |
| ~~09+61.16~~ | ~~10+29.35~~ | ~~11+0.000~~ | ~~12+12.23~~ | | | | |
| 01+0109. | 02+0298. | 03+1315. | 04+15.04 | 05+349.1 | 06+24.64 | 07+0.088 | 08+46.55 |
| 09+58.98 | 10+29.35 | 11+0.000 | 12+12.23 | | | | |
| 01+0109. | 02+0298. | 03+1330. | 04+15.22 | 05+354.4 | 06+16.67 | 07+0.081 | 08+46.86 |
| 09+56.57 | 10+29.35 | 11+0.000 | 12+12.23 | | | | |
| 01+0109. | 02+0298. | 03+1345. | 04+15.75 | 05+338.6 | 06+21.63 | 07+0.087 | 08+46.97 |
| 09+55.97 | 10+29.35 | 11+0.000 | 12+12.23 | | | | |
| 01+0109. | 02+0298. | 03+1400. | 04+17.28 | 05+328.9 | 06+17.39 | 07+0.084 | 08+46.46 |
| 09+56.71 | 10+29.35 | 11+0.000 | 12+12.23 | | | | |
| ~~01+0121.~~ | ~~02+0298.~~ | ~~03+1400.~~ | ~~04+15.82~~ | ~~05+342.7~~ | ~~06+22.56~~ | ~~07+0.085~~ | ~~08+46.71~~ |
| ~~09+57.06~~ | ~~10+29.35~~ | ~~11+0.000~~ | ~~12+12.23~~ | | | | |
| 01+0109. | 02+0298. | 03+1415. | 04+16.74 | 05+318.6 | 06+13.56 | 07+0.082 | 08+46.06 |
| 09+57.57 | 10+29.36 | 11+0.000 | 12+12.23 | | | | |
| 01+0109. | 02+0298. | 03+1430. | 04+16.11 | 05+329.6 | 06+19.26 | 07+0.087 | 08+45.94 |
| 09+57.52 | 10+29.37 | 11+0.000 | 12+12.23 | | | | |
| 01+0109. | 02+0298. | 03+1445. | 04+15.59 | 05+325.9 | 06+14.94 | 07+0.084 | 08+45.79 |
| 09+56.81 | 10+29.37 | 11+0.000 | 12+12.23 | | | | |
| 01+0109. | 02+0298. | 03+1500. | 04+16.65 | 05+324.0 | 06+13.47 | 07+0.082 | 08+45.71 |
| 09+55.82 | 10+29.37 | 11+0.000 | 12+12.23 | | | | |
| ~~01+0121.~~ | ~~02+0298.~~ | ~~03+1500.~~ | ~~04+16.27~~ | ~~05+324.5~~ | ~~06+15.96~~ | ~~07+0.086~~ | ~~08+45.87~~ |
| ~~09+56.95~~ | ~~10+29.37~~ | ~~11+0.000~~ | ~~12+12.23~~ | | | | |
| 01+0109. | 02+0298. | 03+1515. | 04+14.18 | 05+334.5 | 06+16.68 | 07+0.092 | 08+45.94 |
| 09+54.55 | 10+29.37 | 11+0.000 | 12+12.23 | | | | |
| 01+0109. | 02+0298. | 03+1530. | 04+14.87 | 05+339.7 | 06+21.02 | 07+0.084 | 08+45.79 |
| 09+53.67 | 10+29.38 | 11+0.000 | 12+12.23 | | | | |
| 01+0109. | 02+0298. | 03+1545. | 04+14.15 | 05+352.2 | 06+17.03 | 07+0.080 | 08+45.45 |
| 09+53.30 | 10+29.38 | 11+0.000 | 12+12.22 | | | | |
| 01+0109. | 02+0298. | 03+1600. | 04+13.45 | 05+349.7 | 06+18.30 | 07+0.087 | 08+45.34 |
| 09+53.67 | 10+29.38 | 11+0.000 | 12+12.22 | | | | |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | ~~06+19.70~~ | ~~07+0.086~~ | ~~08+45.63~~ |
| [illegible] | [illegible] | [illegible] | ~~12+12.22~~ | | | | |
| 01+0109. | 02+0298. | 03+1615. | 04+12.75 | 05+342.9 | 06+17.22 | 07+0.086 | 08+45.17 |
| 09+53.61 | 10+29.39 | 11+0.000 | 12+12.22 | | | | |
| 01+0109. | 02+0298. | 03+1630. | 04+14.74 | 05+344.0 | 06+16.05 | 07+0.085 | 08+45.09 |
| 09+52.78 | 10+29.39 | 11+0.000 | 12+12.21 | | | | |
| 01+0109. | 02+0298. | 03+1645. | 04+13.86 | 05+347.9 | 06+18.04 | 07+0.082 | 08+44.81 |
| 09+52.28 | 10+29.39 | 11+0.000 | 12+12.21 | | | | |
| 01+0109. | 02+0298. | 03+1700. | 04+14.75 | 05+340.4 | 06+14.43 | 07+0.083 | 08+44.54 |
| 09+52.28 | 10+29.40 | 11+0.000 | 12+12.21 | | | | |
| [illegible] | [illegible] | ~~03+1700.~~ | [illegible] | [illegible] | ~~06+16.70~~ | ~~07+0.084~~ | ~~08+44.90~~ |
| ~~09+52.76~~ | [illegible] | [illegible] | ~~12+12.21~~ | | | | |
| 01+0109. | 02+0298. | 03+1715. | 04+13.89 | 05+343.3 | 06+16.73 | 07+0.088 | 08+44.12 |
| 09+52.64 | 10+29.40 | 11+0.000 | 12+12.21 | | | | |
| 01+0109. | 02+0298. | 03+1730. | 04+14.82 | 05+344.6 | 06+14.60 | 07+0.080 | 08+43.90 |
| 09+51.89 | 10+29.41 | 11+0.000 | 12+12.21 | | | | |
| 01+0109. | 02+0298. | 03+1745. | 04+15.04 | 05+339.2 | 06+15.54 | 07+0.085 | 08+43.46 |
| 09+51.35 | 10+29.41 | 11+0.000 | 12+12.20 | | | | |
| 01+0109. | 02+0298. | 03+1800. | 04+14.52 | 05+333.8 | 06+13.88 | 07+0.079 | 08+43.02 |
| 09+51.19 | 10+29.42 | 11+0.000 | 12+12.20 | | | | |
| ~~01+0121.~~ | ~~02+0298.~~ | ~~03+1800.~~ | ~~04+14.52~~ | ~~05+340.2~~ | ~~06+15.79~~ | ~~07+0.083~~ | ~~08+43.63~~ |
| ~~09+51.76~~ | [illegible] | ~~11+0.000~~ | ~~12+12.20~~ | | | | |
| 01+0109. | 02+0298. | 03+1815. | 04+14.60 | 05+327.9 | 06+14.90 | 07+0.087 | 08+42.99 |
| 09+50.68 | 10+29.42 | 11+0.000 | 12+12.19 | | | | |
| 01+0109. | 02+0298. | 03+1830. | 04+13.22 | 05+320.2 | 06+14.02 | 07+0.086 | 08+42.86 |
| 09+49.71 | 10+29.42 | 11+0.000 | 12+12.19 | | | | |
| 01+0109. | 02+0298. | 03+1845. | 04+14.06 | 05+315.1 | 06+11.82 | 07+0.080 | 08+42.55 |
| 09+50.39 | 10+29.43 | 11+0.000 | 12+12.19 | | | | |
| 01+0109. | 02+0298. | 03+1900. | 04+12.60 | 05+313.0 | 06+13.48 | 07+0.083 | 08+42.22 |
| 09+51.07 | 10+29.43 | 11+0.000 | 12+12.18 | | | | |
| [illegible] | [illegible] | [illegible] | ~~04+13.62~~ | ~~05+319.0~~ | ~~06+14.75~~ | ~~07+0.085~~ | ~~08+42.65~~ |
| [illegible] | [illegible] | ~~11+0.000~~ | [illegible] | | | | |
| 01+0109. | 02+0298. | 03+1915. | 04+12.91 | 05+314.5 | 06+12.57 | 07+0.079 | 08+41.90 |
| 09+51.86 | 10+29.43 | 11+0.000 | 12+12.18 | | | | |
| 01+0109. | 02+0298. | 03+1930. | 04+13.73 | 05+320.3 | 06+13.56 | 07+0.096 | 08+41.71 |
| 09+52.27 | 10+29.43 | 11+0.000 | 12+12.18 | | | | |
| 01+0109. | 02+0298. | 03+1945. | 04+12.75 | 05+319.2 | 06+12.10 | 07+0.087 | 08+41.39 |
| 09+52.17 | 10+29.43 | 11+0.000 | 12+12.18 | | | | |
| 01+0109. | 02+0298. | 03+2000. | 04+13.88 | 05+319.0 | 06+13.51 | 07+0.092 | 08+41.22 |
| 09+52.21 | 10+29.43 | 11+0.000 | 12+12.17 | | | | |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | | | | |
| 01+0109. | 02+0298. | 03+2015. | 04+11.27 | 05+324.2 | 06+14.69 | 07+0.087 | 08+40.78 |
| 09+52.58 | 10+29.43 | 11+0.000 | 12+12.17 | | | | |
| 01+0109. | 02+0298. | 03+2030. | 04+10.37 | 05+327.7 | 06+11.61 | 07+0.069 | 08+40.51 |
| 09+53.29 | 10+29.43 | 11+0.000 | 12+12.17 | | | | |
| 01+0109. | 02+0298. | 03+2045. | 04+10.16 | 05+324.7 | 06+11.84 | 07+0.080 | 08+40.13 |
| 09+54.21 | 10+29.44 | 11+0.000 | 12+12.16 | | | | |
| 01+0109. | 02+0298. | 03+2100. | 04+10.47 | 05+330.3 | 06+11.51 | 07+0.084 | 08+39.97 |
| 09+54.69 | 10+29.44 | 11+0.000 | 12+12.16 | | | | |
| ~~01+0121.~~ | ~~02+0298.~~ | ~~03+2100.~~ | ~~04+10.57~~ | [illegible] | ~~06+12.72~~ | ~~07+0.081~~ | ~~08+40.35~~ |
| ~~09+53.69~~ | ~~10+29.43~~ | ~~11+0.000~~ | ~~12+12.17~~ | | | | |
| 01+0109. | 02+0298. | 03+2115. | 04+10.89 | 05+326.9 | 06+12.56 | 07+0.074 | 08+39.86 |
| 09+55.00 | 10+29.44 | 11+0.000 | 12+12.16 | | | | |
| 01+0109. | 02+0298. | 03+2130. | 04+11.09 | 05+322.6 | 06+14.80 | 07+0.092 | 08+39.74 |
| 09+55.22 | 10+29.44 | 11+0.000 | 12+12.16 | | | | |
| 01+0109. | 02+0298. | 03+2145. | 04+11.18 | 05+319.2 | 06+13.27 | 07+0.078 | 08+39.58 |
| 09+55.11 | 10+29.43 | 11+0.000 | 12+12.16 | | | | |
| 01+0109. | 02+0298. | 03+2200. | 04+12.09 | 05+319.7 | 06+14.48 | 07+0.080 | 08+39.56 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 09+54.78 | 10+29.43 | 11+0.000 | 12+12.15 | | | | |
| 01+0121. | 02+0298. | 03+2200. | 04+11.31 | 05+322.1 | 06+14.14 | 07+0.081 | 08+39.69 |
| 09+55.03 | 10+29.44 | 11+0.000 | 12+12.16 | | | | |
| 01+0109. | 02+0298. | 03+2215. | 04+12.54 | 05+322.0 | 06+12.45 | 07+0.079 | 08+39.50 |
| 09+54.60 | 10+29.43 | 11+0.000 | 12+12.15 | | | | |
| 01+0109. | 02+0298. | 03+2230. | 04+12.07 | 05+322.4 | 06+14.47 | 07+0.083 | 08+39.34 |
| 09+54.47 | 10+29.43 | 11+0.000 | 12+12.15 | | | | |
| 01+0109. | 02+0298. | 03+2245. | 04+10.53 | 05+317.7 | 06+12.78 | 07+0.087 | 08+39.15 |
| 09+54.28 | 10+29.43 | 11+0.000 | 12+12.15 | | | | |
| 01+0109. | 02+0298. | 03+2300. | 04+13.01 | 05+319.7 | 06+12.66 | 07+0.085 | 08+39.10 |
| 09+54.32 | 10+29.43 | 11+0.000 | 12+12.15 | | | | |
| 01+0121. | 02+0298. | 03+2300. | 04+12.04 | 05+320.4 | 06+13.25 | 07+0.084 | 08+39.27 |
| 09+54.42 | 10+29.43 | 11+0.000 | 12+12.15 | | | | |
| 01+0109. | 02+0298. | 03+2315. | 04+11.51 | 05+317.1 | 06+13.39 | 07+0.088 | 08+38.86 |
| 09+54.22 | 10+29.43 | 11+0.000 | 12+12.14 | | | | |
| 01+0109. | 02+0298. | 03+2330. | 04+11.51 | 05+316.8 | 06+12.17 | 07+0.079 | 08+38.66 |
| 09+54.52 | 10+29.43 | 11+0.000 | 12+12.14 | | | | |
| 01+0109. | 02+0298. | 03+2345. | 04+11.57 | 05+314.9 | 06+12.14 | 07+0.089 | 08+38.39 |
| 09+55.13 | 10+29.42 | 11+0.000 | 12+12.14 | | | | |
| 01+0109. | 02+0298. | 03+2400. | 04+10.97 | 05+318.0 | 06+11.14 | 07+0.075 | 08+38.18 |
| 09+55.67 | 10+29.42 | 11+0.000 | 12+12.14 | | | | |
| 01+0121. | 02+0298. | [illegible] | [illegible] | 05+316.7 | 06+12.29 | 07+0.083 | 08+38.52 |
| [illegible] | [illegible] | [illegible] | 12+12.14 | | | | |
| 01+0109. | 02+0299. | 03+0015. | 04+10.32 | 05+318.7 | 06+12.37 | 07+0.074 | 08+37.95 |
| 09+56.20 | 10+29.42 | 11+0.000 | 12+12.13 | | | | |
| 01+0109. | 02+0299. | 03+0030. | 04+08.79 | 05+315.1 | 06+12.53 | 07+0.076 | 08+37.61 |
| 09+56.76 | 10+29.42 | 11+0.000 | 12+12.13 | | | | |
| 01+0109. | 02+0299. | 03+0045. | 04+07.14 | 05+305.8 | 06+11.91 | 07+0.061 | 08+36.95 |
| 09+57.71 | 10+29.42 | 11+0.000 | 12+12.13 | | | | |
| 01+0109. | 02+0299. | 03+0100. | 04+6.158 | 05+301.9 | 06+08.20 | 07+0.045 | 08+36.14 |
| 09+59.44 | 10+29.42 | 11+0.000 | 12+12.13 | | | | |
| 01+0121. | 02+0299. | 03+0100. | 04+08.10 | 05+310.4 | 06+13.26 | 07+0.072 | 08+37.16 |
| 09+57.52 | 10+29.42 | 11+0.000 | 12+12.13 | | | | |
| 01+0109. | 02+0299. | 03+0115. | 04+08.29 | 05+307.5 | 06+07.94 | 07+0.061 | 08+35.96 |
| 09+61.23 | 10+29.43 | 11+0.000 | 12+12.13 | | | | |
| 01+0109. | 02+0299. | 03+0130. | 04+07.36 | 05+306.2 | 06+07.86 | 07+0.062 | 08+35.92 |
| 09+62.07 | 10+29.43 | 11+0.000 | 12+12.12 | | | | |
| 01+0109. | 02+0299. | 03+0145. | 04+5.956 | 05+307.6 | 06+08.40 | 07+0.064 | 08+35.77 |
| 09+62.81 | 10+29.43 | 11+0.000 | 12+12.12 | | | | |
| 01+0109. | 02+0299. | 03+0200. | 04+08.29 | 05+310.1 | 06+09.21 | 07+0.072 | 08+35.87 |
| 09+63.21 | 10+29.42 | 11+0.000 | 12+12.12 | | | | |
| 01+0121. | 02+0299. | 03+0200. | 04+07.47 | [illegible] | [illegible] | 07+0.066 | [illegible] |
| 09+62.33 | [illegible] | [illegible] | 12+12.12 | | | | |
| 01+0109. | 02+0299. | 03+0215. | 04+07.39 | 05+306.5 | 06+11.60 | 07+0.076 | 08+36.25 |
| 09+62.62 | 10+29.42 | 11+0.000 | 12+12.12 | | | | |
| 01+0109. | 02+0299. | 03+0230. | 04+07.43 | 05+294.3 | 06+09.84 | 07+0.058 | 08+36.06 |
| 09+62.19 | 10+29.42 | 11+0.000 | 12+12.11 | | | | |
| 01+0109. | 02+0299. | 03+0245. | 04+10.63 | 05+305.4 | 06+10.29 | 07+0.075 | 08+36.41 |
| 09+62.29 | 10+29.42 | 11+0.000 | 12+12.11 | | | | |
| 01+0109. | 02+0299. | 03+0300. | 04+10.46 | 05+309.7 | 06+09.68 | 07+0.076 | 08+36.41 |
| 09+61.74 | 10+29.42 | 11+0.000 | 12+12.11 | | | | |
| [illegible] | 02+0299. | 03+0300. | 04+08.98 | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | 10+29.42 | 11+0.000 | 12+12.11 | | | | |
| 01+0109. | 02+0299. | 03+0315. | 04+09.94 | 05+299.2 | 06+12.24 | 07+0.068 | 08+36.22 |
| 09+61.64 | 10+29.42 | 11+0.000 | 12+12.11 | | | | |
| 01+0109. | 02+0299. | 03+0330. | 04+10.97 | 05+295.3 | 06+11.14 | 07+0.070 | 08+36.16 |
| 09+61.65 | 10+29.42 | 11+0.000 | 12+12.11 | | | | |
| 01+0109. | 02+0299. | 03+0345. | 04+10.84 | 05+297.9 | 06+12.31 | 07+0.074 | 08+36.16 |
| 09+61.22 | 10+29.42 | 11+0.000 | 12+12.11 | | | | |
| 01+0109. | 02+0299. | 03+0400. | 04+10.20 | 05+297.7 | 06+09.54 | 07+0.075 | 08+35.90 |
| 09+61.18 | 10+29.42 | 11+0.000 | 12+12.11 | | | | |
| [illegible] | 02+0299. | [illegible] | 04+10.49 | 05+297.5 | [illegible] | 07+0.072 | 08+36.11 |
| 09+61.42 | 10+29.42 | 11+0.000 | 12+12.11 | | | | |
| 01+0109. | 02+0299. | 03+0415. | 04+10.11 | 05+292.0 | 06+10.75 | 07+0.068 | 08+35.70 |
| 09+61.42 | 10+29.43 | 11+0.000 | 12+12.10 | | | | |
| 01+0109. | 02+0299. | 03+0430. | 04+11.28 | 05+286.1 | 06+07.81 | 07+0.066 | 08+35.38 |
| 09+62.24 | 10+29.44 | 11+0.000 | 12+12.10 | | | | |
| 01+0109. | 02+0299. | 03+0445. | 04+11.31 | 05+281.8 | 06+08.61 | 07+0.058 | 08+35.43 |
| 09+62.21 | 10+29.44 | 11+0.000 | 12+12.10 | | | | |
| 01+0109. | 02+0299. | 03+0500. | 04+12.98 | 05+287.9 | 06+10.19 | 07+0.067 | 08+35.41 |
| 09+62.09 | 10+29.44 | 11+0.000 | 12+12.10 | | | | |
| 01+0121. | 02+0299. | [illegible] | 04+11.42 | [illegible] | 06+10.10 | 07+0.066 | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | | | | |
| 01+0109. | 02+0299. | 03+0515. | 04+14.37 | 05+291.3 | 06+09.79 | 07+0.077 | 08+35.39 |
| 09+62.03 | 10+29.44 | 11+0.000 | 12+12.10 | | | | |
| 01+0109. | 02+0299. | 03+0530. | 04+13.43 | 05+291.1 | 06+09.76 | 07+0.072 | 08+35.47 |
| 09+61.61 | 10+29.44 | 11+0.000 | 12+12.09 | | | | |
| 01+0109. | 02+0299. | 03+0545. | 04+13.33 | 05+289.1 | 06+09.96 | 07+0.067 | 08+35.33 |
| 09+61.46 | 10+29.44 | 11+0.000 | 12+12.09 | | | | |
| 01+0109. | 02+0299. | 03+0600. | 04+13.61 | 05+289.5 | 06+09.11 | 07+0.064 | 08+35.27 |
| 09+61.21 | 10+29.44 | 11+0.000 | 12+12.09 | | | | |
| 01+0121. | 02+0299. | 03+0600. | 04+13.68 | 05+290.2 | 06+09.71 | 07+0.071 | 08+35.36 |
| 09+61.58 | 10+29.44 | 11+0.000 | 12+12.09 | | | | |
| 01+0109. | 02+0299. | 03+0615. | 04+11.15 | 05+290.1 | 06+09.03 | 07+0.068 | 08+35.15 |
| 09+61.00 | 10+29.45 | 11+0.000 | 12+12.09 | | | | |
| 01+0109. | 02+0299. | 03+0630. | 04+12.06 | 05+291.3 | 06+08.78 | 07+0.069 | 08+35.12 |
| 09+61.05 | 10+29.45 | 11+0.000 | 12+12.09 | | | | |
| 01+0109. | 02+0299. | 03+0645. | 04+11.69 | 05+287.9 | 06+09.02 | 07+0.065 | 08+35.24 |
| 09+60.87 | 10+29.45 | 11+0.000 | 12+12.09 | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 01+0109. | 02+0299. | 03+0700. | 04+11.17 | 05+292.2 | 06+10.59 | 07+0.072 | 08+35.49 |
| 09+60.77 | 10+29.45 | 11+0.000 | 12+12.09 | | | | |
| ~~01+0121.~~ | ~~02+0299.~~ | ~~03+0700.~~ | ~~04+11.52~~ | ~~05+290.6~~ | ~~06+09.52~~ | ~~07+0.069~~ | ~~08+35.25~~ |
| ~~09+60.92~~ | ~~10+29.45~~ | ~~11+0.000~~ | ~~12+12.09~~ | | | | |
| 01+0109. | 02+0299. | 03+0715. | 04+13.75 | 05+293.3 | 06+10.95 | 07+0.074 | 08+36.17 |
| 09+60.28 | 10+29.46 | 11+0.000 | 12+12.09 | | | | |
| 01+0109. | 02+0299. | 03+0730. | 04+11.73 | 05+297.5 | 06+11.55 | 07+0.078 | 08+36.80 |
| 09+59.60 | 10+29.46 | 11+0.000 | 12+12.08 | | | | |
| 01+0109. | 02+0299. | 03+0745. | 04+11.79 | 05+299.0 | 06+16.54 | 07+0.078 | 08+37.32 |
| 09+59.15 | 10+29.46 | 11+0.000 | 12+12.09 | | | | |
| 01+0109. | 02+0299. | 03+0800. | 04+12.34 | 05+299.6 | 06+12.65 | 07+0.076 | 08+38.07 |
| 09+58.46 | 10+29.46 | 11+0.000 | 12+12.09 | | | | |
| ~~01+0121.~~ | ~~02+0299.~~ | ~~03+0800.~~ | ~~04+12.40~~ | ~~05+297.3~~ | ~~06+13.32~~ | ~~07+0.077~~ | ~~08+37.09~~ |
| ~~09+59.37~~ | ~~10+29.46~~ | ~~11+0.000~~ | ~~12+12.09~~ | | | | |
| 01+0109. | 02+0299. | 03+0815. | 04+14.67 | 05+300.1 | 06+14.04 | 07+0.069 | 08+38.50 |
| 09+57.55 | 10+29.46 | 11+0.000 | 12+12.09 | | | | |
| 01+0109. | 02+0299. | 03+0830. | 04+14.01 | 05+292.2 | 06+12.43 | 07+0.068 | 08+39.09 |
| 09+56.97 | 10+29.46 | 11+0.000 | 12+12.09 | | | | |
| 01+0109. | 02+0299. | 03+0845. | 04+14.82 | 05+305.0 | 06+12.08 | 07+0.072 | 08+39.46 |
| 09+55.86 | 10+29.46 | 11+0.000 | 12+12.09 | | | | |
| 01+0109. | 02+0299. | 03+0900. | 04+14.50 | 05+300.6 | 06+15.57 | 07+0.068 | 08+40.29 |
| 09+54.89 | 10+29.46 | 11+0.000 | 12+12.10 | | | | |
| ~~01+0121.~~ | ~~02+0299.~~ | ~~03+0900.~~ | ~~04+14.50~~ | ~~05+299.5~~ | ~~06+14.35~~ | ~~07+0.076~~ | ~~08+39.33~~ |
| ~~09+56.32~~ | ~~10+29.46~~ | ~~11+0.000~~ | ~~12+12.09~~ | | | | |
| 01+0109. | 02+0299. | 03+0915. | 04+14.74 | 05+290.6 | 06+13.43 | 07+0.074 | 08+41.03 |
| 09+53.80 | 10+29.45 | 11+0.000 | 12+12.10 | | | | |
| 01+0109. | 02+0299. | 03+0930. | 04+15.43 | 05+292.5 | 06+11.45 | 07+0.073 | 08+41.32 |
| 09+52.90 | 10+29.45 | 11+0.000 | 12+12.11 | | | | |
| 01+0109. | 02+0299. | 03+0945. | 04+16.09 | 05+293.3 | 06+14.56 | 07+0.067 | 08+41.77 |
| 09+52.00 | 10+29.45 | 11+0.000 | 12+12.11 | | | | |
| 01+0109. | 02+0299. | 03+1000. | 04+16.24 | 05+290.2 | 06+12.57 | 07+0.066 | 08+42.43 |
| 09+51.02 | 10+29.45 | 11+0.000 | 12+12.11 | | | | |
| ~~01+0121.~~ | ~~02+0299.~~ | ~~03+1000.~~ | ~~04+15.62~~ | ~~05+291.6~~ | ~~06+13.11~~ | ~~07+0.070~~ | ~~08+41.64~~ |
| ~~09+52.43~~ | ~~10+29.45~~ | ~~11+0.000~~ | ~~12+12.11~~ | | | | |
| 01+0109. | 02+0299. | 03+1015. | 04+15.18 | 05+295.6 | 06+13.45 | 07+0.085 | 08+43.44 |
| 09+50.29 | 10+29.45 | 11+0.000 | 12+12.11 | | | | |
| 01+0109. | 02+0299. | 03+1030. | 04+14.75 | 05+305.2 | 06+12.09 | 07+0.079 | 08+44.06 |
| 09+49.12 | 10+29.46 | 11+0.000 | 12+12.12 | | | | |
| 01+0109. | 02+0299. | 03+1045. | 04+17.06 | 05+294.1 | 06+12.64 | 07+0.071 | 08+44.47 |
| 09+48.60 | 10+29.45 | 11+0.000 | 12+12.12 | | | | |
| 01+0109. | 02+0299. | 03+1100. | 04+16.61 | 05+304.9 | 06+11.52 | 07+0.073 | 08+45.92 |
| 09+46.76 | 10+29.44 | 11+0.000 | 12+12.13 | | | | |
| ~~01+0121.~~ | ~~02+0299.~~ | ~~03+1100.~~ | ~~04+15.90~~ | ~~05+300.6~~ | ~~06+13.44~~ | ~~07+0.078~~ | ~~08+46.47~~ |
| ~~09+48.69~~ | ~~10+29.45~~ | ~~11+0.000~~ | ~~12+12.12~~ | | | | |
| 01+0109. | 02+0299. | 03+1115. | 04+17.36 | 05+300.8 | 06+13.38 | 07+0.062 | 08+46.32 |
| 09+44.98 | 10+29.44 | 11+0.000 | 12+12.13 | | | | |
| 01+0109. | 02+0299. | 03+1130. | 04+16.23 | 05+294.7 | 06+14.58 | 07+0.078 | 08+47.13 |
| 09+43.44 | 10+29.44 | 11+0.000 | 12+12.13 | | | | |
| 01+0109. | 02+0299. | 03+1145. | 04+17.50 | 05+291.5 | 06+13.30 | 07+0.071 | 08+47.98 |
| 09+42.01 | 10+29.43 | 11+0.000 | 12+12.14 | | | | |
| 01+0109. | 02+0299. | 03+1200. | 04+19.07 | 05+284.1 | 06+12.22 | 07+0.074 | 08+48.70 |
| 09+40.50 | 10+29.42 | 11+0.000 | 12+12.15 | | | | |
| ~~01+0121.~~ | ~~02+0299.~~ | ~~03+1200.~~ | ~~04+17.54~~ | ~~05+292.8~~ | ~~06+14.68~~ | ~~07+0.072~~ | ~~08+47.53~~ |
| ~~09+42.73~~ | ~~10+29.43~~ | ~~11+0.000~~ | ~~12+12.14~~ | | | | |
| 01+0109. | 02+0299. | 03+1215. | 04+19.66 | 05+283.9 | 06+11.94 | 07+0.059 | 08+49.02 |
| 09+38.25 | 10+29.42 | 11+0.000 | 12+12.15 | | | | |
| 01+0109. | 02+0299. | 03+1230. | 04+18.41 | 05+292.1 | 06+13.98 | 07+0.069 | 08+49.61 |
| 09+37.23 | 10+29.42 | 11+0.000 | 12+12.15 | | | | |
| 01+0109. | 02+0299. | 03+1245. | 04+16.41 | 05+290.2 | 06+13.30 | 07+0.073 | 08+50.38 |
| 09+35.92 | 10+29.41 | 11+0.000 | 12+12.16 | | | | |
| 01+0109. | 02+0299. | 03+1300. | 04+16.96 | 05+295.3 | 06+12.76 | 07+0.080 | 08+51.25 |
| 09+33.83 | 10+29.42 | 11+0.000 | 12+12.16 | | | | |
| [illegible] | [illegible] | [illegible] | ~~04+17.80~~ | [illegible] | [illegible] | ~~07+0.070~~ | ~~08+50.06~~ |
| [illegible] | [illegible] | [illegible] | ~~12+12.16~~ | | | | |
| 01+0109. | 02+0299. | 03+1315. | 04+16.46 | 05+287.6 | 06+10.49 | 07+0.064 | 08+52.10 |
| 09+32.63 | 10+29.42 | 11+0.000 | 12+12.16 | | | | |
| 01+0109. | 02+0299. | 03+1330. | 04+15.40 | 05+279.5 | 06+14.65 | 07+0.076 | 08+52.86 |
| 09+31.55 | 10+29.41 | 11+0.000 | 12+12.17 | | | | |
| 01+0109. | 02+0299. | 03+1345. | 04+18.68 | 05+277.8 | 06+09.87 | 07+0.066 | 08+53.04 |
| 09+29.55 | 10+29.41 | 11+0.000 | 12+12.17 | | | | |
| 01+0109. | 02+0299. | 03+1400. | 04+17.30 | 05+280.7 | 06+11.73 | 07+0.064 | 08+53.25 |
| 09+28.28 | 10+29.41 | 11+0.000 | 12+12.17 | | | | |
| [illegible] | [illegible] | [illegible] | ~~04+16.96~~ | [illegible] | ~~06+12.39~~ | [illegible] | ~~08+52.81~~ |
| [illegible] | [illegible] | [illegible] | ~~12+12.17~~ | | | | |
| 01+0109. | 02+0299. | 03+1415. | 04+18.02 | 05+280.5 | 06+12.57 | 07+0.070 | 08+53.49 |
| 09+27.58 | 10+29.41 | 11+0.000 | 12+12.17 | | | | |
| 01+0109. | 02+0299. | 03+1430. | 04+17.06 | 05+267.5 | 06+11.55 | 07+0.078 | 08+52.88 |
| 09+26.63 | 10+29.40 | 11+0.000 | 12+12.16 | | | | |
| 01+0109. | 02+0299. | 03+1445. | 04+16.41 | 05+280.8 | 06+11.41 | 07+0.068 | 08+52.88 |
| 09+26.10 | 10+29.40 | 11+0.000 | 12+12.15 | | | | |
| 01+0109. | 02+0299. | 03+1500. | 04+15.83 | 05+287.3 | 06+08.81 | 07+0.066 | 08+52.47 |
| 09+26.51 | 10+29.40 | 11+0.000 | 12+12.15 | | | | |
| ~~01+0121.~~ | ~~02+0299.~~ | ~~03+1500.~~ | ~~04+16.83~~ | ~~05+279.1~~ | ~~06+13.27~~ | ~~07+0.071~~ | ~~08+52.93~~ |
| ~~09+26.70~~ | ~~10+29.40~~ | ~~11+0.000~~ | ~~12+12.16~~ | | | | |
| 01+0109. | 02+0299. | 03+1515. | 04+12.07 | 05+272.4 | 06+10.16 | 07+0.064 | 08+52.45 |
| 09+27.36 | 10+29.40 | 11+0.000 | 12+12.14 | | | | |
| 01+0109. | 02+0299. | 03+1530. | 04+11.22 | 05+271.9 | 06+11.31 | 07+0.068 | 08+52.65 |
| 09+28.14 | 10+29.41 | 11+0.000 | 12+12.13 | | | | |
| 01+0109. | 02+0299. | 03+1545. | 04+10.33 | 05+268.7 | 06+10.27 | 07+0.068 | 08+52.95 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 09+28.83 | 10+29.40 | 11+0.000 | 12+12.12 | | | | |
| 01+0109. | 02+0299. | 03+1600. | 04+09.45 | 05+268.4 | 06+09.76 | 07+0.062 | 08+52.95 |
| 09+29.74 | 10+29.40 | 11+0.000 | 12+12.11 | | | | |
| ~~01+0121.~~ | ~~02+0299.~~ | ~~03+1600.~~ | ~~04+10.77~~ | ~~05+270.4~~ | ~~06+10.55~~ | ~~07+0.066~~ | ~~08+52.75~~ |
| ~~09+28.51~~ | ~~10+29.40~~ | ~~11+0.000~~ | ~~12+12.12~~ | | | | |
| 01+0109. | 02+0299. | 03+1615. | 04+10.58 | 05+276.7 | 06+09.70 | 07+0.055 | 08+53.02 |
| 09+30.11 | 10+29.40 | 11+0.000 | 12+12.11 | | | | |
| 01+0109. | 02+0299. | 03+1630. | 04+10.11 | 05+275.7 | 06+11.69 | 07+0.063 | 08+52.93 |
| 09+29.90 | 10+29.39 | 11+0.000 | 12+12.10 | | | | |
| 01+0109. | 02+0299. | 03+1645. | 04+10.15 | 05+268.6 | 06+09.69 | 07+0.068 | 08+52.86 |
| 09+30.25 | 10+29.40 | 11+0.000 | 12+12.09 | | | | |
| 01+0109. | 02+0299. | 03+1700. | 04+09.16 | 05+255.0 | 06+10.83 | 07+0.071 | 08+52.71 |
| 09+30.88 | 10+29.40 | 11+0.000 | 12+12.09 | | | | |
| ~~01+0121.~~ | ~~02+0299.~~ | ~~03+1700.~~ | ~~04+10.00~~ | ~~05+269.0~~ | ~~06+13.60~~ | ~~07+0.065~~ | ~~08+52.88~~ |
| ~~09+30.28~~ | ~~10+29.39~~ | ~~11+0.000~~ | ~~12+12.10~~ | | | | |
| 01+0109. | 02+0299. | 03+1715. | 04+09.69 | 05+265.5 | 06+10.57 | 07+0.069 | 08+52.39 |
| 09+31.73 | 10+29.41 | 11+0.000 | 12+12.08 | | | | |
| 01+0109. | 02+0299. | 03+1730. | 04+09.39 | 05+268.3 | 06+08.11 | 07+0.056 | 08+51.83 |
| 09+31.95 | 10+29.41 | 11+0.000 | 12+12.08 | | | | |
| 01+0109. | 02+0299. | 03+1745. | 04+10.68 | 05+267.1 | 06+09.08 | 07+0.067 | 08+51.76 |
| 09+33.04 | 10+29.42 | 11+0.000 | 12+12.07 | | | | |
| 01+0109. | 02+0299. | 03+1800. | 04+14.14 | 05+265.9 | 06+08.99 | 07+0.066 | 08+51.93 |
| 09+34.91 | 10+29.42 | 11+0.000 | 12+12.06 | | | | |
| ~~01+0121.~~ | ~~02+0299.~~ | ~~03+1800.~~ | ~~04+10.97~~ | ~~05+266.7~~ | ~~06+09.29~~ | ~~07+0.062~~ | ~~08+51.96~~ |
| ~~09+32.91~~ | ~~10+29.42~~ | ~~11+0.000~~ | ~~12+12.07~~ | | | | |
| 01+0109. | 02+0299. | 03+1815. | 04+12.18 | 05+270.0 | 06+09.72 | 07+0.061 | 08+51.93 |
| 09+37.48 | 10+29.43 | 11+0.000 | 12+12.06 | | | | |
| 01+0109. | 02+0299. | 03+1830. | 04+11.22 | 05+264.1 | 06+11.11 | 07+0.071 | 08+52.08 |
| 09+39.83 | 10+29.44 | 11+0.000 | 12+12.06 | | | | |
| 01+0109. | 02+0299. | 03+1845. | 04+08.68 | 05+259.1 | 06+10.22 | 07+0.068 | 08+51.97 |
| 09+41.86 | 10+29.44 | 11+0.000 | 12+12.05 | | | | |
| 01+0109. | 02+0299. | 03+1900. | 04+08.20 | 05+259.3 | 06+10.45 | 07+0.074 | 08+51.89 |
| 09+43.63 | 10+29.44 | 11+0.000 | 12+12.05 | | | | |
| ~~01+0121.~~ | ~~02+0299.~~ | ~~03+1900.~~ | ~~04+10.07~~ | ~~05+263.1~~ | ~~06+11.30~~ | ~~07+0.069~~ | ~~08+51.97~~ |
| ~~09+46.70~~ | ~~10+29.44~~ | ~~11+0.000~~ | ~~12+12.05~~ | | | | |
| 01+0109. | 02+0299. | 03+1915. | 04+10.09 | 05+260.5 | 06+09.38 | 07+0.065 | 08+52.15 |
| 09+44.80 | 10+29.44 | 11+0.000 | 12+12.04 | | | | |
| 01+0109. | 02+0299. | 03+1930. | 04+08.88 | 05+256.4 | 06+09.33 | 07+0.068 | 08+52.03 |
| 09+45.52 | 10+29.45 | 11+0.000 | 12+12.04 | | | | |
| 01+0109. | 02+0299. | 03+1945. | 04+11.75 | 05+252.5 | 06+09.84 | 07+0.069 | 08+52.11 |
| 09+46.16 | 10+29.45 | 11+0.000 | 12+12.03 | | | | |
| 01+0109. | 02+0299. | 03+2000. | 04+08.67 | 05+251.3 | 06+09.50 | 07+0.072 | 08+51.92 |
| 09+46.91 | 10+29.45 | 11+0.000 | 12+12.03 | | | | |
| ~~01+0121.~~ | ~~02+0299.~~ | ~~03+2000.~~ | ~~04+09.84~~ | ~~05+255.2~~ | ~~06+10.18~~ | ~~07+0.069~~ | ~~08+52.06~~ |
| [illegible] | ~~10+29.45~~ | ~~11+0.000~~ | ~~12+12.04~~ | | | | |
| 01+0109. | 02+0299. | 03+2015. | 04+08.81 | 05+252.5 | 06+09.39 | 07+0.074 | 08+51.61 |
| 09+48.11 | 10+29.45 | 11+0.000 | 12+12.03 | | | | |
| 01+0109. | 02+0299. | 03+2030. | 04+08.15 | 05+248.4 | 06+09.48 | 07+0.066 | 08+51.23 |
| 09+49.80 | 10+29.45 | 11+0.000 | 12+12.02 | | | | |
| 01+0109. | 02+0299. | 03+2045. | 04+08.19 | 05+248.7 | 06+09.67 | 07+0.067 | 08+50.94 |
| 09+51.97 | 10+29.45 | 11+0.000 | 12+12.02 | | | | |
| 01+0109. | 02+0299. | 03+2100. | 04+07.93 | 05+250.6 | 06+09.25 | 07+0.058 | 08+50.75 |
| 09+54.15 | 10+29.44 | 11+0.000 | 12+12.01 | | | | |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | ~~12+12.02~~ | | | | |
| 01+0109. | 02+0299. | 03+2115. | 04+07.78 | 05+252.4 | 06+07.92 | 07+0.059 | 08+50.55 |
| 09+55.93 | 10+29.44 | 11+0.000 | 12+12.00 | | | | |
| 01+0109. | 02+0299. | 03+2130. | 04+6.750 | 05+251.2 | 06+07.70 | 07+0.046 | 08+49.99 |
| 09+57.91 | 10+29.44 | 11+0.000 | 12+12.00 | | | | |
| 01+0109. | 02+0299. | 03+2145. | 04+07.06 | 05+246.7 | 06+07.55 | 07+0.050 | 08+49.46 |
| 09+60.15 | 10+29.45 | 11+0.000 | 12+12.00 | | | | |
| 01+0109. | 02+0299. | 03+2200. | 04+07.10 | 05+247.0 | 06+07.51 | 07+0.049 | 08+49.41 |
| 09+61.76 | 10+29.44 | 11+0.000 | 12+12.00 | | | | |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | ~~10+29.44~~ | [illegible] | ~~12+12.00~~ | | | | |
| 01+0109. | 02+0299. | 03+2215. | 04+6.969 | 05+246.4 | 06+07.38 | 07+0.047 | 08+49.16 |
| 09+62.95 | 10+29.44 | 11+0.000 | 12+12.00 | | | | |
| 01+0109. | 02+0299. | 03+2230. | 04+6.337 | 05+254.0 | 06+11.86 | 07+0.044 | 08+48.83 |
| 09+64.36 | 10+29.44 | 11+0.000 | 12+11.99 | | | | |
| 01+0109. | 02+0299. | 03+2245. | 04+07.41 | 05+247.5 | 06+08.49 | 07+0.046 | 08+48.69 |
| 09+65.91 | 10+29.44 | 11+0.000 | 12+11.98 | | | | |
| 01+0109. | 02+0299. | 03+2300. | 04+6.005 | 05+253.4 | 06+07.74 | 07+0.040 | 08+48.41 |
| 09+67.06 | 10+29.44 | 11+0.000 | 12+11.98 | | | | |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | | | | |
| 01+0109. | 02+0299. | 03+2315. | 04+5.213 | 05+256.8 | 06+6.899 | 07+0.035 | 08+48.02 |
| 09+68.08 | 10+29.44 | 11+0.000 | 12+11.98 | | | | |
| 01+0109. | 02+0299. | 03+2330. | 04+6.322 | 05+270.8 | 06+08.24 | 07+0.039 | 08+47.94 |
| 09+69.10 | 10+29.44 | 11+0.000 | 12+11.97 | | | | |
| 01+0109. | 02+0299. | 03+2345. | 04+6.769 | 05+268.1 | 06+07.65 | 07+0.042 | 08+48.01 |
| 09+68.87 | 10+29.44 | 11+0.000 | 12+11.97 | | | | |
| 01+0109. | 02+0299. | 03+2400. | 04+6.237 | 05+289.1 | 06+5.733 | 07+0.028 | 08+48.11 |
| 09+68.75 | 10+29.44 | 11+0.000 | 12+11.96 | | | | |
| ~~01+0121.~~ | ~~02+0299.~~ | ~~03+2400.~~ | ~~04+6.135~~ | ~~05+271.2~~ | ~~06+13.62~~ | ~~07+0.040~~ | ~~08+48.02~~ |
| ~~09+68.78~~ | ~~10+29.44~~ | ~~11+0.000~~ | ~~12+11.97~~ | | | | |
| 01+0109. | 02+0300. | 03+0015. | 04+6.068 | 05+290.5 | 06+12.80 | 07+0.027 | 08+47.39 |
| 09+69.01 | 10+29.44 | 11+0.000 | 12+11.96 | | | | |
| 01+0109. | 02+0300. | 03+0030. | 04+08.49 | 05+285.4 | 06+09.20 | 07+0.031 | 08+47.35 |
| 09+070.2 | 10+29.45 | 11+0.000 | 12+11.95 | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 01+0109. | 02+0300. | 03+0045. | 04+08.07 | 05+262.0 | 06+5.860 | 07+0.043 | 08+47.15 |
| 09+071.3 | 10+29.45 | 11+0.000 | 12+11.95 | | | | |
| 01+0109. | 02+0300. | 03+0100. | 04+09.61 | 05+276.3 | 06+6.008 | 07+0.039 | 08+47.99 |
| 09+070.9 | 10+29.45 | 11+0.000 | 12+11.94 | | | | |
| 01+0121. | 02+0300. | 03+0100. | 04+08.06 | 05+278.5 | 06+14.03 | 07+0.042 | 08+47.47 |
| 09+070.3 | 10+29.45 | 11+0.000 | 12+11.95 | | | | |
| 01+0109. | 02+0300. | 03+0115. | 04+08.67 | 05+275.8 | 06+5.098 | 07+0.036 | 08+47.70 |
| 09+070.2 | 10+29.45 | 11+0.000 | 12+11.94 | | | | |
| 01+0109. | 02+0300. | 03+0130. | 04+10.15 | 05+279.8 | 06+5.789 | 07+0.041 | 08+47.58 |
| 09+070.6 | 10+29.45 | 11+0.000 | 12+11.93 | | | | |
| 01+0109. | 02+0300. | 03+0145. | 04+10.61 | 05+288.1 | 06+08.62 | 07+0.063 | 08+48.03 |
| 09+070.1 | 10+29.45 | 11+0.000 | 12+11.93 | | | | |
| 01+0109. | 02+0300. | 03+0200. | 04+10.53 | 05+292.3 | 06+07.82 | 07+0.055 | 08+48.54 |
| 09+69.53 | 10+29.45 | 11+0.000 | 12+11.92 | | | | |
| 01+0121. | 02+0300. | 03+0200. | [illegible] | 05+284.0 | 06+09.55 | 07+0.051 | 08+47.96 |
| 09+070.1 | 10+29.45 | 11+0.000 | 12+11.93 | | | | |
| 01+0109. | 02+0300. | 03+0215. | 04+09.93 | 05+285.9 | 06+08.16 | 07+0.060 | 08+48.65 |
| 09+69.40 | 10+29.45 | 11+0.000 | 12+11.92 | | | | |
| 01+0109. | 02+0300. | 03+0230. | 04+09.97 | 05+291.8 | 06+09.49 | 07+0.066 | 08+49.01 |
| 09+68.81 | 10+29.45 | 11+0.000 | 12+11.91 | | | | |
| 01+0109. | 02+0300. | 03+0245. | 04+09.76 | 05+294.4 | 06+09.51 | 07+0.064 | 08+49.24 |
| 09+67.73 | 10+29.46 | 11+0.000 | 12+11.91 | | | | |
| 01+0109. | 02+0300. | 03+0300. | 04+12.03 | 05+288.4 | 06+08.33 | 07+0.065 | 08+49.24 |
| 09+66.87 | 10+29.45 | 11+0.000 | 12+11.90 | | | | |
| 01+0121. | 02+0300. | 03+0300. | 04+10.42 | 05+290.1 | 06+09.47 | 07+0.064 | 08+49.03 |
| 09+68.20 | 10+29.45 | 11+0.000 | 12+11.91 | | | | |
| 01+0109. | 02+0300. | 03+0315. | 04+12.85 | 05+293.6 | 06+10.20 | 07+0.074 | 08+49.47 |
| 09+65.72 | 10+29.45 | 11+0.000 | 12+11.90 | | | | |
| 01+0109. | 02+0300. | 03+0330. | 04+11.70 | 05+295.9 | 06+10.61 | 07+0.080 | 08+49.56 |
| 09+64.66 | 10+29.46 | 11+0.000 | 12+11.89 | | | | |
| 01+0109. | 02+0300. | 03+0345. | 04+13.37 | 05+309.3 | 06+13.19 | 07+0.081 | 08+50.03 |
| 09+63.06 | 10+29.46 | 11+0.000 | 12+11.88 | | | | |
| 01+0109. | 02+0300. | 03+0400. | 04+14.31 | 05+309.4 | 06+11.31 | 07+0.081 | 08+50.12 |
| 09+61.35 | 10+29.47 | 11+0.000 | 12+11.88 | | | | |
| 01+0121. | 02+0300. | 03+0400. | 04+13.06 | 05+302.0 | 06+13.54 | 07+0.080 | 08+49.80 |
| 09+63.70 | 10+29.46 | 11+0.000 | 12+11.89 | | | | |
| 01+0109. | 02+0300. | 03+0415. | 04+14.61 | 05+309.0 | 06+09.81 | 07+0.071 | 08+50.15 |
| 09+60.28 | 10+29.48 | 11+0.000 | 12+11.87 | | | | |
| 01+0109. | 02+0300. | 03+0430. | 04+11.86 | 05+303.7 | 06+12.01 | 07+0.074 | 08+49.93 |
| 09+59.95 | 10+29.49 | 11+0.000 | 12+11.86 | | | | |
| 01+0109. | 02+0300. | 03+0445. | 04+08.92 | 05+295.9 | 06+10.44 | 07+0.078 | 08+49.38 |
| 09+60.65 | 10+29.49 | 11+0.000 | 12+11.86 | | | | |
| 01+0109. | 02+0300. | 03+0500. | 04+09.78 | 05+284.2 | 06+09.75 | 07+0.058 | 08+48.77 |
| 09+61.84 | 10+29.50 | 11+0.000 | 12+11.85 | | | | |
| 01+0121. | 02+0300. | 03+0500. | 04+11.29 | 05+298.2 | 06+14.07 | 07+0.073 | 08+49.56 |
| 09+60.67 | 10+29.49 | 11+0.000 | 12+11.86 | | | | |
| 01+0109. | 02+0300. | 03+0515. | 04+09.43 | 05+292.0 | 06+11.06 | 07+0.075 | 08+48.53 |
| 09+62.70 | 10+29.50 | 11+0.000 | 12+11.84 | | | | |
| 01+0109. | 02+0300. | 03+0530. | 04+07.98 | 05+297.3 | 06+10.58 | 07+0.069 | 08+48.20 |
| 09+63.39 | 10+29.51 | 11+0.000 | 12+11.83 | | | | |
| 01+0109. | 02+0300. | 03+0545. | 04+10.21 | 05+293.8 | 06+12.48 | 07+0.079 | 08+47.92 |
| 09+64.08 | 10+29.52 | 11+0.000 | 12+11.81 | | | | |
| 01+0109. | 02+0300. | 03+0600. | 04+15.66 | 05+299.6 | 06+10.67 | 07+0.071 | 08+48.02 |
| 09+61.93 | 10+29.52 | 11+0.000 | 12+11.80 | | | | |
| 01+0121. | 02+0300. | 03+0600. | 04+10.82 | [illegible] | 06+11.61 | 07+0.076 | 08+48.17 |
| [illegible] | 10+29.52 | 11+0.000 | 12+11.82 | | | | |
| 01+0109. | 02+0300. | 03+0615. | 04+14.30 | 05+294.0 | 06+12.70 | 07+0.083 | 08+47.39 |
| 09+60.31 | 10+29.52 | 11+0.000 | 12+11.79 | | | | |
| 01+0109. | 02+0300. | 03+0630. | 04+14.15 | 05+303.8 | 06+10.35 | 07+0.072 | 08+47.05 |
| 09+59.21 | 10+29.53 | 11+0.000 | 12+11.77 | | | | |
| 01+0109. | 02+0300. | 03+0645. | 04+11.02 | 05+311.0 | 06+10.38 | 07+0.080 | 08+46.62 |
| 09+59.20 | 10+29.54 | 11+0.000 | 12+11.76 | | | | |
| 01+0109. | 02+0300. | 03+0700. | 04+09.88 | 05+309.6 | 06+11.02 | 07+0.078 | 08+46.35 |
| 09+59.39 | 10+29.55 | 11+0.000 | 12+11.74 | | | | |
| 01+0121. | 02+0300. | 03+0700. | 04+12.36 | [illegible] | 06+12.99 | 07+0.079 | 08+46.86 |
| [illegible] | 10+29.55 | 11+0.000 | 12+11.78 | | | | |
| 01+0109. | 02+0300. | 03+0715. | 04+08.26 | 05+302.6 | 06+10.84 | 07+0.070 | 08+46.31 |
| 09+59.49 | 10+29.56 | 11+0.000 | 12+11.72 | | | | |
| 01+0109. | 02+0300. | 03+0730. | 04+6.747 | 05+303.1 | 06+17.38 | 07+0.082 | 08+46.45 |
| 09+59.53 | 10+29.57 | 11+0.000 | 12+11.70 | | | | |
| 01+0109. | 02+0300. | 03+0745. | 04+08.55 | 05+299.5 | 06+15.95 | 07+0.077 | 08+46.80 |
| 09+59.19 | 10+29.58 | 11+0.000 | 12+11.68 | | | | |
| 01+0109. | 02+0300. | 03+0800. | 04+10.70 | 05+301.2 | 06+13.79 | 07+0.068 | 08+47.06 |
| 09+58.31 | 10+29.58 | 11+0.000 | 12+11.65 | | | | |
| 01+0121. | 02+0300. | 03+0800. | 04+08.54 | [illegible] | 06+14.75 | 07+0.078 | 08+46.65 |
| 09+59.13 | 10+29.57 | 11+0.000 | [illegible] | | | | |
| 01+0109. | 02+0300. | 03+0815. | 04+09.44 | 05+313.0 | 06+17.63 | 07+0.095 | 08+47.44 |
| 09+57.49 | 10+29.59 | 11+0.000 | 12+11.63 | | | | |
| 01+0109. | 02+0300. | 03+0830. | 04+12.66 | 05+308.3 | 06+14.29 | 07+0.075 | 08+47.31 |
| 09+56.46 | 10+29.60 | 11+0.000 | 12+11.60 | | | | |
| 01+0109. | 02+0300. | 03+0845. | 04+12.35 | 05+313.2 | 06+15.86 | 07+0.078 | 08+47.51 |
| 09+55.68 | 10+29.61 | 11+0.000 | 12+11.58 | | | | |
| 01+0109. | 02+0300. | 03+0900. | 04+12.80 | 05+311.1 | 06+18.06 | 07+0.078 | 08+47.94 |
| 09+55.15 | 10+29.61 | 11+0.000 | 12+11.56 | | | | |
| 01+0121. | 02+0300. | 03+0900. | 04+11.81 | 05+311.4 | 06+16.64 | 07+0.081 | 08+47.55 |
| 09+56.19 | 10+29.60 | 11+0.000 | 12+11.59 | | | | |
| 01+0109. | 02+0300. | 03+0915. | 04+13.46 | 05+320.2 | 06+24.69 | 07+0.084 | 08+47.79 |
| 09+54.88 | 10+29.62 | 11+0.000 | 12+11.54 | | | | |
| 01+0109. | 02+0300. | 03+0930. | 04+12.78 | 05+340.5 | 06+18.97 | 07+0.073 | 08+48.08 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 09+54.64 | 10+29.62 | 11+0.000 | 12+11.52 | | | | |
| 01+0109. | 02+0300. | 03+0945. | 04+13.05 | 05+350.3 | 06+18.16 | 07+0.086 | 08+48.31 |
| 09+53.99 | 10+29.62 | 11+0.000 | 12+11.50 | | | | |
| 01+0109. | 02+0300. | 03+1000. | 04+14.69 | 05+345.1 | 06+19.92 | 07+0.074 | 08+48.24 |
| 09+53.14 | 10+29.62 | 11+0.000 | 12+11.49 | | | | |
| 01+0121. | 02+0300. | 03+1000. | 04+13.49 | 05+339.3 | 06+23.45 | 07+0.080 | 08+48.10 |
| 09+54.16 | 10+29.62 | 11+0.000 | 12+11.51 | | | | |
| 01+0109. | 02+0300. | 03+1015. | 04+13.77 | 05+337.6 | 06+16.76 | 07+0.085 | 08+48.38 |
| 09+52.65 | 10+29.62 | 11+0.000 | 12+11.48 | | | | |
| 01+0109. | 02+0300. | 03+1030. | 04+12.26 | 05+353.2 | 06+20.62 | 07+0.098 | 08+48.63 |
| 09+51.54 | 10+29.63 | 11+0.000 | 12+11.47 | | | | |
| 01+0109. | 02+0300. | 03+1045. | 04+12.57 | 05+344.6 | 06+19.18 | 07+0.080 | 08+48.76 |
| 09+50.34 | 10+29.63 | 11+0.000 | 12+11.46 | | | | |
| 01+0109. | 02+0300. | 03+1100. | 04+12.60 | 05+2.331 | 06+21.03 | 07+0.075 | 08+49.00 |
| 09+49.02 | 10+29.63 | 11+0.000 | 12+11.45 | | | | |
| 01+0121. | 02+0300. | 03+1100. | 04+12.80 | 05+349.4 | 06+21.54 | 07+0.085 | 08+48.69 |
| 09+50.89 | 10+29.63 | 11+0.000 | 12+11.47 | | | | |
| 01+0109. | 02+0300. | 03+1115. | 04+12.76 | 05+3.655 | 06+18.47 | 07+0.080 | 08+49.20 |
| 09+48.00 | 10+29.63 | 11+0.000 | 12+11.45 | | | | |
| 01+0109. | 02+0300. | 03+1130. | 04+13.68 | 05+334.6 | 06+21.79 | 07+0.092 | 08+49.69 |
| 09+46.49 | 10+29.63 | 11+0.000 | 12+11.45 | | | | |

1992 ANNUAL REPORT

# APPENDIX D
# ANNUAL EMISSIONS TEST REPORT
# LANDFILL GAS THERMAL OXIDIZER

MAY 1993

# ANNUAL EMISSIONS TEST REPORT
# LANDFILL GAS THERMAL OXIDIZER

## OYSTER BAY SOLID WASTE DISPOSAL COMPLEX


Prepared by:

David A. Prater
Project Manager

Reviewed by:

James Canora
Manager, Environmental Measurments


Prepared for:

LOCKWOOD, KESSLER and BARTLETT, INC.

TRC Project No. 12034-E71

April 7, 1993


TRC

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## 1.0 INTRODUCTION

TRC Environmental Corporation (TRC) was retained by RTP Environmental Associates, Inc. (RTP) to perform a compliance emission measurement program for Lockwood, Kessler and Bartlett, Inc. (LKB), the consulting engineering firm to the Town of Oyster Bay, New York, on the Landfill Gas (LFG) thermal oxidizer located at the Oyster Bay Solid Waste Disposal Complex (OBSWDC). The oxidizer is part of a subsurface gas migration contol system which destroys combustible gases collected from wells along the perimeter of the landfill.

The test program was conducted on 10 November 1992 under the direction of Mr. R. Scott Mills of RTP and Mr. Michael Rogers of the Town of Oyster Bay. The field effort was supervised by David Prater of TRC, and the test team consisted of James Canora, Raymond Potter, and Scott Neumann of TRC.

The program consisted of Volatile Organic Compound (VOC) measurements conducted according to EPA-SW 846 Method 0030 (VOST). In addition, the emission concentrations of oxygen ($O_2$), carbon dioxide ($CO_2$), sulfur dioxide ($SO_2$), oxides of nitrogen ($NO_x$), carbon monoxide (CO), and total hydrocarbons (THC) were measured according to EPA Methods 3A, 6C, 7E, 10, and 25A, respectively. Volumetric flowrate was measured according to EPA Methods 1 , 2, 3A and 4.

The VOST gas chromatography/mass spectrometry (GS/MS) analytical method used on this program was specifically designed for compounds potentially emitted from a landfill gas incinerator.

A target compound list containing forty-two compounds was developed prior to conducting the test program. The list is presented in Table 1-1. Thirty-seven of these compounds were analyzed by GC/MS calibrated with standards for each compound. Analysis for the remaining five target compounds was conducted using GC/MS ion fragmentation pattern matching for identification and the internal standard method for quantification. Six additional non-target compound GC/MS peaks with the largest analytical response were also targeted.

Section 2.0 of this report presents an overview of the test program along with a summary of results. Section 3.0 describes the process and associated control equipment and the operating parameters which were monitored during testing. Section 4.0 details the sampling and analytical methods performed, and Section 5.0 presents a discussion of TRC's quality control measures for this program. All relevant data is included in the attached appendices.

TABLE 1-1

TARGET VOLATILE ORGANIC
COMPOUNDS LIST

Oyster Bay Solid Waste Disposal Complex

Calibrated Target Compounds

Acetone
Benzene
Bromodichloromethane
Bromoform
Bromomethane
2-Butanone

Carbon Disulfide
Carbon Tetrachloride
Chlorobenzene
Chloroethane
Chloroform
Chloromethane

Dibromochloromethane
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene

1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethene
1,2-Dichloroethene (trans)
1,2-Dichloropropane
1,3-Dichloropropene (cis)
1,3-Dichloropropene (trans)

Ethyl Benzene
2-Hexanone
4-Methyl-2-Pentanone
Methylene Chloride
Styrene

1,1,2,2-Tetrachloroethane
Tetrachloroethene
Toluene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethene
Trichlorofluoromethane

Vinyl Chloride
Total Xylenes

Tentatively Identified Target Compounds

Benzaldehyde
2-Chloroethyl Vinyl Ether
1,2-Dichloroethene (cis)
Freon 13
Vinyl Acetate

## 2.0 DISCUSSION AND RESULTS

TRC conducted twelve VOST runs at the outlet of the oxidizer in accordance with EPA SW-846 Method 0030 and 40 CFR 60 Appendix A. Each Method 0030 run consisted of one 40-minute sample collected on Tenax and Tenax/Charcoal cartridges. The triplicate two-hour runs for $O_2$, $CO_2$, $SO_2$, $NO_X$, CO and total hydrocarbons were conducted in accordance with EPA Methods 3A, 6C, 7E, 10 and 25A. In addition, the exhaust gas volumetric flowrate was measured according to EPA Methods 1 , 2, 3A and 4.

Emission samples were collected from the fifty-four (54) inch diameter exhaust stack over the period of a single day. The Method 0030 cartridges were analyzed by Research Triangle Laboratories (RTL) of Research Triangle Park, North Carolina. The results are summarized and discussed in the subsections below.

### 2.1 Volatile Organic Compounds

With the exception of Run No. 4, the majority of the forty-two target compounds were below or only marginally above the minimum quantification limit (MQL). Table 2-1 presents the entire compound list and includes the measured emission concentrations of compounds which were above the MQL. Table 2-2 presents a summary of the mass emission rates for these compounds; complete data is included in Appendix A. Table 2-3 presents a summary of the average emission concentrations by test. As shown in these tables, six samples (Runs No. 7 through 12) contained no target compounds in the sorbent traps. Of the remaining six samples, four samples (Runs No. 1,2,3 and 6) contained only methylene chloride in the sorbent traps at levels only slightly above the MQL.

# TABLE 2-1
## VOLATILE ORGANIC COMPOUNDS EMISSION CONCENTRATION SUMMARY

### OYSTER BAY SOLID WASTE DISPOSAL COMPLEX
### NOVEMBER 10, 1992

| | EMISSION CONCENTRATION (UG/DSCM) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE ID | O-1 | O-2 | O-3 | O-4 | O-5 | O-6 | O-7 | O-8 | O-9 | O-10 | O-11 | O-12 |
| **TARGET COMPOUNDS** | | | | | | | | | | | | |
| ACETONE | | | | | | | | | | | | |
| BENZENE | | | | 2.74 | | | | | | | | |
| BROMODICHLOROMETHANE | | | | | | | | | | | | |
| BROMOFORM | | | | | | | | | | | | |
| BROMOMETHANE | | | | | | | | | | | | |
| 2-BUTANONE | | | | | | | | | | | | |
| CARBON DISULFIDE | | | | 39.54 | 2.46 | | | | | | | |
| CARBON TETRACHLORIDE | | | | | | | | | | | | |
| CHLOROETHANE | | | | | | | | | | | | |
| CHLOROBENZENE | | | | | | | | | | | | |
| CHLOROFORM | | | | | | | | | | | | |
| CHLOROMETHANE | | | | | | | | | | | | |
| DIBROMOCHLOROMETHANE | | | | | | | | | | | | |
| 1,2-DICHLOROBENZENE | | | | | | | | | | | | |
| 1,3-DICHLOROBENZENE | | | | | | | | | | | | |
| 1,4-DICHLOROBENZENE | | | | | | | | | | | | |
| 1,1-DICHLOROETHANE | | | | | | | | | | | | |
| 1,2-DICHLOROETHANE | | | | | | | | | | | | |
| 1,1-DICHLOROETHENE | | | | | | | | | | | | |
| 1,2-DICHLOROETHENE (trans) | | | | | | | | | | | | |
| 1,2-DICHLOROPROPANE | | | | | | | | | | | | |
| 1,3-DICHLOROPROPENE (cis) | | | | | | | | | | | | |
| 1,3-DICHLOROPROPENE (trans) | | | | | | | | | | | | |
| ETHYL BENZENE | | | | | | | | | | | | |
| 2-HEXANONE | | | | | | | | | | | | |
| 4-METHYL-2-PENTANONE | | | | | | | | | | | | |
| METHYLENE CHLORIDE | 2.27 | 1.26 | 1.15 | 1.85 | 1.61 | 1.47 | | | | | | |
| STYRENE | | | | | | | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | | | | | | | | | | | | |
| TETRACHLOROETHENE | | | | | | | | | | | | |
| TOLUENE | | | | 9.49 | | | | | | | | |
| 1,1,1-TRICHLOROETHANE | | | | 3.06 | | | | | | | | |
| 1,1,2-TRICHLOROETHANE | | | | | | | | | | | | |
| TRICHLOROETHENE | | | | | | | | | | | | |
| TRICHLOROFLUOROMETHANE | | | | | | | | | | | | |
| VINYL CHLORIDE | | | | | | | | | | | | |
| TOTAL XYLENES | | | | | | | | | | | | |
| **TENTATIVELY IDENTIFIED COMPOUNDS** | | | | | | | | | | | | |
| BENZALDEHYDE | | | | | | | | | | | | |
| 2-CHLOROETHYL VINYL ETHER | | | | | | | | | | | | |
| 1,2-DICHLOROETHENE (cis) | | | | | | | | | | | | |
| FREON 13 | | | | | | | | | | | | |
| VINYL ACETATE | | | | | | | | | | | | |

*BLANK SPACES IN THE TABLE INDICATE MEASURED EMISSIONS ARE BELOW THE MQL OF 1.1 UG/DSCM
**NON-TARGET COMPOUNDS WERE ALL BELOW MQL OF 1.1 UG/DSCM

TABLE 2-2
VOLATILE ORGANIC COMPOUNDS MASS EMISSION RATE SUMMARY

OYSTER BAY SOLID WASTE DISPOSAL COMPLEX
NOVEMBER 10, 1992

| | MASS EMISSION RATE (POUNDS/HOUR) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE ID | O-1 | O-2 | O-3 | O-4 | O-5 | O-6 | O-7 | O-8 | O-9 | O-10 | O-11 | O-12 |
| TARGET COMPOUNDS | | | | | | | | | | | | |
| ACETONE | | | | | | | | | | | | |
| BENZENE | | | | 3.08E-05 | | | | | | | | |
| BROMODICHLOROMETHANE | | | | | | | | | | | | |
| BROMOFORM | | | | | | | | | | | | |
| BROMOMETHANE | | | | | | | | | | | | |
| 2-BUTANONE | | | | | | | | | | | | |
| CARBON DISULFIDE | | | | 4.44E-04 | 2.12E-05 | | | | | | | |
| CARBON TETRACHLORIDE | | | | | | | | | | | | |
| CHLOROETHANE | | | | | | | | | | | | |
| CHLOROBENZENE | | | | | | | | | | | | |
| CHLOROFORM | | | | | | | | | | | | |
| CHLOROMETHANE | | | | | | | | | | | | |
| DIBROMOCHLOROMETHANE | | | | | | | | | | | | |
| 1,2-DICHLOROBENZENE | | | | | | | | | | | | |
| 1,3-DICHLOROBENZENE | | | | | | | | | | | | |
| 1,4-DICHLOROBENZENE | | | | | | | | | | | | |
| 1,1-DICHLOROETHANE | | | | | | | | | | | | |
| 1,2-DICHLOROETHANE | | | | | | | | | | | | |
| 1,1-DICHLOROETHENE | | | | | | | | | | | | |
| 1,2-DICHLOROETHENE (trans) | | | | | | | | | | | | |
| 1,2-DICHLOROPROPANE | | | | | | | | | | | | |
| 1,3-DICHLOROPROPENE (cis) | | | | | | | | | | | | |
| 1,3-DICHLOROPROPENE (trans) | | | | | | | | | | | | |
| ETHYL BENZENE | | | | | | | | | | | | |
| 2-HEXANONE | | | | | | | | | | | | |
| 4-METHYL-2-PENTANONE | | | | | | | | | | | | |
| METHYLENE CHLORIDE | 2.55E-05 | 1.41E-05 | 1.29E-05 | 2.07E-05 | 1.38E-05 | 1.26E-05 | | | | | | |
| STYRENE | | | | | | | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | | | | | | | | | | | | |
| TETRACHLOROETHENE | | | | | | | | | | | | |
| TOLUENE | | | | 1.07E-04 | | | | | | | | |
| 1,1,1-TRICHLOROETHANE | | | | 3.43E-05 | | | | | | | | |
| 1,1,2-TRICHLOROETHANE | | | | | | | | | | | | |
| TRICHLOROETHENE | | | | | | | | | | | | |
| TRICHLOROFLUOROMETHANE | | | | | | | | | | | | |
| VINYL CHLORIDE | | | | | | | | | | | | |
| TOTAL XYLENES | | | | | | | | | | | | |
| TENTATIVELY IDENTIFIED COMPOUNDS | | | | | | | | | | | | |
| BENZALDEHYDE | | | | | | | | | | | | |
| 2-CHLOROETHYL VINYL ETHER | | | | | | | | | | | | |
| 1,2-DICHLOROETHENE (cis) | | | | | | | | | | | | |
| FREON 13 | | | | | | | | | | | | |
| VINYL ACETATE | | | | | | | | | | | | |

*BLANK SPACES IN THE TABLE INDICATE MEASURED EMISSIONS ARE BELOW THE MQL OF 1.2 x E10-5 POUNDS/HOUR
**NON-TARGET COMPOUNDS WERE ALL BELOW MQL OF 1.2 x E10-5 POUNDS/HOUR

TABLE 2-3
VOLATILE ORGANIC COMPOUND TEST SUMMARY

OYSTER BAY SOLID WASTE DISPOSAL COMPLEX
NOVEMBER 10, 1992

| | EMISSION CONCENTRATION (UG/DSCM) | | |
|---|---|---|---|
| TEST ID | 1 | 2 | 3 |
| TARGET COMPOUNDS | | | |
| ACETONE | | | |
| BENZENE | | | |
| BROMODICHLOROMETHANE | | | |
| BROMOFORM | | | |
| BROMOMETHANE | | | |
| 2-BUTANONE | | | |
| | | | |
| CARBON DISULFIDE | | | |
| CARBON TETRACHLORIDE | | | |
| CHLOROETHANE | | | |
| CHLOROBENZENE | | | |
| CHLOROFORM | | | |
| CHLOROMETHANE | | | |
| | | | |
| DIBROMOCHLOROMETHANE | | | |
| 1,2-DICHLOROBENZENE | | | |
| 1,3-DICHLOROBENZENE | | | |
| 1,4-DICHLOROBENZENE | | | |
| | | | |
| 1,1-DICHLOROETHANE | | | |
| 1,2-DICHLOROETHANE | | | |
| 1,1-DICHLOROETHENE | | | |
| 1,2-DICHLOROETHENE (TRANS ISOMER) | | | |
| 1,2-DICHLOROPROPANE | | | |
| 1,3-DICHLOROPROPENE (cis) | | | |
| 1,3-DICHLOROPROPENE (trans) | | | |
| | | | |
| ETHYL BENZENE | | | |
| 2-HEXANONE | | | |
| 4-METHYL-2-PENTANONE | | | |
| METHYLENE CHLORIDE | 1.56 | | |
| STYRENE | | | |
| | | | |
| 1,1,2,2-TETRACHLOROETHANE | | | |
| TETRACHLOROETHENE | | | |
| TOLUENE | | | |
| 1,1,1-TRICHLOROETHANE | | | |
| 1,1,2-TRICHLOROETHANE | | | |
| TRICHLOROETHENE | | | |
| TRICHLOROFLUOROMETHANE | | | |
| | | | |
| VINYL CHLORIDE | | | |
| TOTAL XYLENES | | | |
| | | | |
| TENTATIVELY IDENTIFIED COMPOUNDS | | | |
| BENZALDEHYDE | | | |
| 2-CHLOROETHYL VINYL ETHER | | | |
| 1,2-DICHLOROETHENE (cis) | | | |
| FREON 13 | | | |
| VINYL ACETATE | | | |

*BLANK SPACES IN THE TABLE INDICATE MEASURED EMISSIONS ARE BELOW THE MQL OF 1.1UG/DSCM
**NON-TARGET COMPOUNDS WERE ALL BELOW MQL OF 1.1UG/DSQM

These ten VOST runs demonstrated that VOC emissions were below or only slightly above the following minimum quantification limits:

| Compounds | Concentration MQL (ug/dscm) | Emission Rate MQL (lbs/hour) |
|---|---|---|
| target compounds | 1.1 | $1.2 \times 10^{-5}$ |
| non-target compounds | 1.1 | $1.2 \times 10^{-5}$ |

The results of Runs No. 4 and 5 were inconsistent with the other ten runs and results were not used to calculate test averages. Run No. 4 contained some quantities of carbon disulfide, methylene chloride, benzene, toluene and 1, 1, 1-trichloroethane and Run No. 5 contained low levels of carbon disulfide and methylene chloride. The field blank and trip blanks contained no target compounds indicating that the results of Samples 4 and 5 were not due to laboratory or handling contamination. Sampling contamination may have occurred from the engine exhaust from the electric generating facility that is adjacent to the blower station.

No additional peaks, other than the target compounds discussed above, were detected in the sorbent traps. As a result, there was no tentative identification and semi-quantification of unknowns. These data indicate VOC emissions in general are below minimum quantification limits.

In addition to the analysis of the twelve VOST sorbent traps, aqueous condensate was collected for each set of four samples. These three condensate samples were also analyzed and no target peaks were above the MQL. It can be concluded that no significant amounts of target VOCs were trapped in the condensate and that the sorbent trap pairs were representative of actual target compound emissions.

In summary, all samples, with the exception of sample four, contained quantities either below or only slightly above the minimum quantification limits of the target and non-target compounds. Samples No. 4 and 5 contained target compounds, but as discussed previously, may have been the result of sampling contamination from the adjacent generator station.

## 2.2 Continuous Emissions Monitoring Summary

The results of the three two-hour runs for $NO_X$, $SO_2$, THC, $O_2$, and $CO_2$ are summarized in Table 2-4. The results were consistent over the three runs. The emission concentrations of $NO_X$ averaged 18.2 ppm, $SO_2$ averaged 2.0 ppm and CO averaged 3.2 ppm. The average mass emission rates of NOx, $SO_2$ and CO were 0.320, 0.0547, and 0.0361 lbs/hour, respectively. Total hydrocarbons were barely detectable with an average emission concentration of 1.0 ppm and mass emission rate of 0.0187 lbs/hour. Oxygen and carbon dioxide concentrations averaged 9.6% and 9.9% respectively.

## 2.3 Volumetric Flowrate, Moisture and Molecular Weight

Complete results are summarized in Table 2-5 for three tests. The volumetric flowrate averaged 2,450 DSCFM and the moisture averaged 10.3%

**TABLE 2-4**
**CONTINUOUS EMISSIONS MONITORING SUMMARY**

**OYSTER BAY SOLID WASTE DISPOSAL COMPLEX**
**NOVEMBER 10, 1992**

| TEST NUMBER | | 1 | 2 | 3 | AVERAGE |
|---|---|---|---|---|---|
| SAMPLING TIME | UNITS | 120 min | 120 min | 120 min | 120 min |
| CLOCK TIME | | 0930-1130 | 1330-1530 | 1652-1852 | |
| VOLUMETRIC FLOW RATE | (dscfm) | 2970 | 2410 | 1970 | 2450 |
| EMISSION CONCENTRATION | | | | | |
| Oxygen | (%) | 9.5 | 9.5 | 9.7 | 9.6 |
| Carbon Dioxide | (%) | 10.0 | 9.9 | 9.8 | 9.9 |
| Carbon Monoxide | (ppm) | 4.1 | 3.6 | 2.0 | 3.2 |
| Nitrogen Oxides | (ppm) | 18.6 | 18.1 | 17.8 | 18.2 |
| Sulfur Dioxide | (ppm) | 3.6 | 2.3 | 0.1 | 2.0 |
| Total Hydrocarbons | (ppm) | 2.2 | 0.6 | 0.1 | 1.0 |
| MASS EMISSION RATES | | | | | |
| Carbon Monoxide | (lb/hr) | 5.31E-02 | 3.78E-02 | 1.72E-02 | 3.61E-02 |
| Nitrogen Oxides | (lb/hr) | 3.96E-01 | 3.13E-01 | 2.51E-01 | 3.20E-01 |
| Sulfur Dioxides | (lb/hr) | 1.07E-01 | 5.54E-02 | 1.97E-03 | 5.47E-02 |
| Total Hydrocarbons | (lb/hr) | 4.49E-02 | 9.94E-03 | 1.35E-03 | 1.87E-02 |

**TABLE 2-5**
**VOLUMETRIC FLOWRATE, MOISTURE, AND MOLECULAR WEIGHT SUMMARY**

**OYSTER BAY SOLID WASTE DISPOSAL COMPLEX**
**NOVEMBER 10, 1992**

| | | | | | |
|---|---|---|---|---|---|
| TEST DATE | | 11/10/92 | 11/10/92 | 11/10/92 | |
| TEST NUMBER | UNITS | 1 | 2 | 3 | AVERAGE |
| CLOCK TIME | | 0930-1030 | 1320-1420 | 1655-1755 | |
| DRY GAS METER CAL FACTOR, Y | -- | 1 | 1 | 1 | 1 |
| INITIAL METER VOLUME, Vi | ft3 | 52.880 | 89.040 | 128.470 | |
| | | | | | |
| VOLUME BEFORE INTER LEAK CHECK | ft3 | 0 | 0 | 0 | |
| VOLUME AFTER INTER LEAK CHECK | ft3 | 0 | 0 | 0 | |
| FINAL METER VOLUME, Vf | ft3 | 88.870 | 128.150 | 167.990 | |
| LEAK CHECK CORRECTION, Lp | cfm | 0 | 0 | 0 | |
| TOTAL METER VOLUME, Vm | ft3 | 35.990 | 39.110 | 39.520 | 38.207 |
| SAMPLING TIME | min | 60 | 60 | 60 | 60 |
| | | | | | |
| VOLUME OF LIQUID COLLECTED, Vwc | mL | 50 | 100 | 97 | |
| SILICA GEL WEIGHT INCREASE, Vwsg | g | 25 | 7.3 | 6.4 | |
| TOTAL WATER COLLECTED, Vlc | mL | 75 | 107.3 | 103.4 | 95.2 |
| | | | | | |
| BAROMETRIC PRESSURE, Pbar | in. Hg | 29.87 | 29.87 | 29.87 | 29.87 |
| ORIFICE PRESSURE DROP (AVG), ■H | in. H2O | 1.25 | 1.5 | 1.5 | 1.4 |
| STACK STATIC PRESSURE, Pg | in. H2O | 0 | 0 | 0 | 0 |
| STACK TEMPERATURE, Ts | :::F | 1655 | 1630 | 1645 | 1643 |
| TEMPERATURE OF METER, Tm | :::F | 57 | 61 | 56 | 58 |
| | | | | | |
| | | | | | |
| DIAMETER OF STACK, Ds | inches | 54 | 54 | 54 | 54 |
| WIDTH OF STACK, W | inches | 0 | 0 | 0 | 0 |
| LENGTH OF STACK, L | inches | 0 | 0 | 0 | 0 |
| PITOT TUBE COEFFICIENT, Cp | -- | 0.84 | 0.84 | 0.84 | 0.84 |
| AVG SQUARE ROOT OF ■p | -- | 0.12 | 0.10 | 0.08 | 0.10134241 |
| | | | | | |
| STACK GAS ANALYSIS OXYGEN | % | 9.5 | 9.5 | 9.7 | 9.6 |
| CARBON DIOXIDE | % | 10 | 9.9 | 9.8 | 9.9 |
| NITROGEN | % | 80.5 | 80.6 | 80.5 | 80.5 |
| CARBON MONOXIDE | ppm | 4.1 | 3.6 | 2 | 3.2 |
| MOISTURE CONTENT | % | 8.8 | 11.3 | 10.7 | 10.3 |
| MOISTURE CONTENT @ SATURATION | % | 96.3 | 96.3 | 96.3 | 96.3 |
| EPA METHOD 4 RUN OK? | | YES | YES | YES | YES |
| TOTAL METER VOLUME (dry,std), Vmstd | dscf | 36.793 | 39.699 | 40.504 | 38.999 |
| MOLECULAR WT OF DRY STACK GASES, Md | lb/lb-mole | 29.98 | 29.96 | 29.96 | 29.97 |
| MOLECULAR WT OF WET STACK GASES, Ms | lb/lb-mole | 28.93 | 28.61 | 28.67 | 28.74 |
| STACK VELOCITY, vs | ft/s | 13.67 | 11.27 | 9.22 | 11.39 |
| STACK AREA, As | ft2 | 15.90 | 15.90 | 15.90 | 15.90 |
| | | | | | |
| STACK FLOW, Qsd | dscfs | 49.5 | 40.1 | 32.8 | 40.8 |
| STACK FLOW, Qsd | dscfm | 2970 | 2410 | 1970 | 2450 |
| STACK FLOW, Qsd | dscfh | 178,200 | 144,600 | 118,200 | 147000 |
| STACK FLOW, Qsd | dscmm | 84.1 | 68.2 | 55.8 | 69.4 |

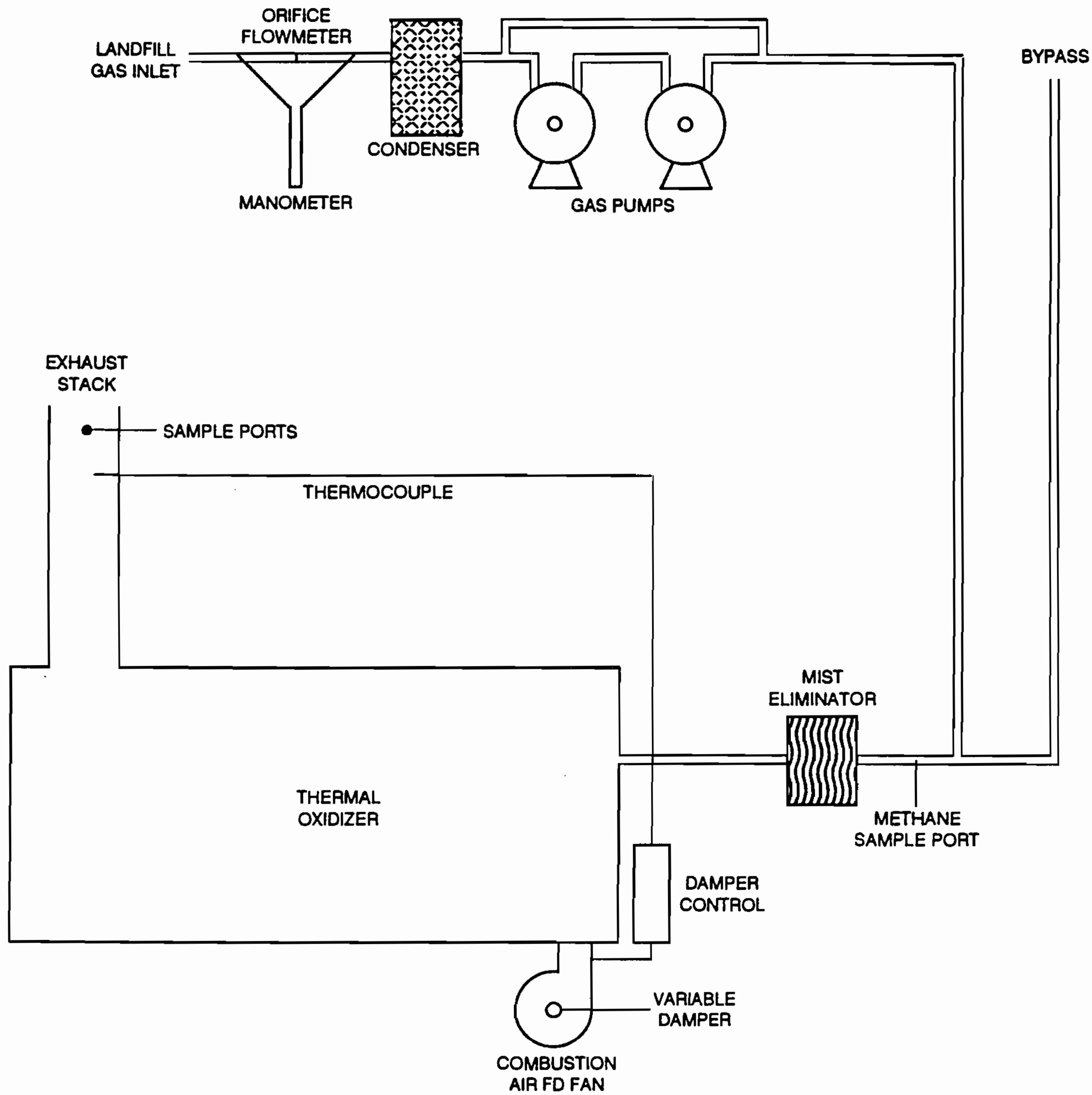
## 3.0 PROCESS DESCRIPTION

The Old Bethpage landfill is equipped with a gas control system that pumps low heat content landfill gas (approximately 20% methane) from perimeter wells to a thermal oxidizer. The landfill gas control system utilizes a network of extraction wells, collection header piping and blowers to create a subterranean vacuum which ventilates the surrounding soils and prevents off-site migration of landfill gas (LFG). The collected gases are oxidized by high temperature incineration to reduce landfill emissions of volatile organic compounds and odor contaminants.

The thermal oxidizer was operated at normal conditions during the emission testing. The oxidizer exhaust gas temperature was set at the normal set-point of 1600 °F. A schematic of the LFG gas recovery system and thermal oxidizer is presented in Figure 3-1.

Gas collection begins with twenty-four (24) wells each approximately thirty-five (35) feet in depth. The wells are equipped with shutoff valves, sampling ports and access flares. Average gas flow from each well is 2.4 cubic feet per minute (cfm) per foot of well screen. Minimum flow is 0.3 cfm. The wells are connected to a collection header consisting of approximately 6,500 feet of 10 inch pipe.

The interior surfaces of the header are cooler than the bulk temperature of the gas, which causes condensation to form as the gas cools to a new, lower saturation temperature. The pipe is sloped to a condensate collection system consisting of three (3) condensate collection wells, two (2) water separators and a




NOT TO SCALE

**TRC**
TRC Environmental Corporation

5 Waterside Crossing
Windsor, CT 06095
(203) 289-8631

OYSTER BAY SOLID WASTE DISPOSAL COMPLEX

FIGURE 3-1

**LANDFILL GAS THERMAL OXIDIZER PROCESS SCHEMATIC**

| | |
|---|---|
| Date: 10/92 | Drawing No. 12304-E71 |

demister with pads to remove condensed moisture from the LFG. Condensate production is estimated to be 135 gallons per day (gpd) at a gas flow of 100 cfm in winter and 91 gpd at 100 cfm in summer.

The LFG is drawn through the system by dual Rotron DR10 regenerative independently controlled blowers providing vacuum at the individual well-heads under variable suction and flow conditions. A second set of blowers are always on stand-by. A manometer measures pressure drop across an orifice calibrated to determine the gas volumetric flowrate. Blower 1 is rated for 125-960 cfm while Blower 2 is rated for 500-960 cfm at 1.7 - 3.4 psig. The blowers also provide pressure on their exit side to move the gas through the discharge piping to the thermal oxidizer. Between the blowers and the thermal oxidizer are an emergency bypass stack and a Koch flexi-chevron mist eliminator as a final remover of entrained droplets.

The John Zink Company thermal oxidizer is rated for 500-2,000 cfm with an exhaust gas temperature of 1400 to 1800 °F and a 0.3 second retention time. The pilot can be fueled with either propane or LFG. The unit is equipped with an automatic LFG safety valve that is activated by either an LFG header problem or a flame-out condition. Header problems are detected by a feedline differential pressure switch when the pressure measures less than 10 or greater than 25 inches of water column. Flame-out conditions are detected with ultraviolet sensitive flame scanners.

The oxidizer is equipped with a Buffalo Forge size 600 combustion air blower. A variable flow inlet damper is regulated automatically with a Honeywell damper control keyed to stack temperature. The controller is typically set at 1600 °F.

The quantity and composition of the LFG are highly variable. The design flowrate can range from 500 to 2000 cfm at 20% to 40% methane by volume. Carbon dioxide ranges from 15% to 40% and air ranges from 30% to 60%. The carbon dioxide content of the exhaust gas is significantly lower due to the dilution from the combustion air. The hydrogen sulfide concentration range is 0-500 ppm and the relative humidity is 100%.

Oxidizer operating parameters monitored during the test program included: LFG flowrate, LFG methane content as measured by an MSA combustible gas analyzer, burner temperature (exhaust) and the position of the variable damper on the combustion air fan. A summary of the averages of these measurements are included in Table 3-1. These data indicate that the process was operating at a steady rate.

**TABLE 3-1**
**THERMAL OXIDIZER OPERATIONS SUMMARY**

**OYSTER BAY SOLID WASTE DISPOSAL COMPLEX**
**NOVEMBER 10, 1992**

| TEST NUMBER | UNITS | 1 | 2 | 3 | AVG |
|---|---|---|---|---|---|
| SAMPLING TIME | (min) | 120 | 120 | 120 | 120 |
| CLOCK TIME | | 0930-1200 | 1330-1600 | 1700-1900 | |
| PARAMETER | | | | | |
| Flowrate | (cfm) | 860 | 860 | 860 | 860 |
| Methane | (%) | 20 | 20 | 20 | 20 |
| Burner Temperature | (deg F) | 1604 | 1601 | 1597 | 1602 |
| Burner Damper | (% closed) | 93.3 | 92.6 | 91.7 | 92.6 |

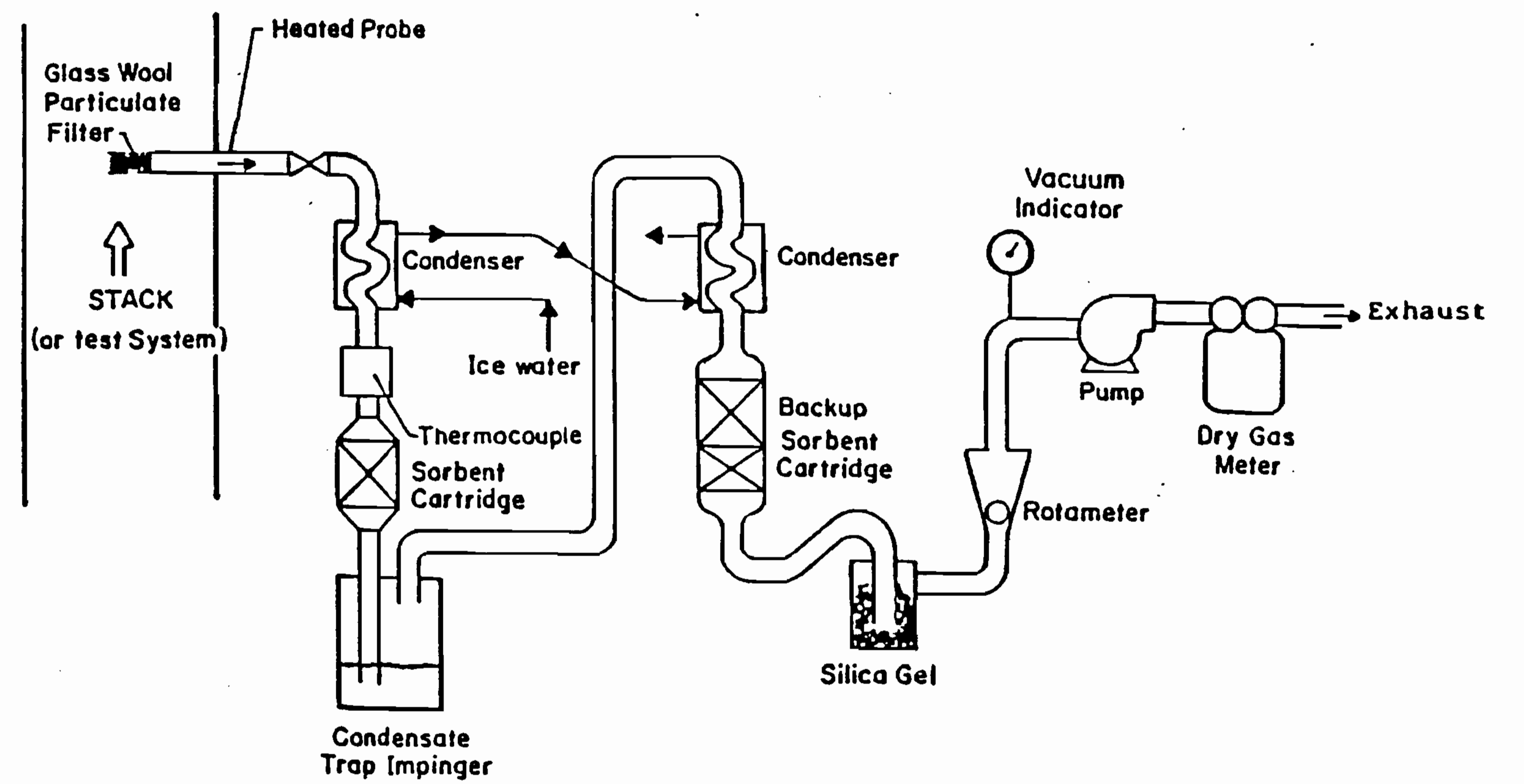
## 4.0 SAMPLING AND ANALYTICAL METHODS

### 4.1 Volatile Organic Sampling Train (VOST)

Sampling was performed to determine the emission rates of Volatile Organic Compounds (VOCs) by utilizing the EPA SW 846 Method 0030 (VOST). The "slow" VOST option was used which required forty minute runs at a sampling rate of 0.5 lpm. Three (3), 40-minute samples were required to constitute a test series. TRC collected a fourth sample for each test.

#### Sample Collection

A twenty (20) liter "nominal" sample of effluent gas containing VOCs was withdrawn from the source at a flow rate of approximately 0.5 liters per minute for 40 minutes, using a heated ≥265°F glass lined probe and a VOST sampling train. A schematic of the train is shown in Figure 4-1. The gas stream was cooled to less than or equal to 20°C by passage through a water cooled condenser, and the volatile organics were collected on a pair of sorbent resin traps. Liquid condensate was collected in an impinger placed between the two resin traps. The first resin trap (front trap) contained approximately two grams of Tenax and the second trap contained one gram each of Tenax and petroleum based charcoal, 3:1 by volume. A total of four pairs of sorbent traps were used to collect VOCs from the effluent gas stream, one pair for each of the three runs plus one spare pair in the event of sampling or analytical problems.





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OYSTER BAY SOLID WASTE DISPOSAL COMPLEX

FIGURE 4-1

**SCHEMATIC OF VOLATILE ORGANIC SAMPLING TRAIN (VOST)**

| Date: | Drawing No. |
| --- | --- |

All sample cartridges were sealed with Swagelok fittings and kept on ice until ready for analysis. Condensate was recovered in a 40ml VOA vial and combined for each series of quadruplicate runs. A total of three condensate samples were analyzed. Only a few milliliters were collected from the three runs since most of the moisture was absorbed by the Tenax.

<u>Sample Analysis</u>

Sample analysis was performed by Research Triangle Laboratories in Durham, North Carolina. The contents of the paired sorbent cartridges were spiked with an internal standard and thermally desorbed for ten (10) minutes at 180°C with organic free nitrogen gas, bubbled through five (5) ml of organic free water and trapped on an analytical absorbent trap. After the 10 minute desorption, the analytical absorbent trap was rapidly heated to 180°C with the carrier gas flow reversed so that the effluent flow from the analytical trap was directed into the gas chromatograph/mass spectrometer (GC/MS). The volatile compounds were separated by temperature programmed gas chromatography and detected by low resolution mass spectrometry. The concentrations of volatile compounds were calculated using the internal standard technique. Condensate samples were analyzed in a similar manner. Each pair of sample cartridges was analyzed together as a pair. Separate analysis of Tenax and Tenax charcoal cartridges was not required for the low emission concentrations of the thermal oxidizer.

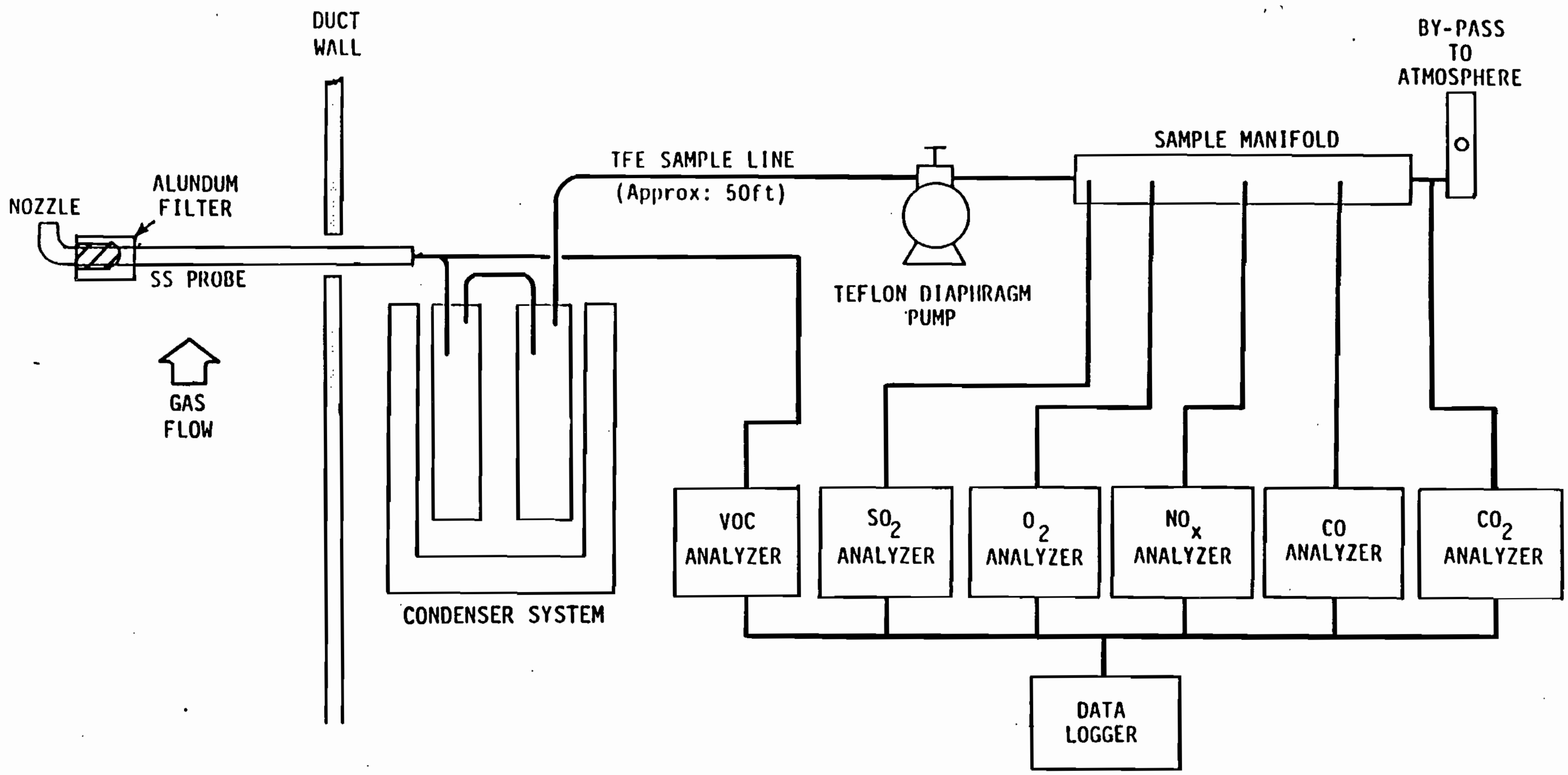
## 4.2 Continuous Emissions Monitoring of $O_2$, $CO_2$, $SO_2$, $NO_x$, CO, and Total Hydrocarbons (THC)

Continuous emission monitoring (CEM) was performed at the exhaust of the thermal oxidizer to determine the concentrations of $O_2$, $CO_2$ $SO_2$, $NO_x$, CO, and THC. A schematic of the CEM system is presented in Figure 4-2. Emissions were measured continuously during three (3) test periods, with each test period being two (2) hours in length.

All CEM data was recorded as five (5) minute averages by a Yokagawa Model 2400 automatic digital data logger. The CEM system was housed in the TRC Mobile Environmental Laboratory (MEL) at the base of the unit.

### Sample Conditioning System

An in-stack Alundum thimble filter with a stainless steel nozzle facing away from the stack gas flow served to remove large particulate matter from the sample gas stream. The thimble filter was mounted on the end of a heated (250° ± 25°F) stainless steel sampling probe. The sample stream was drawn through heated (250° ± 25°F) Teflon sample line and through a sample conditioner to remove the moisture from the gas stream. The sample was then drawn through Teflon tubing by a leak-free Teflon double diaphragm pump to a stainless steel sample manifold with an atmospheric by-pass rotameter. The $NO_x$, $SO_2$, $O_2$, $CO_2$, and CO analyzers drew samples from the manifold. The total hydrocarbon analyzer drew from the heated sample line prior to the condenser system.




TRC

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(203) 289-8631

OYSTER BAY SOLID WASTE DISPOSAL COMPLEX

FIGURE 4-2
**EPA METHOD 3A, 6C, 7E, 10 & 25A CONTINUOUS EMISSION MONITORING SYSTEM**

## Continuous Emissions Analyzers

Emission parameters monitored continuously were $O_2$, $CO_2$, $SO_2$, $NO_x$, CO, and THC. Oxygen and carbon dioxide concentrations were measured in accordance with EPA Method 3A. EPA Method 6C was used to measure $SO_2$ concentrations. Nitrogen oxide emissions were measured utilizing EPA Method 7E. Carbon monoxide concentration was measured in accordance with EPA Method 10. Total hydrocarbon concentrations were measured using EPA Method 25A.

A Horiba Model PMA-200 Oxygen analyzer was used to determine concentrations of $O_2$ in the stack gas. This instrument utilizes the paramagnetic principle, whereby the magnetic susceptibility of a gas volume is measured by the force acting upon a non-magnetic test body suspended in a magnetic field. The force is converted to an output current proportional to the $O_2$ concentration.

An Infra-Red Industries, Inc. infrared $CO_2$ analyzer was used to monitor carbon monoxide emissions. This instrument operates on the principle of $CO_2$ having a known characteristic absorption spectra in the infrared range. Radiation absorbed by $CO_2$ in the sample cell produces a capacitance change in the detector which is proportional to the $CO_2$ concentration.

A Western Research Model 721 $SO_2$ analyzer was used to determine sulfur dioxide concentrations in the stack gas. This instrument utilizes the ultraviolet photometric principle, and was designed to meet the stringent requirements of the California Air Resources Board to ensure maximum accuracy and reliability, without $NO_x$ interference, in the 0-1000 ppm and 0-100 ppm ranges.

A Thermo-Electron Corporation Model 10A Chemiluminescent $NO/NO_x$ analyzer was used to determine $NO_x$ concentrations. The chemiluminescent reaction of NO and $O_3$ (ozone) provides the basis for the analytical method ($NO + O_3 \rightarrow NO_2 + O_2$ + light). A photomultiplier/electrometer/amplifier produces a current proportional to the NO concentration. The output of the amplifier provides a signal for direct readout on a meter indicator, or for outputs to a recorder of computer.

A Teco Model 48 non-dispersive infrared gas analyzer measured CO concentrations. The analyzer contains an infrared detector that uses the signal non-dispersive beam technique with alternate modulations of the sample and reference cells. Radiation absorbed by CO in the sample cell results in a capacitance change in the detector which is proportional to the CO concentration.

A Ratfisch Model RS55 THC analyzer utilizes a flame ionization detector to analyze and measure hydrocarbons $C_1$ through $C_{18}$ as carbon. This analyzer was used to determine exhaust VOC concentrations. A small amount of sample containing hydrocarbons is introduced to the system through a heated filter and sample line. By the use of a heated sample pump, the sample gas enters the heated detector bench where it is burned in a hydrogen-fueled flame to produce carbon ions and free electrons. The free electrons are attracted to a positive collector, and the resulting current is proportional to the number of carbon atoms introduced to the flame.

### Data Acquisition and Handling

All CEM data was monitored by a Yokagawa Model 2400 automatic data logger. Emissions data were "viewed" by the data logger every six seconds, averaged, and printed at five minute intervals. This enabled real-time emissions data to be available on-site.

### Continuous Emissions Monitoring System Calibration

Calibrations (zero and span) of the CEM system were performed at the beginning and end of each run period. Calibration gases were introduced to the system through a three-way valve at the back of the sample probe. EPA Protocol 1 calibration gases were used for $O_2$, $CO_2$, $SO_2$, $NO_x$ and CO analyzers. The THC analyzer was calibrated with $\pm 2\%$ certified methane standards. Each analyzer was multipoint calibrated prior to the test program to establish linearity of the instrument.

### 4.3 Volumetric Flowrate and Moisture Determination

The volumetric flowrate and moisture were determined at the sampling location in accordance with EPA Methods 1, 2, 3A and 4. Figures 4-3 and 4-4 show the configuration of the sampling ports and traverse points. The sampling ports were located 108" downstream and 26" upstream of the nearest flow disturbances. The duct was 54" in diameter.

Flowrate determinations were made with an S-type pitot tube connected with 50 feet of Tygon tubing to a 10 inch incline manometer. Temperature was measured with a type K thermocouple.

The moisture determination sampling train consisted of a stainless steel nozzle, heated glass lined probe, flexible sample

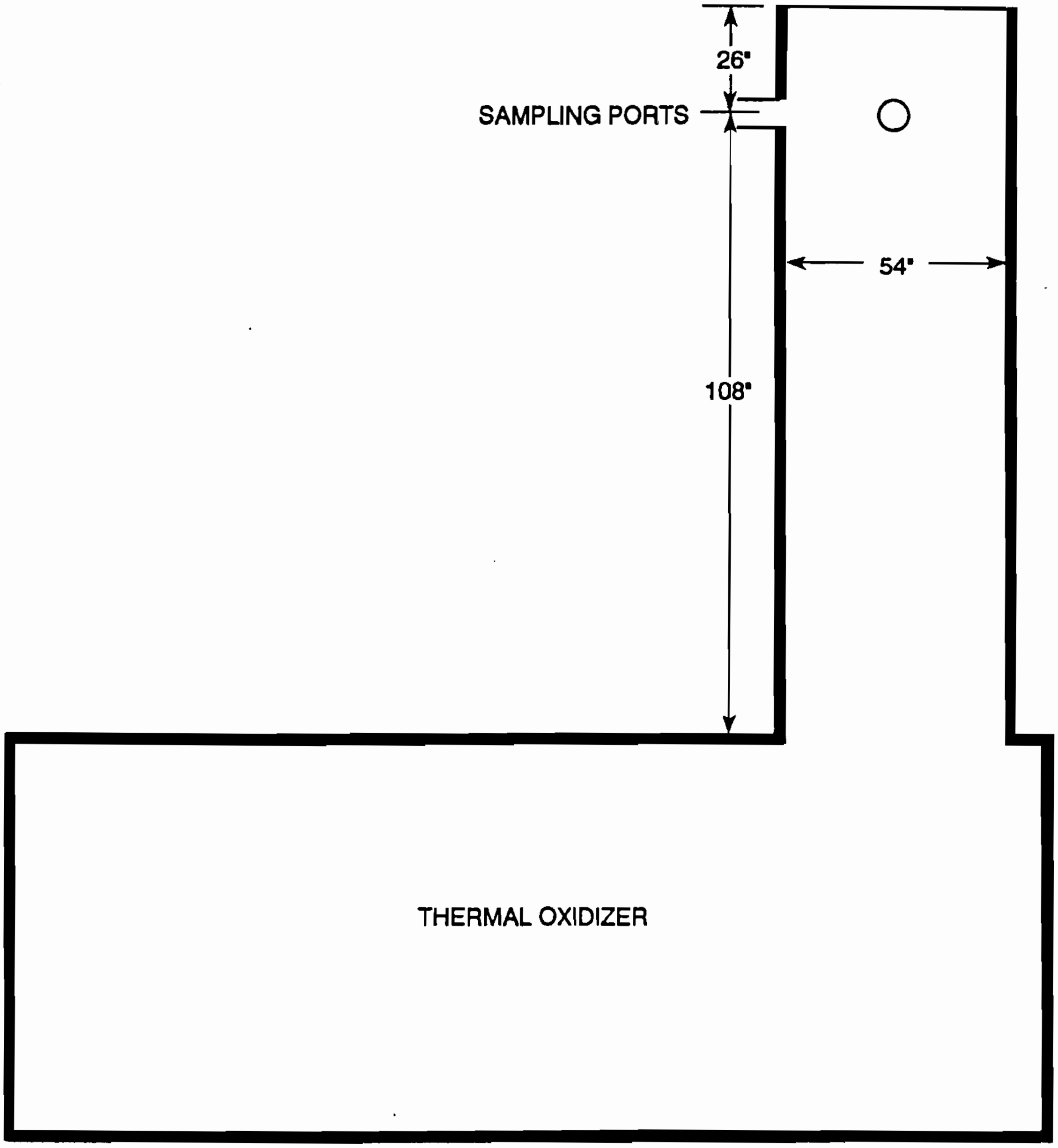


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**FIGURE 4-3.**
**THERMAL OXIDIZER SAMPLING PORTS**

| | |
|---|---|
| Date: 10/92 | Drawing No. 12304-E71 |

Figure 4-4

TRC Environmental Consultants, Inc.

**EPA Method 1**

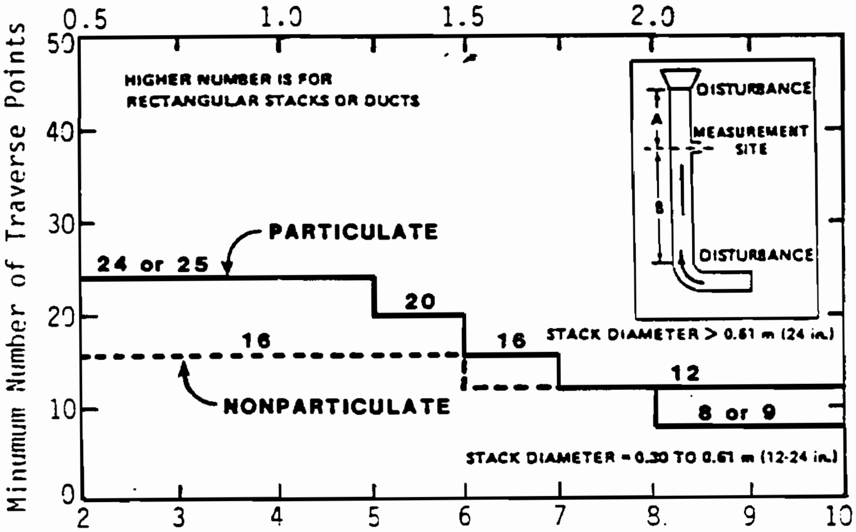
**Sample and Velocity Traverses for Stationary Sources**

Firm: LKB, Inc.
Location: LFG Thermal Oxidizer
Diameters Upstream: 2.0
Diameters Downstream: .5

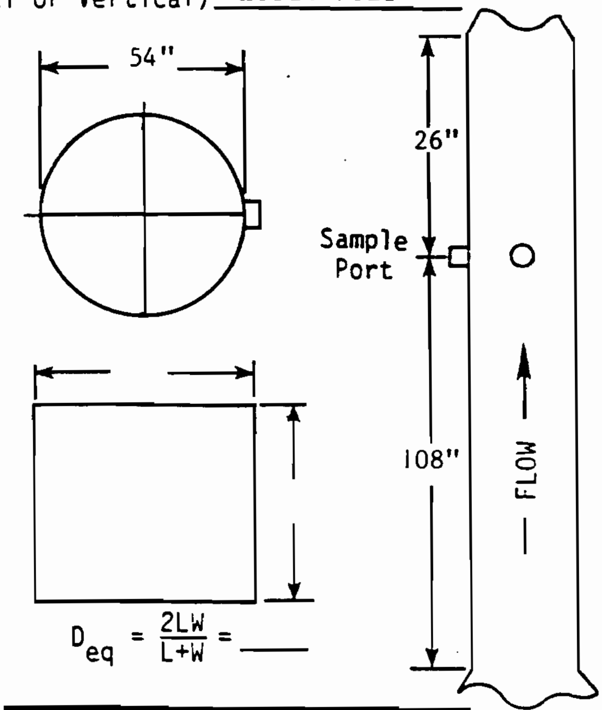
Total Traverse Points Required: 16
Number of Ports: 2
Points Per Port: 8
Traverse ( Horizontal or Vertical): Horizontal

MINIMUM NUMBER OF TRAVERSE POINTS FOR PARTICULATE AND NONPARTICULATE TRAVERSES

Duct Diameters Upstream from Flow Disturbance (Distance A)




Duct Diameters Downstream from Flow Disturbance (Distance B)




$D_{eq} = \frac{2LW}{L+W} =$ _____

LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS

| Point Number On A Diameter | (Percent of stack diameter from inside wall to traverse point) Number Of Traverse Points On A Diameter 4 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|
| 1 | 6.7 | 4.4 | 3.2 | 2.6 | 2.1 |
| 2 | 25.0 | 14.6 | 10.5 | 8.2 | 6.7 |
| 3 | 75.0 | 29.6 | 19.4 | 14.6 | 11.8 |
| 4 | 93.3 | 70.4 | 32.3 | 22.6 | 17.7 |
| 5 | | 85.4 | 67.7 | 34.2 | 25.0 |
| 6 | | 95.6 | 80.6 | 65.8 | 35.6 |
| 7 | | | 89.5 | 77.4 | 64.4 |
| 8 | | | 96.8 | 85.4 | 75.0 |
| 9 | | | | 91.8 | 82.3 |
| 10 | | | | 97.4 | 88.2 |
| 11 | | | | | 93.3 |
| 12 | | | | | 97.9 |

CROSS-SECTIONAL LAYOUT FOR RECTANGULAR STACKS

| Total Traverse Points | Matrix |
|---|---|
| 9 | 3x3 |
| 12 | 4x3 |
| 16 | 4x4 |
| 20 | 5x4 |
| 25 | 5x5 |

TRAVERSE POINT LOCATIONS

| No. | Distance From Wall | Nipple Size | Total Distance |
|---|---|---|---|
| 1 | 1.7" | | |
| 2 | 5.7" | | |
| 3 | 10.5" | | |
| 4 | 17.4" | | |
| 5 | 36.6" | | |
| 6 | 43.5" | | |
| 7 | 48.3" | | |
| 8 | 52.3" | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |

line, four condensing impingers, two with 100 ml water, one empty, and one with 200 g silica gel, a leak free pump, and dry gas meter. A schematic of the sampling train is shown in Figure 4-5. At the beginning and conclusion of each run, the train was leak checked and the volume of the water in the impingers was measured. The silica gel was recovered and then weighed at TRC to determine its weight gain.

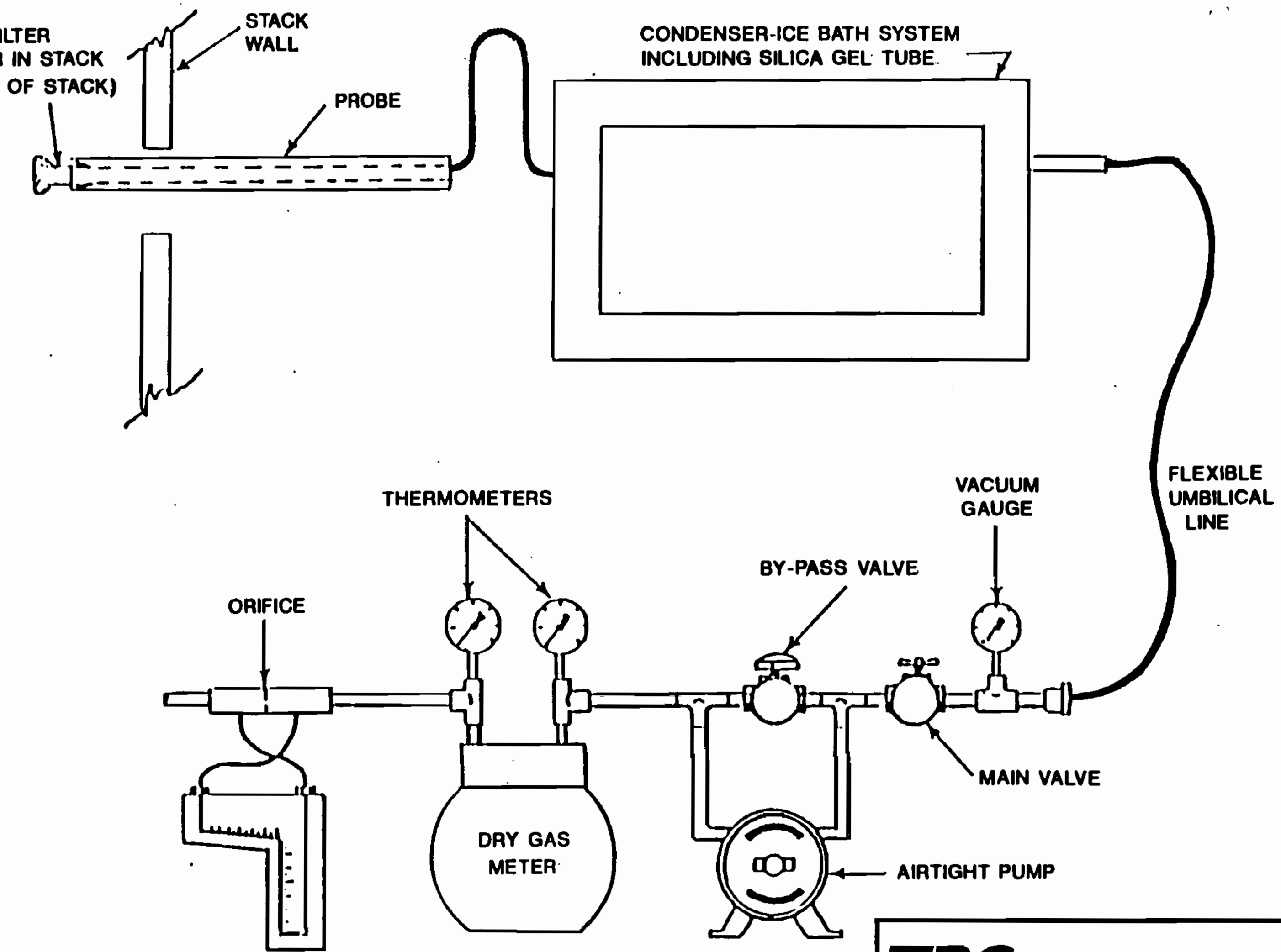



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Figure 4-5

**EPA METHOD 4 TRAIN**

## 5.0 QUALITY ASSURANCE

The quality assurance program is designed to ensure that emission measurement work is performed by qualified people using proper equipment following written procedures in order to provide accurate, defensible data. This program is based upon the EPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III (EPA-600/4-7-0271b).

### 5.1 Measurement Methods

Sampling and measurement equipment including continuous analyzers, recorders, pitot tubes, dry gas meters, orifice meters, thermocouples, and any other pertinent apparatus is uniquely identified, undergoes preventive maintenance, and was calibrated before and after the test program. Most calibrations were performed with standards traceable to the National Institute of Standards and Technology (NIST) or other appropriate references. These standards include wet test meters and NIST Standard reference Materials. Records of all calibration data are maintained in TRC files.

During the field runs, sampling performance and progress were continually evaluated, and deviations from sampling method criteria were reported to the Field Team Leader who then assessed the validity of the run. All field data was recorded on prepared data sheets. The Field Team Leader maintained a written log describing the events of each day. Field samples including field blanks were transported from the field in shock-proof, secure containers. Sample integrity was controlled through the use of prepared data sheets, positive sample identification, and chain-of custody forms as shown in Appendix D. All sampling trains were leak-checked before and after each run.

### 5.2 CEM System

The CEM system was calibrated and leak checked at the beginning and end of each test day. Calibration gases were Protocol I(±1%) or certified to ±2% for methane. Multipoint calibrations were performed on the analyzers prior to the field program to establish linearity.

### 5.3 Analysis

All sample preparation and sample analyses were performed at or under the direction of the TRC Environmental Laboratory. Standards of QA set forth in the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III (EPA-600/4-77-027b) were strictly followed.

In the analytical laboratory, all quality control samples including field blank samples and reagents were analyzed with the actual run samples. Blank values were subtracted from actual sample values.

The TRC Laboratory maintains a continuous QC program to monitor instrument response and analyst proficiency, and to ensure the precision and accuracy of all analytical results. This program has been developed in conjunction with EPA, NIOSH, and State regulatory agencies.

TRC participates in the audit program of the EPA Environmental Monitoring Systems Laboratory (source and ambient air) and the EPA

Environmental Monitoring and Support Laboratory (water). TRC analyzes on a scheduled basis standard QC samples. Audit results are reviewed by the Chemistry Laboratory Manager and the Emission Measurement Section Manager, and corrective action is initiated when acceptance criteria are not met.

During the data reduction process, all calculations were reviewed initially by a person intimately associated with the emission test group, and finally by a senior scientist or engineer not associated with the program. These QC checks provided a means to ensure that the calculations was performed correctly and that the data were reasonable.

## Laboratory Subcontractors-Research Trainqle Laboratories (RTL) of Research Trainqle Park, North Carolina

The subcontract laboratory was selected by TRC to provide analytical support not available at TRC. They offered state-of-the-art laboratory services and professional staff experience with the rigorous requirements of method development, sample analysis, and quality control.

RTL is well qualified to conduct analytical methods for a wide variety of compounds in diverse matrices and has extensive capabilities for analysis of a wide range of organic compounds is complex emission sample matrices. They have established an outstanding record of service to government and industry in providing high quality data, rapid turnaround, and flexibility to adapt to client's needs.

# APPENDIX A

# FIELD DATA FORMS

**TRC Environmental Consultants, Inc.**

# EPA Method 1

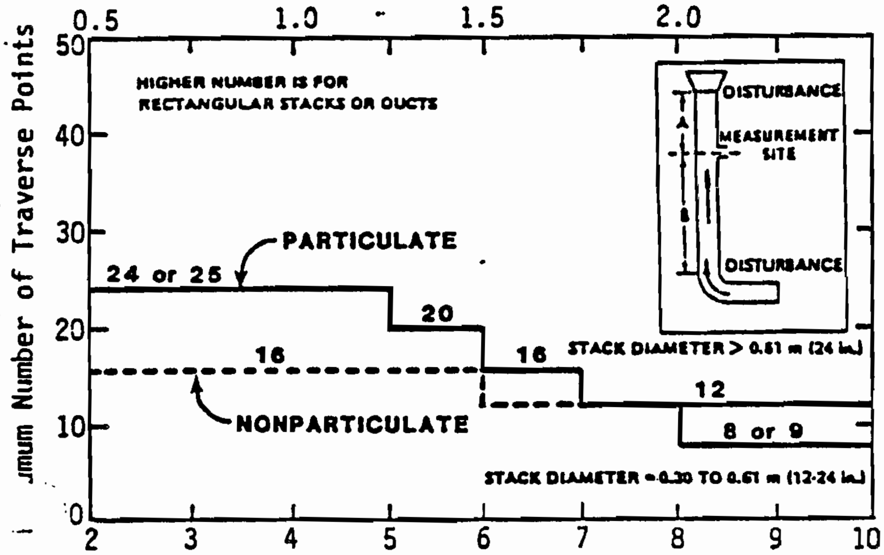
## Sample and Velocity Traverses for Stationary Sources

Firm RTP Associates
Location Old Bethpage Landfill Gas T/O
Diameters Upstream .5
Diameters Downstream 2.0

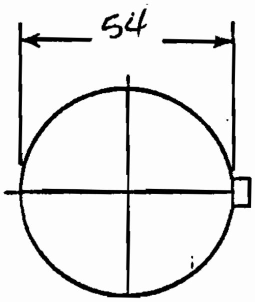
Total Traverse Points Required 16
Number of Ports 2
Points Per Port 8
Traverse ( Horizontal or Vertical) HORIZONTAL

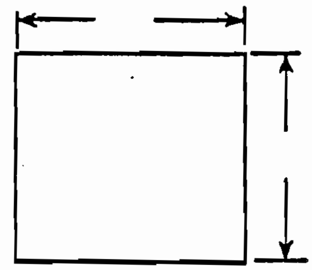
MINIMUM NUMBER OF TRAVERSE POINTS FOR PARTICULATE AND NONPARTICULATE TRAVERSES

Duct Diameters Upstream from Flow Disturbance (Distance A)

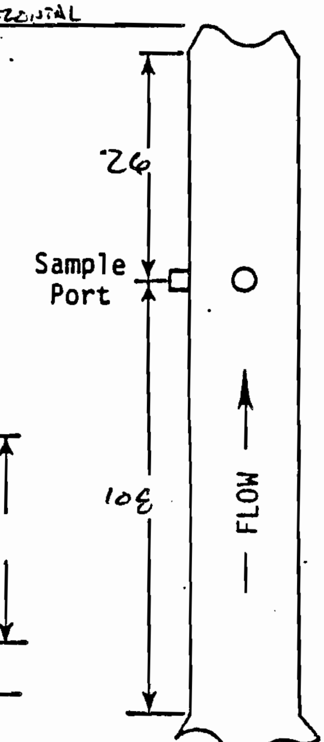



Duct Diameters Downstream from Flow Disturbance (Distance B)



$D_{eq} = \frac{2LW}{L+W} =$ ______




LOCATION OF TRAVERSE POINTS IN CIRCULAR STACKS

| Point Number On A Diameter | (Percent of stack diameter from inside wall to traverse point) Number Of Traverse Points On A Diameter 4 | 6 | 8 | 10 | 12 |
|---|---|---|---|---|---|
| 1 | 6.7 | 4.4 | 3.2 | 2.6 | 2.1 |
| 2 | 25.0 | 14.6 | 10.5 | 8.2 | 6.7 |
| 3 | 75.0 | 29.6 | 19.4 | 14.6 | 11.8 |
| 4 | 93.3 | 70.4 | 32.3 | 22.6 | 17.7 |
| 5 | | 85.4 | 67.7 | 34.2 | 25.0 |
| 6 | | 95.6 | 80.6 | 65.8 | 35.6 |
| 7 | | | 89.5 | 77.4 | 64.4 |
| 8 | | | 96.8 | 85.4 | 75.0 |
| 9 | | | | 91.8 | 82.3 |
| 10 | | | | 97.4 | 88.2 |
| 11 | | | | | 93.3 |
| 12 | | | | | 97.9 |

CROSS-SECTIONAL LAYOUT FOR RECTANGULAR STACKS

| Total Traverse Points | Matrix |
|---|---|
| 9 | 3x3 |
| 12 | 4x3 |
| 16 | 4x4 |
| 20 | 5x4 |
| 25 | 5x5 |

TRAVERSE POINT LOCATIONS

| No. | Distance From Wall | Nipple Size | Total Distance |
|---|---|---|---|
| 1 | 1.7 | | |
| 2 | 5.7 | | |
| 3 | 10.5 | | |
| 4 | 17.4 | | |
| 5 | 36.6 | | |
| 6 | 43.5 | | |
| 7 | 48.3 | | |
| 8 | 52.3 | | |
| 9 | | | |
| 10 | | | |
| 11 | | | |
| 12 | | | |

TRC Environmental Consultants, Inc.

TRC
EPA METHOD 2
VELOCITY TRAVERSE AND FLOWRATE DETERMINATION



PLANT Bethpage Landfill LFG Thermal Oxidizer
DATE 10 Nov 92
LOCATION LFG Thermal Oxidizer Oyster Bay NY
STACK DIMENSIONS 54" AREA ____ $ft^2$
BAROMETRIC PRESSURE, Pb = 29.87 in. Hg
STACK STATIC PRESSURE, Pg = ± ND in. $H_2O$
STACK GAS MOLECULAR WEIGHT (Wet), $M_w$ ____
STACK GAS MOISTURE CONTENT, % $H_2O$ = ____
PITOT NO. ____ Cp= .84
TESTER ____

SCHEMATIC OF TRAVERSE POINT LOCATION

Cyclonic Flow Angle + θ Clockwise - θ Counterclockwise

| PORT | POINT | ΔP Inch $H_2O$ | $\sqrt{\Delta P}$ | $T_s$ (°F) | ± θ | Pitots reversed for Negative Flow? | $\sqrt{\Delta P} \cdot \cos\theta$ |
|---|---|---|---|---|---|---|---|
| A | 1 | .01 | .1 | 1655 | | | |
| | 2 | .015 | | | | | |
| | 3 | .015 | | | | | |
| | 4 | 0.015 | | | | | |
| | 5 | 0.015 | | | | | |
| | 6 | 0.015 | | | | | |
| | 7 | 0.015 | | | | | |
| | 8 | 0.015 | | | | | |
| B | 1 | 0.012 | | | | | |
| | 2 | 0.013 | | | | | |
| | 3 | 0.015 | | | | | |
| | 4 | 0.015 | | | | | |
| | 5 | 0.017 | | | | | |
| | 6 | 0.017 | | | | | |
| | 7 | 0.017 | | | | | |
| | 8 | 0.020 | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | Average | .1224 | $T_s$ = 1655°F | * | | |
| | | | | $T_{sr}$ = 2115°R | | | |

*Avg. of absolute values including zeroes

Absolute Gas Temperature, $T_{sr} = T_s + 460°$
Absolute Gas Pressure, $P_s = P_b + P_g/13.6$ = ____
Gas Velocity, $V_s = (85.49)\ C_p\ (\sqrt{\Delta P} \cdot \cos\theta)\ \text{avg} \sqrt{\frac{T_{sr}\ \text{avg}}{P_s\ M_w}}$ = ____ ft/sec

Actual Gas Flowrate, $Q_a = (V_s)(60)(A)$ = ____ ACFM
Standard Gas Flowrate, $Q_{std} = Q_a \left(\frac{528°R}{T_{sr}}\right)\left(\frac{P_s}{29.92}\right)\left(\frac{100 - \%\ H_2O}{100}\right)$ = ____ DSCFM

TRC Environmental Consultants, Inc.

# EPA Method 4

## FIELD DATA SHEET

Firm Name RTP Inc
Plant Location Oyster Bay NY
Test Number 1
Sampling Location LFG Thermal Oxidizer
TRC Project No. 12034
Date 10 Nov 92
Tester D Prater

Orifice No. D-5
Ambient Temp. 80 °F
Bar. Press. 29.87 "Hg
Probe Ident. No. NA
Filter Ident. No. NA
Duct Area ______ ft²

Nozzle No. & Dia. NA in.
Assumed Moisture ______ %
Test Duration ______ min.
Traverse Point Interval NA min.
Probe Heater Setting NA °F
Filter Temp. Setting ______ °F
Dry Gas Meter Y ______

Nomograph C Factor NA
Pitot Coefficient NA
Orifice $\Delta H_A$ 1.0
Test Start Time 0930
Test Final Time 1030
Leak Test Start 0.001 CFM @ 12 "Hg
Leak Test Final 0.00 CFM @ 10 "Hg

| Port | Point | Time Min. (3-5) | Velocity ΔP in $H_2O$ (6-10) | ΔH in $H_2O$ (12-15) | $T_M$ in °F (18-20) | $T_M$ out °F (23-25) | $P_{Stack}$ in $H_2O$ (26-30) | $T_{Stack}$ °F (32-35) | Gas Sample Volume cu. ft. (40-45) | PROBE (50) | Cyc. Angle ø (52-53) | Heater Box Temp. | Temp. of Gas Leaving Condenser °F | Pump Vac. in Hg | Probe Temp. °F | $O_2$ % | Orsat Flow-rate (1pm) (SCFH) | F.O. Temp °F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | 00 | NA | 15 | 055 | 055 | NA | 1655 | 065288 | | | NA | NA | | NA | | | |
| | | 60 | | 10 | 059 | 059 | | | 048487 | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | |
| Average | | | $\Sigma\sqrt{\Delta P}$ | | | | | | | | | | | | | | | |

$H_2O$ Collected ______ 30 ml 250 - 200
SG Condition ______
SG Weight ______ gm
Total Volume Collect ______ ml

Orsat Bag Sample Triplicate Analysis, %

| $CO_2$ | $O_2$ | CO | $N_2$ |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

COMMENTS: ______

150

TRC Environmental Consultants, Inc.

TRC
EPA METHOD 2
VELOCITY TRAVERSE AND FLOWRATE DETERMINATION

PAGE ____ OF ____

PLANT OLD Bethpage Landfill Oyster Bay NY
DATE 10 Nov
LOCATION LFG Thermal Oxidizer
STACK DIMENSIONS 54" AREA ____ $ft^2$
BAROMETRIC PRESSURE, Pb = 29.57 in. Hg
STACK STATIC PRESSURE, Pg = ± ND in. $H_2O$
STACK GAS MOLECULAR WEIGHT (Wet), $M_w$ ____
STACK GAS MOISTURE CONTENT, % $H_2O$ = ____
PITOT NO. ____ Cp= .84
TESTER Dave Prater

SCHEMATIC OF TRAVERSE POINT LOCATION
Cyclonic Flow Angle: + θ Clockwise; - θ Counterclockwise

| PORT | POINT | ΔP Inch $H_2O$ | $\sqrt{\Delta P}$ | Ts (°F) | ± θ | Pitots reversed for Negative Flow? | $\sqrt{\Delta P}$ · COS θ |
|---|---|---|---|---|---|---|---|
| A | 1 | .0006 | | 1630 | NA | | |
| | 2 | .008 | | | | | |
| | 3 | .008 | | | | | |
| | 4 | .008 | | | | | |
| | 5 | .01 | | | | | |
| | 6 | .01 | | | | | |
| | 7 | .01 | | | | | |
| | 8 | .01 | | | | | |
| B | 1 | .003 | | | | | |
| | 2 | .003 | | | | | |
| | 3 | .005 | | | | | |
| | 4 | .005 | | | | | |
| | 5 | .005 | | | | | |
| | 6 | .005 | | | | | |
| | 7 | .007 | | | | | |
| | 8 | .007 | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | Average | | $T_s$ = °F | * | | |
| | | | | $T_{sr}$ = °R | | | |

*Avg. of absolute values including zeroes

Absolute Gas Temperature, $T_{sr} = T_s + 460^\circ$
Absolute Gas Pressure, $P_s = P_b + P_g/13.6$ = ____
Gas Velocity, $V_s = (85.49)\ C_p\ (\sqrt{\Delta P} \cdot \cos\theta)\ avg \sqrt{\frac{T_{sr}\ avg}{P_s\ M_w}}$ = ____ ft/sec

Actual Gas Flowrate, $Q_a = (V_s)(60)(A)$ = ____ ACFM
Standard Gas Flowrate, $Q_{std} = Q_a \left(\frac{528^\circ R}{T_{sr}}\right)\left(\frac{P_s}{29.92}\right)\left(\frac{100 - \%\ H_2O}{100}\right)$ = ____ DSCFM

Rev. 3 3/22/82

TRC Environmental Consultants, Inc.

# EPA Method 4

## FIELD DATA SHEET

Firm Name RTP INC
Plant Location OysterBay NY
Test Number 2
Sampling Location LFG Thermal Destruct
TRC Project No. 12034
Date 10 Nov 92
Tester D Prator

Orifice No. D-5
Ambient Temp. 50 °F
Bar. Press. 29.87 "Hg
Probe Ident. No. NA
Filter Ident. No. NA
Duct Area ______ ft²

Nozzle No. & Dia. NA in.
Assumed Moisture ______ %
Test Duration ______ min.
Traverse Point Interval NA min.
Probe Heater Setting NA °F
Filter Temp. Setting NA °F
Dry Gas Meter Y 1.00

Nomograph, C Factor NA
Pitot Coefficient NA
Orifice $\Delta H_{@}$ 1.87
Test Start Time 1320
Test Final Time 1420
Leak Test Start 0.01 CFM@ 10 "Hg
Leak Test Final 0.01 CFM@ 10 "Hg

| Port | Point | Time Min. (3-5) | Velocity $\Delta P$ in $H_2O$ (6-10) | $\Delta H$ in $H_2O$ (13-15) | $T_M$ in °F (18-20) | $T_M$ out °F (23-25) | $P_{Stack}$ in $H_2O$ (26-30) | $T_{Stack}$ °F (32-35) | Gas Sample Volume cu. ft. (40-45) | PROBE (50) | Cyc. Angle ø (52-53) | Heater Box Temp. | Temp. of Gas Leaving Condenser °F | Pump Vac. in Hg | Probe Temp. °F | $O_2$ % | Orsat Flow-rate (lpm) (SCFH) | F.O. Temp °F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1 | 00 | | 15 | 40 | 60 | | | 8904 | | | | | | | | | |
| | | 600 | | 15 | 62 | 61 | | | 12815 | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| Average | | | $\Sigma\sqrt{\Delta P}$ | | | | | | | | | | | | | | | |

$H_2O$ Collected 100 ml    300 - 200 = 100 ml
SG Condition ______
SG Weight ______ gm
Total Volume Collect ______ ml

Orsat Bag Sample Triplicate Analysis, %

| $CO_2$ | $O_2$ | CO | $N_2$ |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

COMMENTS: ______

Rev. 1    9/10/82

TRC Environmental Consultants, Inc.

TRC
EPA METHOD 2
VELOCITY TRAVERSE AND FLOWRATE DETERMINATION

PAGE ____ OF ____

PLANT OLD Bethpage Landfill Oyster Bay NY
DATE 10 Nov92
LOCATION LFG Thermal Oxidizer
STACK DIMENSIONS 54" AREA ______ $ft^2$
BAROMETRIC PRESSURE, Pb = 29.87 in. Hg
STACK STATIC PRESSURE, Pg = ± ______ in. $H_2O$
STACK GAS MOLECULAR WEIGHT (Wet), $M_w$ ______
STACK GAS MOISTURE CONTENT, % $H_2O$ = ______
PITOT NO. ______ Cp= .84
TESTER David Prater

SCHEMATIC OF TRAVERSE POINT LOCATION

Cyclonic Flow Angle + θ Clockwise - θ Counterclockwise

| PORT | POINT | ΔP Inch $H_2O$ | $\sqrt{\Delta P}$ | $T_s$ (°F) | ± θ | Pitots reversed for Negative Flow? | $\sqrt{\Delta P} \cdot \cos\theta$ |
|---|---|---|---|---|---|---|---|
| A | 1 | .004 | | 1645 | NA | NA | NA |
| | 2 | .005 | | | | | |
| | 3 | .007 | | | | | |
| | 4 | .01 | | | | | |
| | 5 | .01 | | | | | |
| | 6 | .007 | | | | | |
| | 7 | .01 | | | | | |
| | 8 | .01 | | | | | |
| B | 1 | .006 | | | | | |
| | 2 | .005 | | | | | |
| | 3 | .004 | | | | | |
| | 4 | .005 | | | | | |
| | 5 | .005 | | | | | |
| | 6 | .007 | | | | | |
| | 7 | .007 | | | | | |
| | 8 | .008 | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | Average | | $T_s$ = °F | * | | |
| | | | | $T_{sr}$ = °R | | | |

*Avg. of absolute values including zeroes

Absolute Gas Temperature, $T_{sr} = T_s + 460°$

Absolute Gas Pressure, $P_s = P_b + P_g/13.6$ = ______

Gas Velocity, $V_s = (85.49)\ C_p\ (\sqrt{\Delta P} \cdot \cos\theta)\ avg \sqrt{\frac{T_{sr}\ avg}{P_s\ M_w}}$ = ______ ft/sec

Actual Gas Flowrate, $Q_a = (V_s)(60)(A)$ = ______ ACFM

Standard Gas Flowrate, $Q_{std} = Q_a \left(\frac{528°R}{T_{sr}}\right)\left(\frac{P_s}{29.92}\right)\left(\frac{100 - \%\ H_2O}{100}\right)$ = ______ DSCFM

TRC Environmental Consultants, Inc.

EPA Method 4

**FIELD DATA SHEET**

Firm Name RTP, Inc
Plant Location Oyster Bay NY
Test Number B
Sampling Location LFG Thermal Oxidizer
TRC Project No. 12034
Date 10 Nov 92
Tester D. Prater

Orifice No. D-5
Ambient Temp. 50 °F
Bar. Press. 29.87 "Hg
Probe Ident. No. NA
Filter Ident. No. NA
Duct Area ______ ft²

Nozzle No. & Dia. NA in.
Assumed Moisture ______ %
Test Duration ______ min.
Traverse Point Interval NA min.
Probe Heater Setting NA °F
Filter Temp. Setting NA °F
Dry Gas Meter Y 1.00

Nomograph C Factor NA
Pitot Coefficient NA
Orifice $\Delta H_A$ 1.77
Test Start Time 1655
Test Final Time 1755
Leak Test Start 0.01 CFM@ 8 "Hg
Leak Test Final 0.01 CFM@ 8 "Hg

| Port | Point | Time Min. | Velocity $\Delta P$ in $H_2O$ | $\Delta H$ in $H_2O$ | $T_M$ in °F | $T_M$ out °F | $P_{Stack}$ in $H_2O$ | $T_{Stack}$ °F | Gas Sample Volume cu. ft. | PROBE | Cyc. Angle ø | Heater Box Temp. | Temp. of Gas Leaving Condenser °F | Pump Vac. in Hg | Probe Temp. °F | $O_2$ % | Orsat Flow-rate (lpm) (SCFH) | F.O. Temp °F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | :00 | | 1.5 | 55 | 55 | | | 128.47 | | | | | | | | | |
| | | 60 | | 1.5 | 56 | 56 | | | 167.99 | | | | | | | | | |
| Average | | | $\Sigma\sqrt{\Delta P}$ | | | | | | | | | | | | | | | |

$H_2O$ Collected 97 ml
SG Condition
SG Weight ______ gm
Total Volume Collect ______ ml

297 - 200 = 97 ml

Orsat Bag Sample Triplicate Analysis, %

| $CO_2$ | $O_2$ | CO | $N_2$ |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

COMMENTS:

Rev. 1 9/10/82

# VOST SAMPLING FIELD DATA

Plant Name Old Beth Page Land Fill/RTP City ______
Sample Location Methane Pallet Outlet Date 11-10-92
Barometric Pressure 29.82 in. Hg Run No. O-1
Ambient Temperature 45 F Operator R Potter

Trap Nos. ______ From Can No. ______ Meter Console No. 0106
Flow Direction Marked?
DGM Y-Factor 1.00

Pretest Leak Check: 0.00 in. Hg/min @ 25 in. Hg vacuum
Probe Purged: ______ minutes @ ______ Lpm

| SAMPLING TIME min | CLOCK TIME 24 hr | METER VOLUME READING L (ft3) | ROTAMETER FLOW RATE SETTING Lpm (cfm) | % DEV* | PROBE TEMP C (F) | TENAX GAS TEMP C (F) | DRY GAS METER TEMP C (F) | VACUUM in Hg |
|---|---|---|---|---|---|---|---|---|
| 0 | 0930 | 7352.78 | .5 | | 271 | 55 | | 2.0 |
| 10 | | 7357.77 | .5 | | 270 | 56 | 70 | 2.0 |
| ~~20~~ 15 20 | | 7360.30 7362.82 | .5 .5 | | 270 | 56 | 71 72 | 2.0 2.0 |
| ~~30~~ 33 38 | | 7365.38 7367.80 | .5 .5 | | 270 | 56 | 73 74 | 2.0 2.0 |
| ~~40~~ 38 40 | 1010 | 7370.30 | .5 | | 270 | 55 | 75 | 2.0 |
| | | 7372.85 | | | 7 | | | |
| Total 40 | | Total Vm | Average – | | Avg 270 | Avg | Avg | Max |

* % DEV = (Q – Qavg)/Qavg X 100 (Must be <10%)

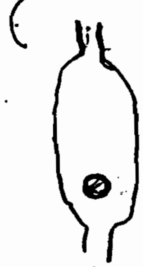
Vstd = (Vm, L) x Y x 17.647 x [(Pb, in. Hg)/(Tm, deg R)] = __ __ . __ __ __

## SAMPLE RECOVERY

Post-test Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Leak Check: <0.01 in. Hg/min @ 10 in. Hg vacuum
Liquid Condensate Recovered? ______ VOA Label Nos. ______
Total Condensate Volume in VOAs ______ Remaining Condensate ______ mL
Traps Stored in Can Number: ______ On Ice? ______ N2 Purge? ______
Corresponding Blank Nos.
Comments: front trap flow is toward frosted dot
→ will cont. for all 12 tests

orifice pressure
0.4 inches W.C.

| | Lot |
|---|---|
| front trap | 885 D |
| back trap | 881 D |


flow ↓

# VOST SAMPLING FIELD DATA

Plant Name Old Beth Page Land Fill / RTP
City
Sample Location Methane Plant Outlet
Date 11-10-92
Barometric Pressure 29.82 in. Hg
Run No. 0-2
Ambient Temperature 45 F
Operator R Potter

Trap Nos.
From Can No.
Meter Console No. 0106
Flow Direction Marked?
DGM Y-Factor 1.00

Pretest Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Purged: minutes @ Lpm

| SAMPLING TIME min | CLOCK TIME 24 hr | METER VOLUME READING L (ft3) | ROTAMETER FLOW RATE SETTING Lpm (cfm) | % DEV* | PROBE TEMP C (F) | TENAX GAS TEMP C (F) | DRY GAS METER TEMP C (F) | VACUUM in Hg |
|---|---|---|---|---|---|---|---|---|
| 0 | 1024 | 7373.21 | .5 | | 275 ~~274~~ | 52 | ~~78~~ 77 | 2.0 |
| 5 | | 7376.3 | .5 | | 277 ~~276~~ | 52 | ~~78~~ 78 | 2.0 |
| 10 | | 7378.8 | .5 | | 277 ~~274~~ | 53 | 79 | 2.0 |
| 15 | | 7381.3 | .5 | | 277 | 53 | 80 | 2.0 |
| 20 | | 7383.8 | .5 | | 273 | 54 | 81 | 2.0 |
| 25 | | 7386.2 | .5 | | 275 | 54 | 81 | 2.0 |
| Total 30 | | Total Vm | Average .5 | | Avg | Avg | Avg 83 | Max 2.0 |
| 35 | | 7391.37 | .5 | | | | 84 | 2.0 |
| 40 | 1104 | 7393.60 | - | | | | | |

* % DEV = (Q – Qavg)/Qavg X 100 (Must be <10%)

Vstd = (Vm, L) x Y x 17.647 x [(Pb, in. Hg)/(Tm, deg R)] = ___.___

## SAMPLE RECOVERY

Post-test Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Leak Check: in. Hg/min @ in. Hg vacuum
Liquid Condensate Recovered? VOA Label Nos.
Total Condensate Volume in VOAs Remaining Condensate mL
Traps Stored in Can Number: On Ice? N2 Purge?
Corresponding Blank Nos.
Comments:

orifice pressure 0.4 inches WC

| | Lot # |
|---|---|
| Front | 885D |
| Back | 881D |

# VOST SAMPLING FIELD DATA

Plant Name Old Beth Page Landfill / RTP
Sample Location Methane Plant Outlet
Barometric Pressure 29.82 in. Hg
Ambient Temperature 50 F

City
Date 11-10-92
Run No. O-3
Operator R. Potter

Trap Nos. ______ From Can No. ______
Flow Direction Marked?

Meter Console No. 0106
DGM Y-Factor 1.00

Pretest Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Purged: ______ minutes @ ______ Lpm

| SAMPLING TIME min | CLOCK TIME 24 hr | METER VOLUME READING L (ft3) | ROTAMETER FLOW RATE SETTING Lpm (cfm) | % DEV* | PROBE TEMP C (F) | TENAX GAS TEMP C (F) | DRY GAS METER TEMP C (F) | VACUUM in Hg |
|---|---|---|---|---|---|---|---|---|
| 0 | 1117 | 7393.80 | .5 | | 269 | 54 | 85 | 2.0 |
| 5 | | 7396.3 | .5 | | 268 | 55 | 86 | 2.0 |
| 10 | | 7399.7 | .5 | | 271 | 55 | 87 | 2.0 |
| 15 | | 7401.5 | .5 | | 272 | 55 | 87 | 2.0 |
| 20 | | 7403.9 | .5 | | 273 | 56 | 87 | 2.0 |
| 25 | | 7406.3 | .5 | | 274 | 56 | 88 | 2.0 |
| Total 30 | | Total Vm | Average .5 | | Avg 271 | Avg | Avg 89 | Max 2.0 |
| 35 | | 7411.1 | .5 | | 273 | | 81 | 2.0 |
| 40 | 1157 | 7413.62 | - | | | | | |

* % DEV = (Q – Qavg)/Qavg X 100 (Must be <10%)

Vstd = (Vm, L) x Y x 17.647 x [(Pb, in. Hg)/(Tm, deg R)] = ___.____

## SAMPLE RECOVERY

Post-test Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Leak Check: ______ in. Hg/min @ ______ in. Hg vacuum
Liquid Condensate Recovered? ______ VOA Label Nos. ______
Total Condensate Volume in VOAs ______ Remaining Condensate ______ mL
Traps Stored in Can Number: ______ On Ice? ______ N2 Purge? ______
Corresponding Blank Nos. ______
Comments: ______

orifice pressure 0.4 inches WC

Lot #
Front 885D
Back 881D

# VOST SAMPLING FIELD DATA

Plant Name Old Beth Page Landfill/RTP
City
Sample Location Methane Plant Outlet
Date 11-10-92
Barometric Pressure 29.87 in. Hg
Run No. 0-4
Ambient Temperature 50 F
Operator R Potter

Trap Nos. ______ From Can No. ______ Meter Console No. 0106
Flow Direction Marked?
DGM Y-Factor 1.00

Pretest Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Purged: ______ minutes @ ______ Lpm

| SAMPLING TIME min | CLOCK TIME 24 hr | METER VOLUME READING L (ft3) | ROTAMETER FLOW RATE SETTING Lpm (cfm) | % DEV* | PROBE TEMP C (F) | TENAX GAS TEMP C (F) | DRY GAS METER TEMP C (F) | VACUUM in Hg |
|---|---|---|---|---|---|---|---|---|
| 0 | 1207 | 7413.86 | .5 | | 271 | 58 | 90 | 2.0 |
| 5 | | 741 | | | 269 | 58 | 90 | 2.0 |
| 10 | | 7418.8 | 4 | | 272 | 58 | 89 | 2.0 |
| 15 | | 7421.3 | 8 | | 273 | 57 | 89 | 2.0 |
| 20 | | 7423.7 | [illegible] | | 271 | 57 | 90 | 2.0 |
| 25 | | 7426.3 | 4 | | 270 | 58 | 91 | 2.0 |
| Total 30 | | Total Vm 7431.2 | Average | | Avg 272 | Avg 60 | Avg 92 | Max 2.0 |
| 35 | | | | | 273 | 60 | 92 | 2.0 |
| 40 | 1247 | 7433.65 | - | | | | | |

* % DEV = (Q – Qavg)/Qavg X 100 (Must be <10%)

Vstd = (Vm, L) x Y x 17.647 x [(Pb, in. Hg)/(Tm, deg R)] = ___.____

## SAMPLE RECOVERY

Post-test Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Liquid Condensate Recovered? ______ VOA Label Nos. ______
Total Condensate Volume in VOAs ______ Remaining Condensate ______ mL
Traps Stored in Can Number: ______ On Ice? ______ N2 Purge? ______
Corresponding Blank Nos. ______
Comments: ______

Lot # orifice pressure 0.3 inches WC

Front 885D

Back 881D

# VOST SAMPLING FIELD DATA

Plant Name Old Beth Page / RJP  City ______
Sample Location Methane Plant Outlet  Date 11-10-92
Barometric Pressure 29.82 in. Hg  Run No. 0-5
Ambient Temperature ______ F  Operator R Potter

Trap Nos. ______ From Can No. ______ Meter Console No. 0106
Flow Direction Marked?

DGM Y-Factor 1.00

Pretest Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Purged: ______ minutes @ ______ Lpm

| SAMPLING TIME min | CLOCK TIME 24 hr | METER VOLUME READING L (ft3) | ROTAMETER FLOW RATE SETTING Lpm (cfm) | % DEV* | PROBE TEMP C (F) | TENAX GAS TEMP C (F) | DRY GAS METER TEMP C (F) | VACUUM in Hg |
|---|---|---|---|---|---|---|---|---|
| 0 | ~~1315~~ 1330 | 7434.92 | .5 | | 264 | 62 | 79 | 2.0 |
| 5 | | 7437.4 | .5 | | 267 | 61 | 79 | 2.0 |
| 10 | | 7439.8 | 4 .5 | | 271 | 62 | 81 | 2.0 |
| 15 | | 7442.3 | 4 .5 | | 270 | 63 | 82 | 2.0 |
| 20 | | 7444.6 | 4 .5 | | 271 | 64 | 82 | 2.0 |
| 25 | | 7447.0 | 4 .5 | | 273 | 65 | 83 | 2.0 |
| Total 30 | | Total Vm 7452.8 | Average .5 | | Avg 271 | Avg 66 | Avg 84 | Max 2.0 |
| 35 | | | .5 | | 272 | 65 | 84 | 2.0 |
| 40 | ~~1355~~ 1410 | 7454.13 | - | | | | | |

* % DEV = (Q – Qavg)/Qavg X 100 (Must be <10%)

Vstd = (Vm, L) x Y x 17.647 x [(Pb, in. Hg)/(Tm, deg R)] = ___.___

## SAMPLE RECOVERY

Post-test Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Leak Check: ______ in. Hg/min @ ______ in. Hg vacuum
Liquid Condensate Recovered? ______ VOA Label Nos. ______
Total Condensate Volume in VOAs ______ Remaining Condensate ______ mL
Traps Stored in Can Number: ______ On Ice? ______ N2 Purge? ______
Corresponding Blank Nos. ______
Comments: ______

0.4 orifice pressure inches WC

Lot #

Front 885 D

Back 881 D

# VOST SAMPLING FIELD DATA

Plant Name Old Beth Page Landfill/RTP
Sample Location Method Plant Outlet
Barometric Pressure 29.87 in. Hg
Ambient Temperature 50 F

City ________
Date 11-10-92
Run No. O-6
Operator R Potter

Trap Nos. ________ From Can No. ________
Flow Direction Marked?

Meter Console No. 0106
DGM Y-Factor 1.00

Pretest Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Purged: ________ minutes @ ________ Lpm

| SAMPLING TIME min | CLOCK TIME 24 hr | METER VOLUME READING (L) (ft3) | ROTAMETER FLOW RATE SETTING (Lpm) (cfm) | % DEV* | PROBE TEMP C (F) | TENAX GAS TEMP C (F) | DRY GAS METER TEMP C (F) | VACUUM in Hg |
|---|---|---|---|---|---|---|---|---|
| 0 | 1410 | 7454.50 | .5 | | 269 | 61 | 78 | 2.0 |
| 5 | | 7457.00 | .5 | | 271 | 63 | 78 | 2.0 |
| 10 | | 7459.4 | .5 | | 272 | 64 | 79 | 2.0 |
| 15 | | 7461.7 | .5 | | 272 | 65 | 79 | 2.0 |
| 20 | | 7464.1 | .5 | | 271 | 62 | 79 | 2.0 |
| 25 | | 7466.5 | .5 | | 268 | 59 | 79 | 2.0 |
| Total 30 | | Total Vm | Average .5 | | Avg 269 | Avg 59 | Avg 79 | Max 2.0 |
| 35 | | 7471.6 | | | 270 | 58 | 79 | 2.0 |
| 40 | 1450 | 7474.00 | - | | | | | |

* % DEV = (Q – Qavg)/Qavg X 100 (Must be <10%)

Vstd = (Vm, L) x Y x 17.647 x [(Pb, in. Hg)/(Tm, deg R)] = ___.____

## SAMPLE RECOVERY

Post-test Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Leak Check: ________ in. Hg/min @ ________ in. Hg vacuum
Liquid Condensate Recovered? ________ VOA Label Nos. ________
Total Condensate Volume in VOAs ________ Remaining Condensate ________ mL
Traps Stored in Can Number: ________ On Ice? ________ N2 Purge? ________
Corresponding Blank Nos. ________
Comments: ________

Lot #

orifice pressure 0.4 inches WC

Front 880D
Back 880D

# VOST SAMPLING FIELD DATA

Plant Name Old Bethpage Land Fill / RTP
Sample Location Methane Plant Outlet
Barometric Pressure 29.87 in. Hg
Ambient Temperature 45 F

City
Date 11-10-03
Run No. 0-7
Operator R Potter

Trap Nos. ______ From Can No. ______
Flow Direction Marked?

Meter Console No. 0106
DGM Y-Factor 1.00

Pretest Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Purged: ______ minutes @ ______ Lpm

| SAMPLING TIME min | CLOCK TIME 24 hr | METER VOLUME READING L (ft3) | ROTAMETER FLOW RATE SETTING Lpm (cfm) | % DEV* | PROBE TEMP C (F) | TENAX GAS TEMP C (F) | DRY GAS METER TEMP C (F) | VACUUM in Hg |
|---|---|---|---|---|---|---|---|---|
| 0 | 1500 | 7474.25 | .5 | | 266 | 56 | 79 | 2.0 |
| 5 | | 7476.8 | .5 | | 269 | 55 | 79 | 2.0 |
| 10 | | 7479.6 | ~~2~~.5 | | 271 | 56 | 77 | 2.0 |
| 15 | | 7482.0 | ~~2~~.5 | | 272 | 56 | 75 | 2.0 |
| 20 | | 7484.5 | .5 | | 272 | 57 | 75 | 2.0 |
| 25 | | — | — | | — | — | — | — |
| Total ~~30~~ 35 40 | 1540 | ~~Total Vm~~ 7491.7 7494.13 | Average ~~.5~~ .5 - | | Avg ~~272~~ 272 | Avg ~~57~~ 58 | Avg ~~75~~ 74 | Max ~~2.0~~ 2.0 |

* % DEV = (Q – Qavg)/Qavg X 100 (Must be <10%)

Vstd = (Vm, L) x Y x 17.647 x [(Pb, in. Hg)/(Tm, deg R)] = ___.____

## SAMPLE RECOVERY

Post-test Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Leak Check: ______ in. Hg/min @ ______ in. Hg vacuum
Liquid Condensate Recovered? ______ VOA Label Nos. ______
Total Condensate Volume in VOAs ______ Remaining Condensate ______ mL
Traps Stored in Can Number: ______ On Ice? ______ N2 Purge? ______
Corresponding Blank Nos. ______
Comments: ______

orifice pressure 0.4 inches WC

Lot #

Front 885D

Back 881D

# VOST SAMPLING FIELD DATA

Plant Name Old BethPage LandFill / RTD
Sample Location Methane Plant Outlet
Barometric Pressure $\boxed{29.82}$ in. Hg
Ambient Temperature 45 F

City ______
Date 11-10-92
Run No. O-8
Operator R Potter

Trap Nos. ______ From Can No. ______ Meter Console No. 0106
Flow Direction Marked?

DGM Y-Factor $\boxed{1.00}$

Pretest Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Purged: ______ minutes @ ______ Lpm

| SAMPLING TIME min | CLOCK TIME 24 hr | METER VOLUME READING L (ft3) | ROTAMETER FLOW RATE SETTING Lpm (cfm) | % DEV* | PROBE TEMP C F | TENAX GAS TEMP C F | DRY GAS METER TEMP C F | VACUUM in Hg |
|---|---|---|---|---|---|---|---|---|
| 0 | 1550 | 7494.28 | .5 | | 268 | 55 | 72 | 2.0 |
| 5 | | 7496.7 | .5 | | 272 | 53 | 71 | 2.0 |
| 10 | | 7499.1 | .5 | | 273 | 50 | 70 | 2.0 |
| 15 | | 7502.7 | .5 | | 272 | 46 | 70 | 2.0 |
| 20 | | 7504.2 | .5 | | 273 | 46 | 70 | 2.0 |
| 25 | | 7506.8 | .5 | | 272 | 45 | 69 | 2.0 |
| Total 30 | | Total Vm | Average .5 | | Avg 271 | Avg 45 | Avg 69 | Max 2.0 |
| 35 | | 7512.8 | .5 | | 273 | 45 | 70 | 2.0 |
| 40 | 1630 | 7514.20 | - | | | | | |

* % DEV = (Q – Qavg)/Qavg X 100 (Must be <10%)

Vstd = (Vm, L) x Y x 17.647 x [(Pb, in. Hg)/(Tm, deg R)] = ___ . ___

## SAMPLE RECOVERY

Post-test Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Liquid Condensate Recovered? ______ VOA Label Nos. ______
Total Condensate Volume in VOAs ______ Remaining Condensate ______ mL
Traps Stored in Can Number: ______ On Ice? ______ N2 Purge? ______
Corresponding Blank Nos. ______
Comments: ______

Lot #

Orifice pressure 0.35 inches WC

Front 885D

Back 881D

# VOST SAMPLING FIELD DATA

Plant Name BethPage Landfill / BTP  City ____
Sample Location Methane Plant Outlet  Date 11-10-92
Barometric Pressure $\boxed{29.87}$ in. Hg  Run No. O-9
Ambient Temperature 45 F  Operator R Potter

Trap Nos. ____ From Can No. ____  Meter Console No. 0106
Flow Direction Marked?

DGM Y-Factor $\boxed{1.00}$

Pretest Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Probe Purged: ____ minutes @ ____ Lpm

| SAMPLING TIME min | CLOCK TIME 24 hr | METER VOLUME READING L (ft3) | ROTAMETER FLOW RATE SETTING Lpm (cfm) | % DEV* | PROBE TEMP C F | TENAX GAS TEMP C F | DRY GAS METER TEMP C F | VACUUM in Hg |
|---|---|---|---|---|---|---|---|---|
| 0 | 1652 | 7514.40 | .5 | | 263 | 47 | 67 | 2.0 |
| 5 | | | .5 | | | | | |
| 10 | | 7519.6 | .5 | | 269 | 45 | 66 | 2.0 |
| 15 | | | .5 | | | | | |
| 20 | | 7524.1 | .5 | | 272 | 50 | 67 | 20 |
| 25 | | 7526.8 | .5 | | 272 | 51 | 67 | 2.0 |
| Total 30 35 40 | 1732 | Total Vm 7532.8 7534.09 | Average .5 .5 | | Avg 271 271 | Avg 50 50 | Avg 67 66 | Max 2.0 2.0 |

* % DEV = (Q – Qavg)/Qavg X 100 (Must be <10%)

Vstd = (Vm, L) x Y x 17.647 x [(Pb, in. Hg)/(Tm, deg R)] = __ __ . __ __ __

## SAMPLE RECOVERY

Post-test Leak Check: 0.00 in. Hg/min @ 8 in. Hg vacuum
Probe Leak Check: ____ in. Hg/min @ ____ in. Hg vacuum
Liquid Condensate Recovered? ____ VOA Label Nos. ____
Total Condensate Volume in VOAs ____ Remaining Condensate ____ mL
Traps Stored in Can Number: ____ On Ice? ____ N2 Purge? ____
Corresponding Blank Nos. ____
Comments: ____

Lot #

Orifice pressure 0.35 inches W/C

Front 885D

Back 881D

# VOST SAMPLING FIELD DATA

Plant Name OldBethPageLandfill /RTP
City
Sample Location Methane Plant outlet
Date 11-10-92
Barometric Pressure 29.82 in. Hg
Run No. C-10
Ambient Temperature 45 F
Operator R Potter

Trap Nos.
From Can No.
Meter Console No. 0106
Flow Direction Marked?

DGM Y-Factor 1.00

Pretest Leak Check: 0.00 in. Hg/min @ 9 in. Hg vacuum
Probe Purged: minutes @ Lpm

| SAMPLING TIME min | CLOCK TIME 24 hr | METER VOLUME READING (L)(ft3) | ROTAMETER FLOW RATE SETTING (Lpm) (cfm) | % DEV* | PROBE TEMP (C)(F) | TENAX GAS TEMP (C)(F) | DRY GAS METER TEMP (C)(F) | VACUUM in Hg |
|---|---|---|---|---|---|---|---|---|
| 0 | 1740 | 7534.50 | .5 | | 272 | 51 | 71 | 2.0 |
| 5 | | ~~7536~~ 7536.1 | | | 273 | 50 | 72 | 2.0 |
| 10 | | 7539.2 | | | 272 | 50 | 72 | 2.0 |
| 15 | | | | | | | | |
| 20 | | | 7542.7 | | | | | |
| 25 | | 7546.2 | | | 272 | 49 | 73 | 2.0 |
| Total 30 | | ~~Total Vm~~ 7550.2 | Average | | Avg 272 | Avg 49 | Avg 73 | Max 2.0 |
| 35 | | | | | 269 | 49 | 72 | 2.0 |
| 40 | 1820 | 7554.47 | - | | | | | |

* % DEV = (Q – Qavg)/Qavg X 100 (Must be <10%)

Vstd = (Vm, L) x Y x 17.647 x [(Pb, in. Hg)/(Tm, deg R)] = ___.____

## SAMPLE RECOVERY

Post-test Leak Check: 0.00 in. Hg/min @ 7 in. Hg vacuum
Probe Leak Check: in. Hg/min @ in. Hg vacuum
Liquid Condensate Recovered? VOA Label Nos.
Total Condensate Volume in VOAs Remaining Condensate mL
Traps Stored in Can Number: On Ice? N2 Purge?
Corresponding Blank Nos.
Comments:

Lot # orifice pressure 0.4 inches WC

Front 885D

Back 881D

# VOST SAMPLING FIELD DATA

Plant Name Ch.Bath Bor landfill / RTP
City
Sample Location Methane Plant @ 7th
Date @ 11-10-92
Barometric Pressure 29.87 in. Hg
Run No. 0-11
Ambient Temperature 40 F
Operator R Potter

Trap Nos. ______ From Can No. ______ Meter Console No. 0106
Flow Direction Marked?

DGM Y-Factor 1.00

Pretest Leak Check: 0.00 in. Hg/min @ 8 in. Hg vacuum
Probe Purged: ______ minutes @ ______ Lpm

| SAMPLING TIME min | CLOCK TIME 24 hr | METER VOLUME READING L (ft3) | ROTAMETER FLOW RATE SETTING Lpm (cfm) | % DEV* | PROBE TEMP C (F) | TENAX GAS TEMP C (F) | DRY GAS METER TEMP C (F) | VACUUM in Hg |
|---|---|---|---|---|---|---|---|---|
| 0 | 1830 | 7554.75 | .5 | | 273 | 48 | 74 | 2.0 |
| 5 | | 7557.1 | | | 274 | 48 | 74 | 2.0 |
| 10 | | 7559.5 | | | 273 | 48 | 74 | 2.0 |
| 15 | | 7562.9 | 7568.9 | | 271 | 48 | 74 | 2.0 |
| 20 | | 7564.1 | | | 272 | 48 | 74 | 2.0 |
| 25 | | 7566.5 | | | 271 | 48 | 74 | 2.0 |
| Total 30 | | Total Vm | Average | | Avg 272 | Avg 47 | Avg 74 | Max 2.0 |
| 35 | | 7571.4 | | | 270 | 47 | 74 | 2.0 |
| 40 | 1910 | 7574.14 | - | | | | | |

* % DEV = (Q – Qavg)/Qavg X 100 (Must be <10%)

Vstd = (Vm, L) x Y x 17.647 x [(Pb, in. Hg)/(Tm, deg R)] = ___.____

## SAMPLE RECOVERY

Post-test Leak Check: 0.00 in. Hg/min @ 8 in. Hg vacuum
Probe Leak Check: ______ in. Hg/min @ ______ in. Hg vacuum
Liquid Condensate Recovered? ______ VOA Label Nos. ______
Total Condensate Volume in VOAs ______ Remaining Condensate ______ mL
Traps Stored in Can Number: ______ On Ice? ______ N2 Purge? ______
Corresponding Blank Nos. ______
Comments: ______

orifice pressure ~~0.30~~ 0.35 inches wc RDP

Lot #

Front 885 D

Back 881 D

# VOST SAMPLING FIELD DATA

Plant Name: N Beth Pacel Landfill / RTP
Sample Location: Methane Plant Outlet
Barometric Pressure: 29.87 in. Hg
Ambient Temperature: 40 F

City: ________
Date: 11-10-92
Run No.: 0-12
Operator: R Potter

Trap Nos. ________ From Can No. ________
Meter Console No. 0106
Flow Direction Marked?
DGM Y-Factor: 1.00

Pretest Leak Check: 0.00 in. Hg/min @ 7 in. Hg vacuum
Probe Purged: ________ minutes @ ________ Lpm

RDP

| SAMPLING TIME min | CLOCK TIME 24 hr | METER VOLUME READING L (ft3) | ROTAMETER FLOW RATE SETTING Lpm (cfm) | % DEV* | PROBE TEMP C F | TENAX GAS TEMP C F | DRY GAS METER TEMP C F | VACUUM in Hg |
|---|---|---|---|---|---|---|---|---|
| 0 | 1920 | 7574.40 | .5 | | 272 | 73 | 50 | 2.0 |
| 5 | | 7576.9 | | | 272 | 72 | 50 | 2.0 |
| 10 | | 7579.5 | | | 271 | 72 | 49 | 2.0 |
| 15 | | 7582.1 | 7589.4 | | 270 | 72 | 51 | 2.0 |
| 20 | | 7584.7 | | | 269 | 72 | 52 | 2.0 |
| 25 | 18 | 7587.0 | | | 271 | 72 | 53 | 2.0 |
| Total 30 35 40 | | Total Vm 7591.4 | Average | | Avg 272 272 | Avg 72 72 | Avg 54 54 | Max 2.0 2.0 |
| | 18 2000 | 7593.63 | - | | | | | |

* % DEV = (Q – Qavg)/Qavg X 100 (Must be <10%)

Vstd = (Vm, L) x Y x 17.647 x [(Pb, in. Hg)/(Tm, deg R)] = ___.____

## SAMPLE RECOVERY

Post-test Leak Check: 0.00 in. Hg/min @ 6 in. Hg vacuum
Probe Leak Check: 0.00 in. Hg/min @ 10 in. Hg vacuum
Liquid Condensate Recovered? ________ VOA Label Nos. ________
Total Condensate Volume in VOAs ________ Remaining Condensate ________ mL
Traps Stored in Can Number: ________ On Ice? ________ N2 Purge? ________
Corresponding Blank Nos. ________
Comments: ________

Lot # orifice pressure 0.4 inches WC

Front 885D

Back 881D

TRC Environmental Consultants
CEM Data Sheet

| | |
|---|---|
| Firm OLD BETHPAGE LANDFILL | Ambient Temp. deg. F = [illegible] |
| Location LI N.Y. | MID Temp deg. F = 74.7 |
| Tester SBN | Bar. Pressure In Hg = [illegible] |
| Test No. T-1 | Vacuum Gauge = [illegible] |
| Sample Loc. OUTLET | Pressure Gauge = |
| Date 11/10/92 | |
| TIME 0900-1130 | |

Initial Values Final Values

| | | Back Analyzer Cal Response | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | Zero | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | | | |
| | Upscale | [illegible] | [illegible] | [illegible] | [illegible] | -2.[illegible] | [illegible] | | | |
| [illegible] | Zero | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | - | - |
| | Upscale | [illegible] | [illegible] | -1 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| CO2 | Zero | 0.1 | 0.1 | 0 | 0.2 | [illegible] | 1.4 | PERCENT | - | - |
| | Upscale | 12.3 | 12.3 | -0.4 | 22.[illegible] | -[illegible].4 | [illegible] | 5 | [illegible] | [illegible] |
| [illegible] | Zero | 0 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | ppm | - | |
| | Upscale | [illegible]3.9 | [illegible]1.7 | -[illegible].2 | 9[illegible] | -[illegible].9 | -1.7 | [illegible] | [illegible] | [illegible] |
| SO2 | Zero | -1.[illegible] | [illegible] | -0.05 | -[illegible].2 | -[illegible].48 | -[illegible].4 | ppm | - | - |
| | Upscale | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | Zero | [illegible] | [illegible] | [illegible]2 | -0.[illegible] | -1 | [illegible] | [illegible] | | |
| | Upscale | 91.7 | 91.3 | [illegible].6 | [illegible]0.5 | -0.2 | [illegible] | [illegible] | - | |
| | | LIMIT | -- [illegible] | | -- [illegible] | -- [illegible] | | | | |

Calibration Gas

| | | Cal. Analyzer Response | Cal. Back/Upstream Analyzer Response | Bias Check (% of Span) |
|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| | Upscale | 96.3 | 96.5 | 0.2 |
| NOx | Zero | 0.1 | 0 | -0.1 |
| | Upscale | 94 | 93.9 | -0.1 |
| | | LIMIT | -- [illegible] | |

| | Conc Mid Cal | Conc High Cal | Tank ID Mid | Tank ID High |
|---|---|---|---|---|
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| O2 | [illegible].02 | 22 | [illegible] | [illegible] |
| CO2 | [illegible] | [illegible] | [illegible] | [illegible] |
| NOx | 42.4 | 9[illegible].2 | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | 9.15 | 9[illegible] | [illegible] | [illegible] |

[illegible] Environmental Consultants
[illegible] Data Sheet

| | |
|---|---|
| Firm OLD BETHPAGE LANDFILL | Ambient Temp. deg. F = [illegible] |
| Location LI N.Y. | MEL Temp. deg. F = [illegible] |
| Tester SBK | Bar. Pressure, in Hg = [illegible] |
| Test No. [illegible]-2 | Vacuum Gauge = [illegible] |
| Sample Loc. OUTLET | Pressure Gauge = |
| Date 11/10/92 | |
| TIME 1320-1620 | |

Initial Values [illegible] Final Values

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| [illegible] | Zero | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | - | - |
| | Upscale | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | Zero | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | - | - |
| | Upscale | [illegible] | [illegible] | [illegible] | [illegible] | -1.6 | [illegible] | [illegible] | [illegible] | [illegible] |
| CO2 | Zero | [illegible] | [illegible] | 0.4 | 0.3 | [illegible] | [illegible] | PERCENT | - | - |
| | Upscale | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| NOx | Zero | 0 | 0.2 | 0.2 | [illegible] | [illegible] | [illegible] | ppm | - | - |
| | Upscale | 93.9 | 90 | -3.9 | 92.2 | -1.7 | 2.2 | 100 | [illegible] | [illegible] |
| SO2 | Zero | -1 | [illegible] | [illegible] | [illegible] | 0.66 | 0.28 | ppm | - | |
| | Upscale | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | Zero | [illegible] | [illegible] | [illegible] | - | [illegible] | [illegible] | [illegible] | - | - |
| | Upscale | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

LIMITS -- 5% [illegible] -- [illegible] -- [illegible]

| | | Cal. Analyzer Response | Cal Back/Upstream Analyzer Response | Bias Check % of Span |
|---|---|---|---|---|
| CO | Zero | 0 | 0.5 | 0.5 |
| | Upscale | 96.3 | 96.5 | 0.2 |
| NOx | Zero | 0.1 | 0 | -0.1 |
| | Upscale | 94 | 93.9 | -0.1 |

LIMIT -- 5%

Calibration Gases

| | Conc. Mid Cal | Conc. High Cal | Tank ID Mid | Tank ID High |
|---|---|---|---|---|
| CO | 55.5 | 96.6 | ALM018076 | CC-1081 |
| O2 | 3.02 | 22 | ALM027929 | ALM022375 |
| CO2 | 3 | 22 | ALM022375 | ALM027929 |
| NOx | 41.4 | 94.2 | ALM029356 | ALM02770 |
| SO2 | [illegible] | [illegible] | [illegible] | [illegible] |
| THC | 9.16 | 91.1 | ALM026969 | ALM02697 |

[illegible] Environmental Consultants
[illegible] Data Sheet

Firm OLD BETHPAGE LANDFILL
Location L. I. N.Y.
Tester SBK
Test No. T-3
Sample Loc. OUTLET
Date 11/10/92
[illegible] 1652-1652

Ambient Temp. [illegible]
[illegible] Temp. deg. F = [illegible]
Bar. Pressure [illegible]
Vacuum Gauge = [illegible]
Pressure Gauge =

Initial Values Final Values

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Zero | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| | Upscale | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| | Zero | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| | Upscale | 93.9 | 93.2 | [illegible] | 92.4 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| SO2 | Zero | - | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| | Upscale | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| | Zero | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| | Upscale | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

LIMITS [illegible]

| | | Cal. Back Analyzer Response | Upstream Analyzer Response | Bias Check % of Span | | Low Cal | High Cal | [illegible] | [illegible] |
|---|---|---|---|---|---|---|---|---|---|
| [illegible] | Zero | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| | Upscale | 96.3 | 96.6 | 0.2 | O2 | 3.02 | 22 | ALM0[illegible] | ALM0[illegible] |
| NOx | Zero | 0.1 | 0 | -0.1 | CO2 | 3 | 12 | ALM0[illegible] | ALM0[illegible] |
| | Upscale | 94 | [illegible].9 | -0.[illegible] | NOx | 42.4 | [illegible].2 | ALM0[illegible] | ALM0[illegible] |
| | | | | | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| | | LIMIT | [illegible] | | [illegible] | 9.16 | 91.[illegible] | ALM0[illegible] | ALM0[illegible] |

**VOLATILE ORGANIC EMISSIONS SUMMARY**
**OYSTER BAY SOLID WASTE DISPOSAL COMPLEX**
**NOVEMBER 10, 1992**

| filename: | RTPVOST1.WK3 | RUN NO.==> | VOST-O-1 | VOST-O-2 | VOST-O-3 | VOST-O-4 | |
|---|---|---|---|---|---|---|---|
| | | DATE==> | 11/10/92 | 11/10/92 | 11/10/92 | 11/10/92 | |
| | SAMPLING PARAMETERS | RUN TIME==> | 0930-1010 | 1024-1104 | 1117-1157 | 1207-1247 | AVERAGE |
| SYMBOL | MEASURED DATA | UNITS | | | | | |
| (Y) | Dry Gas Meter Calibration Factor | -- | 1.000 | 1.000 | 1.000 | 1.000 | |
| (Vi) | Initial Meter Volume | L | 7352.780 | 7373.210 | 7393.800 | 7413.860 | |
| (Vf) | Final Meter Volume | L | 7372.850 | 7393.600 | 7413.620 | 7433.650 | |
| (Vm) | Total Meter Volume | L | 20.070 | 20.390 | 19.820 | 19.790 | 20.093 |
| (t) | Sampling Time | min. | 40 | 40 | 40 | 40 | 40 |
| (Vwc) | Volume of Condensate Collected | mL | 0.0 | 1.0 | 1.0 | 0.0 | 0.7 |
| (Pbar) | Barometric Pressure | in. Hg | 29.87 | 29.87 | 29.87 | 29.87 | 29.87 |
| (Pg) | Stack Static Pressure | in. H2O | 0 | | | | 0.00 |
| (Ts) | Avg. Stack Gas Temperature | :::F | 1655.0 | | | | 1655.0 |
| (Tm) | Avg. Dry Gas Meter Temperature | :::C | 23.0 | 26.7 | 30.6 | 32.2 | 26.8 |
| (Tp) | Avg. Probe Temperature | :::C | 132.0 | 135.0 | 132.8 | 133.3 | 133.3 |
| (Ds) | Diameter of Stack | inches | 54.000 | | | | |
| (W) | Width of Stack | inches | 0.000 | | | | |
| (L) | Length of Stack | inches | 0.000 | | | | |
| (Cp) | Pitot Tube Coefficient | -- | 0.84 | | | | |
| (■p)½ | Avg. Square Root Velocity Head ■p | (in. H2O)½ | 0.122 | | | | |
| (%O2) | Stack Gas Oxygen | % | 9.5 | | | | 9.5 |
| (%CO2) | Stack Gas Carbon Dioxide | % | 10.0 | | | | 10.0 |
| (%N2) | Stack Gas Nitrogen | % | 80.5 | | | | 80.5 |
| (%Bws) | Stack Gas Moisture | % | 8.8 | | | | 8.8 |
| | CALCULATED DATA | | | | | | |
| (Vmstd) | Standard Dry Gas Meter Volume | L | 19.834 | 19.901 | 19.097 | 18.968 | 19.611 |
| (Md) | Dry Gas Molecular Weight | lb/lb-mole | 29.98 | | | | 29.98 |
| (Ms) | Wet Gas Molecular Weight | lb/lb-mole | 28.93 | | | | 28.93 |
| (vs) | Stack Gas Velocity | ft/s | 13.7 | | | | 13.7 |
| (A) | Stack Area | ft2 | 15.90 | | | | |
| (Qsd) | Volumetric Gas Flow Rate | dscfm | 3,000 | | | | 3,000 |
| (Qsd) | Volumetric Gas Flow Rate | dsm3/min | 85 | | | | 85 |
| (Qa) | Volumetric Gas Flow Rate | acfm | 13,000 | | | | 13,000 |
| (PQL) | Volatile Organic Compound Quantitation Limit = | | 20 ng | | | | |
| | VOLATILE ORGANIC EMISSIONS | | VOST-O-1 | VOST-O-2 | VOST-O-3 | VOST-O-4 | |
| | METHYLENE CHLORIDE Collected | ng | 45 | 25 | 22 | 35 | 31.8 |
| | MeCl2 Concentration | ug/dsm3 | 2.27 | 1.26 | 1.15 | 1.85 | 1.63 |
| | MeCl2 Emission Rate | lb/hr | 2.55E-05 | 1.41E-05 | 1.29E-05 | 2.07E-05 | 1.83E-05 |
| | MeCl2 Emission Rate | g/min | 1.93E-04 | 1.07E-04 | 9.79E-05 | 1.57E-04 | 1.39E-04 |
| | CARBON DISULFIDE Collected | ng | < 20 | < 20 | < 20 | 750 | < 202.5 |
| | CS2 Concentration | ug/dsm3 | < 1.01 | < 1.00 | < 1.05 | 39.54 | < 10.65 |
| | CS2 Emission Rate | lb/hr | < 1.13E-05 | < 1.13E-05 | < 1.18E-05 | 4.44E-04 | < 1.20E-04 |
| | CS2 Emission Rate | g/min | < 8.57E-05 | < 8.54E-05 | < 8.90E-05 | 3.36E-03 | < 9.05E-04 |
| | 1,1,1,-TCE Collected | ng | < 20 | < 20 | < 20 | 58 | < 29.5 |
| | 1,1,1,-TCE Concentration | ug/dsm3 | < 1.01 | < 1.00 | < 1.05 | 3.06 | < 1.53 |
| | 1,1,1,-TCE Emission Rate | lb/hr | < 1.13E-05 | < 1.13E-05 | < 1.18E-05 | 3.43E-05 | < 1.72E-05 |
| | 1,1,1,-TCE Emission Rate | g/min | < 8.57E-05 | < 8.54E-05 | < 8.90E-05 | 2.60E-04 | < 1.30E-04 |
| | BENZENE Collected | ng | < 20 | < 20 | < 20 | 52 | < 28.0 |
| | Benzene Concentration | ug/dsm3 | < 1.01 | < 1.00 | < 1.05 | 2.74 | < 1.45 |
| | Benzene Emission Rate | lb/hr | < 1.13E-05 | < 1.13E-05 | < 1.18E-05 | 3.08E-05 | < 1.63E-05 |
| | Benzene Emission Rate | g/min | < 8.57E-05 | < 8.54E-05 | < 8.90E-05 | 2.33E-04 | < 1.23E-04 |
| | TOLUENE Collected | ng | < 20 | < 20 | < 20 | 180 | < 60.0 |
| | TOLUENE Concentration | ug/dsm3 | < 1.01 | < 1.00 | < 1.05 | 9.49 | < 3.14 |
| | TOLUENE Emission Rate | lb/hr | < 1.13E-05 | < 1.13E-05 | < 1.18E-05 | 1.07E-04 | < 3.52E-05 |
| | TOLUENE Emission Rate | g/min | < 8.57E-05 | < 8.54E-05 | < 8.90E-05 | 8.06E-04 | < 2.67E-04 |
| | COMPOUNDS NOT DETECTED | ng | < 20 | < 20 | < 20 | < 20 | < 20.0 |
| | CPD Concentration | ug/dsm3 | < 1.01 | < 1.00 | < 1.05 | < 1.05 | < 1.03 |
| | CPD Emission Rate | lb/hr | < 1.13E-05 | < 1.13E-05 | < 1.18E-05 | < 1.18E-05 | < 1.15E-05 |
| | CPD Emission Rate | g/sec | < 8.57E-05 | < 8.54E-05 | < 8.90E-05 | < 8.96E-05 | < 8.74E-05 |

**VOLATILE ORGANIC EMISSIONS SUMMARY**
**OYSTER BAY SOLID WASTE DISPOSAL COMPLEX**
**NOVEMBER 10, 1992**

| filename: | RTPVOST2.WK3 | RUN NO.==> | VOST-O-5 | VOST-O-6 | VOST-O-7 | VOST-O-8 | |
|---|---|---|---|---|---|---|---|
| | | DATE==> | 11/10/92 | 11/10/92 | 11/10/92 | 11/10/92 | |
| | SAMPLING PARAMETERS | RUN TIME==> | 1320-1400 | 1410-1450 | 1500-1540 | 1550-1630 | AVERAGE |
| SYMBOL | MEASURED DATA | UNITS | | | | | |
| (Y) | Dry Gas Meter Calibration Factor | -- | 1.000 | 1.000 | 1.000 | 1.000 | |
| (Vi) | Initial Meter Volume | L | 7434.920 | 7454.500 | 7474.250 | 7494.280 | |
| (Vf) | Final Meter Volume | L | 7454.130 | 7474.000 | 7493.130 | 7514.200 | |
| (Vm) | Total Meter Volume | L | 19.210 | 19.500 | 18.880 | 19.920 | 19.197 |
| (t) | Sampling Time | min. | 40 | 40 | 40 | 40 | 40 |
| (Vwc) | Volume of Condensate Collected | mL | 0.0 | 2.0 | 0.0 | 0.0 | 0.7 |
| (Pbar) | Barometric Pressure | in. Hg | 29.87 | 29.87 | 29.87 | 29.87 | 29.87 |
| (Pg) | Stack Static Pressure | in. H2O | 0 | | | | |
| (Ts) | Avg. Stack Gas Temperature | °F | 1630.0 | | | | 1630.0 |
| (Tm) | Avg. Dry Gas Meter Temperature | °C | 27.8 | 26.1 | 24.4 | 21.1 | 26.1 |
| (Tp) | Avg. Probe Temperature | °C | 131.7 | 132.2 | 132.2 | 132.8 | 132.0 |
| (Ds) | Diameter of Stack | inches | 54.000 | | | | |
| (W) | Width of Stack | inches | 0.000 | | | | |
| (L) | Length of Stack | inches | 0.000 | | | | |
| (Cp) | Pitot Tube Coefficient | -- | 0.84 | | | | |
| (Δp)½ | Avg. Square Root Velocity Head Δp | (in. H2O)½ | 0.100 | | | | 0.1 |
| (%O2) | Stack Gas Oxygen | % | 9.5 | | | | 9.5 |
| (%CO2) | Stack Gas Carbon Dioxide | % | 9.9 | | | | 9.9 |
| (%N2) | Stack Gas Nitrogen | % | 80.6 | | | | 80.6 |
| (%Bws) | Stack Gas Moisture | % | 11.3 | | | | 11.3 |
| | CALCULATED DATA | | | | | | |
| (Vmstd) | Standard Dry Gas Meter Volume | L | 18.682 | 19.070 | 18.570 | 19.812 | 18.774 |
| (Md) | Dry Gas Molecular Weight | lb/lb-mole | 29.96 | | | | 29.96 |
| (Ms) | Wet Gas Molecular Weight | lb/lb-mole | 28.61 | | | | 28.61 |
| (vs) | Stack Gas Velocity | ft/s | 11.2 | | | | 11.2 |
| (A) | Stack Area | ft2 | 15.90 | | | | |
| (Qsd) | Volumetric Gas Flow Rate | dscfm | 2,300 | | | | 2,300 |
| (Qsd) | Volumetric Gas Flow Rate | dsm3/min | 65 | | | | 65 |
| (Qa) | Volumetric Gas Flow Rate | acfm | 10,700 | | | | 10,700 |
| (PQL) | Volatile Organic Compound Quantitation Limit = | | 20 ng | | | | |
| | VOLATILE ORGANIC EMISSIONS | | VOST-O-5 | VOST-O-6 | VOST-O-7 | VOST-O-8 | |
| | METHYLENE CHLORIDE Collected | ng | 30 | 28 | < 20 | < 20 | < 24.5 |
| | MeCl2 Concentration | ug/dsm3 | 1.61 | 1.47 | < 1.08 | < 1.01 | < 1.29 |
| | MeCl2 Emission Rate | lb/hr | 1.38E-05 | 1.26E-05 | < 9.27E-06 | < 8.69E-06 | < 1.11E-05 |
| | MeCl2 Emission Rate | g/min | 1.05E-04 | 9.56E-05 | < 7.01E-05 | < 6.57E-05 | < 8.40E-05 |
| | CARBON DISULFIDE Collected | ng | 46 | < 20 | < 20 | < 20 | < 26.5 |
| | CS2 Concentration | ug/dsm3 | 2.46 | < 1.05 | < 1.08 | < 1.01 | < 1.40 |
| | CS2 Emission Rate | lb/hr | 2.12E-05 | < 9.03E-06 | < 9.27E-06 | < 8.69E-06 | < 1.20E-05 |
| | CS2 Emission Rate | g/min | 1.60E-04 | < 6.83E-05 | < 7.01E-05 | < 6.57E-05 | < 9.11E-05 |
| | COMPOUNDS NOT DETECTED | ng | < 20 | < 20 | < 20 | < 20 | < 20.0 |
| | CPD Concentration | ug/dsm3 | < 1.07 | < 1.05 | < 1.08 | < 1.01 | < 1.05 |
| | CPD Emission Rate | lb/hr | < 9.21E-06 | < 9.03E-06 | < 9.27E-06 | < 8.69E-06 | < 9.05E-06 |
| | CPD Emission Rate | g/sec | < 6.97E-05 | < 6.83E-05 | < 7.01E-05 | < 6.57E-05 | < 6.85E-05 |

**VOLATILE ORGANIC EMISSIONS SUMMARY**
**OYSTER BAY SOLID WASTE DISPOSAL COMPLEX**
**NOVEMBER 10, 1992**

| filename: | VOSTPICS.wk1 | RUN NO.==> | VOST-O-9 | VOST-O-10 | VOST-O-11 | VOST-O-12 | |
|---|---|---|---|---|---|---|---|
| | | DATE==> | 11/10/92 | 11/10/92 | 11/10/92 | 11/10/92 | |
| | SAMPLING PARAMETERS | RUN TIME==> | 1652-1732 | 1740-1820 | 1830-1910 | 1920-2000 | AVERAGE |
| SYMBOL | MEASURED DATA | UNITS | | | | | |
| (Y) | Dry Gas Meter Calibration Factor | -- | 1.000 | 1.000 | 1.000 | 1.000 | |
| (Vi) | Initial Meter Volume | L | 7514.400 | 7534.500 | 7554.750 | 7574.400 | |
| (Vf) | Final Meter Volume | L | 7534.090 | 7554.470 | 7574.140 | 7593.630 | |
| (Vm) | Total Meter Volume | L | 19.690 | 19.970 | 19.390 | 19.230 | 19.683 |
| (t) | Sampling Time | min. | 40 | 40 | 40 | 40 | 40 |
| (Vwc) | Volume of Condensate Collected | mL | 0.0 | 0.0 | 2.0 | 1.0 | 0.7 |
| (Pbar) | Barometric Pressure | in. Hg | 29.87 | 29.87 | 29.87 | 29.87 | 29.87 |
| (Pg) | Stack Static Pressure | in. H2O | 0 | | | | |
| (Ts) | Avg. Stack Gas Temperature | °F | 1645.0 | | | | 1645.0 |
| (Tm) | Avg. Dry Gas Meter Temperature | °C | 19.4 | 22.2 | 23.3 | 22.2 | 21.6 |
| (Tp) | Avg. Probe Temperature | °C | 132.2 | 133.3 | 133.3 | 132.8 | 132.9 |
| (Ds) | Diameter of Stack | inches | 54.000 | | | | |
| (W) | Width of Stack | inches | 0.000 | | | | |
| (L) | Length of Stack | inches | 0.000 | | | | |
| (Cp) | Pitot Tube Coefficient | -- | 0.84 | | | | |
| (Δp)½ | Avg. Square Root Velocity Head Δp | (in. H2O)½ | 0.082 | | | | 0.08 |
| (%O2) | Stack Gas Oxygen | % | 9.7 | | | | 9.7 |
| (%CO2) | Stack Gas Carbon Dioxide | % | 9.8 | | | | 9.8 |
| (%N2) | Stack Gas Nitrogen | % | 80.5 | | | | 80.5 |
| (%Bws) | Stack Gas Moisture | % | 10.7 | | | | 10.7 |
| | CALCULATED DATA | | | | | | |
| (Vmstd) | Standard Dry Gas Meter Volume | L | 19.697 | 19.788 | 19.142 | 19.055 | 19.543 |
| (Md) | Dry Gas Molecular Weight | lb/lb-mole | 29.96 | | | | 29.96 |
| (Ms) | Wet Gas Molecular Weight | lb/lb-mole | 28.68 | | | | 28.68 |
| (vs) | Stack Gas Velocity | ft/s | 9.2 | | | | 9.2 |
| (A) | Stack Area | ft2 | 15.90 | | | | |
| (Qsd) | Volumetric Gas Flow Rate | dscfm | 2,000 | | | | 2,000 |
| (Qsd) | Volumetric Gas Flow Rate | dsm3/min | 57 | | | | 57 |
| (Qa) | Volumetric Gas Flow Rate | acfm | 8,800 | | | | 8,800 |
| (PQL) | Volatile Organic Compound Quantitation Limit = | | 20 ng | | | | |
| | COMPOUNDS NOT DETECTED | ng | < 20 | < 20 | < 20 | < 20 | < 20.0 |
| | CPD Concentration | ug/dsm3 | < 1.02 | < 1.01 | < 1.04 | < 1.05 | < 1.03 |
| | CPD Emission Rate | lb/hr | < 7.60E-06 | < 7.56E-06 | < 7.82E-06 | < 7.86E-06 | < 7.71E-06 |
| | CPD Emission Rate | g/sec | < 5.75E-05 | < 5.72E-05 | < 5.92E-05 | < 5.94E-05 | < 5.83E-05 |

# VOLATILE ORGANIC EMISSIONS SUMMARY (CONDENSATES)
## OYSTER BAY SOLID WASTE DISPOSAL COMPLEX
## NOVEMBER 10, 1992

| filename: | RTPCOND.WK3 | RUN NO.==> | VOST-1-4 | VOST-5-8 | VOST-9-12 | |
|---|---|---|---|---|---|---|
| | | DATE==> | 11/10/92 | 11/10/92 | 11/10/92 | |
| | SAMPLING PARAMETERS | RUN TIME==> | 0930-1247 | 1320-1630 | 1652-2000 | AVERAGE |
| SYMBOL | MEASURED DATA | UNITS | | | | |
| (Y) | Dry Gas Meter Calibration Factor | -- | 1.000 | 1.000 | 1.000 | |
| (Vi) | Initial Meter Volume | L | 7352.780 | 7434.920 | 7514.400 | |
| (Vf) | Final Meter Volume | L | 7433.650 | 7514.200 | 7593.630 | |
| (Vm) | Total Meter Volume | L | 80.870 | 79.280 | 79.230 | 79.793 |
| (t) | Sampling Time | min. | 160 | 160 | 160 | 160 |
| (Vwc) | Volume of Condensate Collected | mL | 2.0 | 3.0 | 3.0 | 2.7 |
| (Pbar) | Barometric Pressure | in. Hg | 29.87 | 29.87 | 29.87 | 29.87 |
| (Pg) | Stack Static Pressure | in. H2O | 0 | 0 | 0 | 0.0 |
| (Ts) | Avg. Stack Gas Temperature | :::F | 1655.0 | 1630.0 | 1645.0 | 1643.3 |
| (Tm) | Avg. Dry Gas Meter Temperature | :::C | 28.1 | 24.9 | 21.8 | 24.9 |
| (Tp) | Avg. Probe Temperature | :::C | 133.0 | 132.3 | 132.9 | 132.7 |
| (Ds) | Diameter of Stack | inches | 54.000 | 54.000 | 54.000 | 54.0 |
| (W) | Width of Stack | inches | 0.000 | 0.000 | 0.000 | 0.0 |
| (L) | Length of Stack | inches | 0.000 | 0.000 | 0.000 | 0.0 |
| (Cp) | Pitot Tube Coefficient | -- | 0.84 | 0.84 | 0.84 | 0.8 |
| (■p)½ | Avg. Square Root Velocity Head ■p | (in. H2O)½ | 0.120 | 0.100 | 0.080 | 0.100 |
| (%O2) | Stack Gas Oxygen | % | 9.5 | 9.5 | 9.7 | 9.6 |
| (%CO2) | Stack Gas Carbon Dioxide | % | 10.0 | 9.9 | 9.8 | 9.9 |
| (%N2) | Stack Gas Nitrogen | % | 80.5 | 80.6 | 80.5 | 80.5 |
| (%Bws) | Stack Gas Moisture | % | 8.8 | 11.3 | 10.7 | 10.3 |
| | CALCULATED DATA | | | | | |
| (Vmstd) | Standard Dry Gas Meter Volume | L | 78.559 | 77.860 | 78.622 | 78.347 |
| (Md) | Dry Gas Molecular Weight | lb/lb-mole | 29.98 | 29.96 | 29.96 | 29.97 |
| (Ms) | Wet Gas Molecular Weight | lb/lb-mole | 28.93 | 28.61 | 28.68 | 28.74 |
| (vs) | Stack Gas Velocity | ft/s | 13.5 | 11.2 | 9.0 | 11.2 |
| (A) | Stack Area | ft2 | 15.90 | 15.90 | 15.90 | 15.9 |
| (Qsd) | Volumetric Gas Flow Rate | dscfm | 3,000 | 2,300 | 2,000 | 2,433 |
| (Qsd) | Volumetric Gas Flow Rate | dsm3/min | 85 | 65 | 57 | 69 |
| (Qa) | Volumetric Gas Flow Rate | acfm | 12,900 | 10,700 | 8,600 | 10,733 |
| (PQL) | Volatile Organic Compound Quantitation Limit = | | 20 ng | | | |
| | VOLATILE ORGANIC EMISSIONS | | VOST-1-4 | VOST-5-8 | VOST-9-12 | |
| | METHYLENE CHLORIDE Collected | ng | | | 20 | < 7 |
| | MeCl2 Concentration | ug/dsm3 | | | 0.25 | < 0.08 |
| | MeCl2 Emission Rate | lb/hr | | | 2.86E-06 | < 9.52E-07 |
| | MeCl2 Emission Rate | g/min | | | 2.16E-05 | < 7.20E-06 |
| | COMPOUNDS NOT DETECTED | ug | < 20 | < 20 | < 20 | < 20.0 |
| | CPD Concentration | ug/dsm3 | < 0.25 | < 0.26 | < 0.25 | < 0.26 |
| | CPD Emission Rate | lb/hr | < 2.86E-06 | < 2.88E-06 | < 2.86E-06 | < 2.87E-06 |
| | CPD Emission Rate | g/sec | < 2.16E-05 | < 2.18E-05 | < 2.16E-05 | < 2.17E-05 |

# APPENDIX B

# PROCESS DATA

# THERMAL OXIDIZER OPERATION LOG

**SITE: TOWN OF OYSTER BAY THERMAL OXIDIZER** **DATE:** 11/10/92

| Time Hr/Min | Test/Run | Blower Vacuum (cfm) | Inlet Methane (%) | Inlet Oxygen (%) | Burner Temp (°F) | Burner Damper (% closed) | INITIALS/COMMENTS |
|---|---|---|---|---|---|---|---|
| 0930 | | 860/22 | 20% | — | 1602° | 95.5 | Willi Bonelli |
| 10:00 | | 860/22 | 20% | | 1613° | 93.9 | Willi Bonelli |
| 1030 | | 860/22 | 20% | | 1602° | 94.2 | Willi Bonelli |
| 11:00 | | 860/22 | 20% | | 1598° | 92.8 | Willi Bonelli |
| 11:30 | | 860/22 | 20% | | 1616° | 92.2 | Willi Bonelli |
| 12:00 | | 860/22 | 20% | | 1595° | 93.4 | Willi Bonelli |
| 1230 | | 860/22 | 20% | | 1593° | 90.9 | Willi Bonelli |
| 1300 | | 860/22 | 20% | | 1605° | 92.1 | Willi Bonelli |
| 1330 | | 860/22 | 20% | | 1604° | 90.6 | Willi Bonelli |
| 1400 | | 860/22 | 20% | | 1599° | 92.7 | Willi Bonelli |
| 1430 | | 860/22 | 20% | | 1605° | 91.2 | Willi Bonelli |
| 1500 | | 860/22 | 20% | | 1590 | 94.0 | Willi Bonelli |
| 1530 | | 860/22 | 20% | | 1595 | 95.2 | Willi Bonelli |
| 1600 | | 860/22 | 20% | | 1614° | 91.7 | Willi Bonelli |
| 1630 | | 860/22 | 20% | | 1593° | 93.6 | Willi Bonelli |

# THERMAL OXIDIZER OPERATION LOG

SITE: TOWN OF OYSTER BAY THERMAL OXIDIZER

DATE: 11/10/92

| Time Hr/Min | Test/Run | Blower Vacuum (cfm) | Inlet Methane (%) | Inlet Oxygen (%) | Burner Temp (°F) | Burner Damper (% closed) | INITIALS/COMMENTS |
|---|---|---|---|---|---|---|---|
| 1700 | | 860/22 | 20% | | 1588 | 93.2 | Willi Bonelli |
| 1730 | | 860/22 | 20% | | 1602 | 90.7 | Willi Bonelli |
| 1800 | | 860/22 | 20% | | 1600 | 90.3 | Willi Bonelli |
| 1830 | | 860/22 | 20% | | 1597 | 92.1 | Willi Bonelli |
| 1900 | | 860/22 | 20% | | 1599 | 92.2 | Willi Bonelli |
| 1930 | | 860/22 | 20% | | 1608 | 91.8 | Willi Bonelli |
| 2000 | | 860/22 | 20% | | 1612 | 92.4 | Willi Bonelli |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
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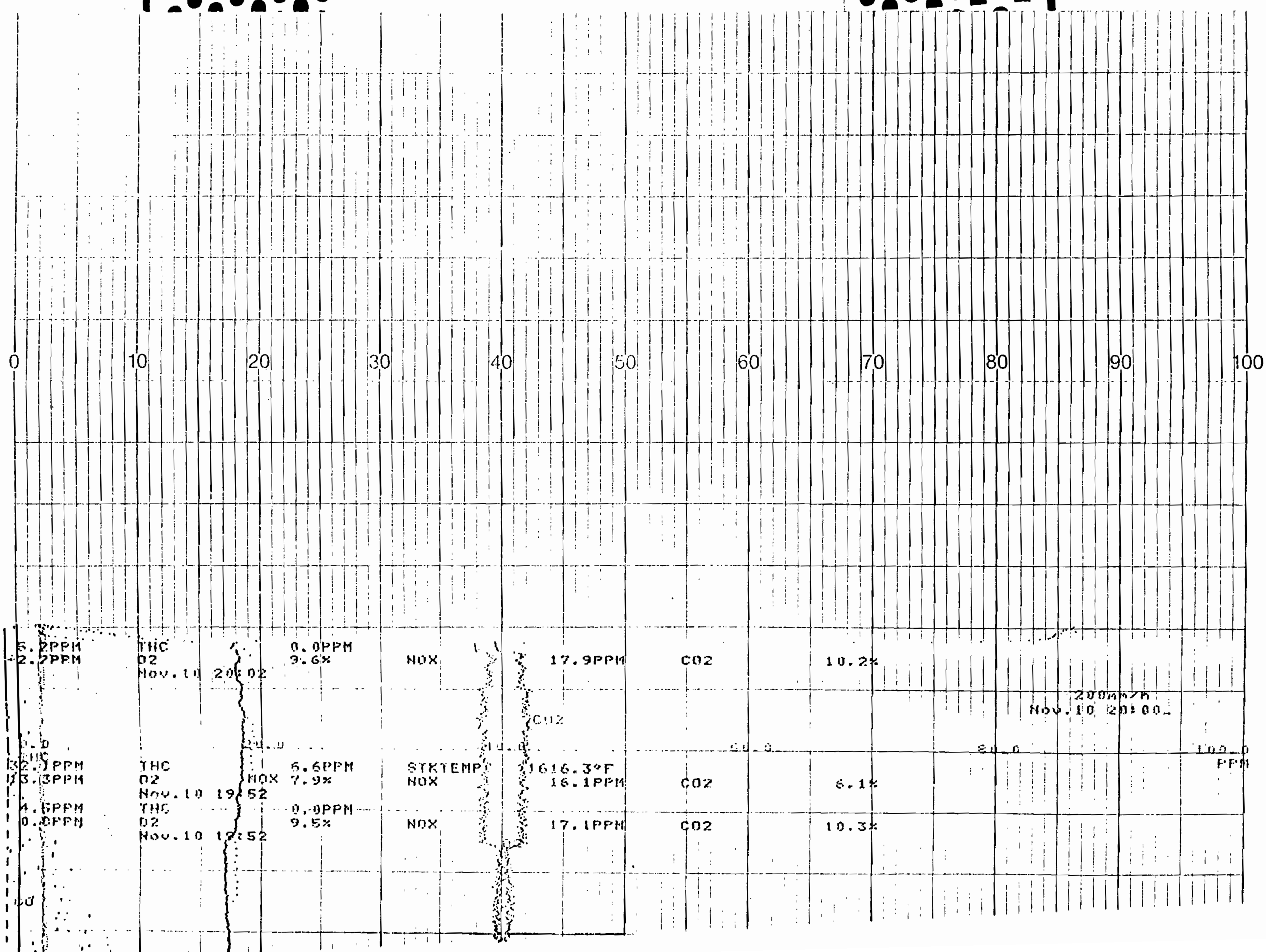
| | | | | | | | |

# APPENDIX C

# CEMS DATA


0
10
20
30
40
50
60
70
80
90
100
THC 0.0PPM
O2 9.6%
Nov.10 20:02
NOX 17.9PPM
CO2 10.2%
200mm/h
Nov.10 20:00
PPM
THC 6.6PPM
O2 7.9%
Nov.10 19:52
STKTEMP 1616.3°F
NOX 16.1PPM
CO2 6.1%
THC 0.0PPM
O2 9.5%
Nov.10 19:52
NOX 17.1PPM
CO2 10.3%

5.?PPM THC 1.0PPM NOX 17.9PPM CO2 10.2%
2.?PPM O2 ?.6%
Nov.10 20:02

200mm/h
Nov.10 20:00.

20.0 100.0 PPM

STKTEMP 1616.3°F
THC ?.6PPM NOX 16.1PPM CO2 6.1%
O2 ?.9%
Nov.10 19:52

THC ?.0PPM NOX 17.1PPM CO2 10.3%
O2 ?.5%
Nov.10 19:52

5.?PPM THC ?.0PPM NOX 18.3PPM CO2 10.3%
4.0PPM O2 ?.5%
Nov.10 19:42

18:59 19:40 200mm/h.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MANUAL | | Nov.10.92 | | 19:39 | | | |
| CO | 0.0PPM | O2 | 9.?% | NOX | 18.1PPM | CO2 | 10.1% |
| SO2 | 4.5PPM | THC | 100.1PPM | STKTEMP | 1616°F | MELTEMP | 69°F |
| CO | 16.8PPM | O2 | 7.0% | NOX | 17.7PPM | CO2 | 5.1% |
| SO2 | 39.3PPM | THC | 8.1PPM | STKTEMP | 1618.9°F | CO | 16.8PPM |
| O2 | 7.3% | NOX | 15.7PPM | CO2 | 5.1% | SO2 | 39.3PPM |
| THC | 8.1PPM | STKTEMP | 1618.5°F | | | | |
| MANUAL | | Nov.10.92 | | 19:37 | | | |
| CO | -2.2PPM | O2 | 9.7% | NOX | 18.0PPM | CO2 | 10.1% |
| SO2 | 4.5PPM | THC | 90.7PPM | STKTEMP | 1619°F | MELTEMP | 69°F |
| CO | 17.3PPM | O2 | 7.2% | NOX | 17.7PPM | CO2 | 4.9% |
| SO2 | 40.5PPM | THC | 7.8PPM | STKTEMP | 1618.4°F | CO | 17.3PPM |
| O2 | 7.2% | NOX | 15.7PPM | CO2 | 4.9% | SO2 | 40.5PPM |
| THC | 7.9PPM | STKTEMP | 1618.4°F | | | | |
| MANUAL | | Nov.10.92 | | 19:33 | | | |
| CO | -2.2PPM | O2 | 9.5% | NOX | 18.4PPM | CO2 | 10.3% |
| SO2 | 5.0PPM | THC | 1.8PPM | STKTEMP | 1620°F | MELTEMP | 66°F |
| CO | 18.0PPM | O2 | 7.1% | NOX | 15.0PPM | CO2 | 4.7% |
| SO2 | 41.8PPM | THC | 5.8PPM | STKTEMP | 1618.2°F | CO | 18.0PPM |
| O2 | 7.1% | NOX | 15.6PPM | CO2 | 4.7% | SO2 | 41.8PPM |
| THC | 5.8PPM | STKTEMP | 1618.2°F | | | | |
| MANUAL | | Nov.10.92 | | 19:32 | | | |
| CO | 5.7PPM | O2 | 22.7% | NOX | -8.1PPM | CO2 | 3.2% |
| SO2 | 4.0PPM | THC | 9.7PPM | STKTEMP | 1642°F | MELTEMP | 66°F |
| CO | 19.3PPM | O2 | 6.8% | NOX | 15.7PPM | CO2 | 4.4% |
| SO2 | 44.5PPM | THC | 5.6PPM | STKTEMP | 1617.9°F | CO | 19.3PPM |
| O2 | 6.3% | NOX | 15.7PPM | CO2 | 4.4% | SO2 | 44.5PPM |
| THC | 6.6PPM | STKTEMP | 1617.9°F | | | | |

MANUAL

0 10 20 30 40 50 60 70 80 90 100

BACK TO 5 THC D

ANALYZER THC MID

ANALYZER THC SPAN

ANALYZER THC ZERO

O2 SPAN
CO2 MID

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| O2 | [illegible] | NOX | [illegible] | | | | |
| THC | [illegible] | STKTEMP | [illegible] | | | | |

MANUAL Nov.10.92 19:3?

ANALYZER THC ZERO

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | -2.2PPM | O2 | ?.?% | NOX | 18.4PPM | CO2 | 10.3% |
| SO2 | 5.0PPM | THC | 1.8PPM | STKTEMP | 1?2?°F | MELTEMP | 66°F |
| CO | 18.0PPM | O2 | ?.?% | NOX | 15.6PPM | CO2 | 4.7% |
| SO2 | 41.8PPM | THC | 9.8PPM | STKTEMP | 161?.2°F | CO | 18.0PPM |
| O2 | 7.1% | NOX | 16.6PPM | CO2 | 4.7% | SO2 | 41.8PPM |
| THC | 5.8PPM | STKTEMP | 1618.2°F | | | | |

MANUAL Nov.10.92 19:32

O2 SPAN
CO2 MID

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 5.7PPM | O2 | 22.7% | NOX | -0.1PPM | CO2 | 3.2% |
| SO2 | 4.0PPM | THC | ?.?PPM | STKTEMP | 1642°F | MELTEMP | 66°F |
| CO | 19.3PPM | O2 | ?.8% | NOX | 15.7PPM | CO2 | 4.4% |
| SO2 | 44.5PPM | THC | 5.6PPM | STKTEMP | 1617.9°F | CO | 19.3PPM |
| O2 | 6.8% | NOX | 15.7PPM | CO2 | 4.4% | SO2 | 44.5PPM |
| THC | 5.6PPM | STKTEMP | 1617.0°F | | | | |

MANUAL Nov.10.92 19:30

CO2 SPAN
O2 MID

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | -2.2PPM | O2 | 3.0% | NOX | -0.1PPM | CO2 | 22.1% |
| SO2 | 4.0PPM | THC | 8.3PPM | STKTEMP | 1313°F | MELTEMP | 66°F |
| CO | 20.5PPM | O2 | 5.9% | NOX | 16.8PPM | CO2 | 4.3% |
| SO2 | 47.1PPM | THC | 5.4PPM | STKTEMP | 1617.7°F | CO | 20.5PPM |
| O2 | 5.9% | NOX | 16.8PPM | CO2 | 4.3% | SO2 | 47.1PPM |
| THC | 5.4PPM | STKTEMP | 1617.7°F | | | | |

0 10 20 30 40 50 60 70 80 90 100

MANUAL Nov.10.92 19:29

SO2 MID

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 4.2PPM | O2 | 0.0% | NOX | -0.1PPM | CO2 | 0.3% |
| SO2 | 91.7PPM | THC | 8.3PPM | STKTEMP | 1636°F | MELTEMP | 67°F |
| CO | 21.1PPM | O2 | 6.0% | NOX | 17.3PPM | CO2 | 3.9% |
| SO2 | 47.5PPM | THC | 5.3PPM | STKTEMP | 1617.8°F | CO | 21.1PPM |
| O2 | 6.0% | NOX | 17.3PPM | CO2 | 3.9% | SO2 | 47.5PPM |
| THC | 5.3PPM | STKTEMP | 1617.8°F | | | | |

MANUAL Nov.10.92 19:27

SO2 SPAN

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | -0.6PPM | O2 | 0.0% | NOX | 0.0PPM | CO2 | 0.3% |
| SO2 | 202.7PPM | THC | 10.7PPM | STKTEMP | 1310°F | MELTEMP | 68°F |
| CO | 21.9PPM | O2 | 6.3% | NOX | 18.0PPM | CO2 | 4.1% |
| SO2 | 43.2PPM | THC | 5.2PPM | STKTEMP | 1618.0°F | CO | 21.9PPM |
| O2 | 6.3% | NOX | 18.0PPM | CO2 | 4.1% | SO2 | 43.2PPM |
| THC | 5.2PPM | STKTEMP | 1618.0°F | | | | |

MANUAL Nov.10.92 19:25

THC SYSTEM SPAN

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 55.0PPM | O2 | 14.4% | NOX | -0.1PPM | CO2 | 0.3% |
| SO2 | 3.2PPM | THC | 91.8PPM | STKTEMP | 1636°F | MELTEMP | 70°F |
| CO | 20.7PPM | O2 | 6.1% | NOX | 19.1PPM | CO2 | 4.3% |
| SO2 | 40.4PPM | THC | 3.8PPM | STKTEMP | 1618.2°F | CO | 20.7PPM |
| O2 | 6.1% | NOX | 19.1PPM | CO2 | 4.3% | SO2 | 40.4PPM |
| THC | 3.8PPM | STKTEMP | 1618.2°F | | | | |

MANUAL Nov.10.92 19:2?

CO RACK MID

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 56.5PPM | O2 | 14.5% | NOX | -0.1PPM | CO2 | 0.3% |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | CO2 | 0.3% |
| | | | | | | MELTEMP | 70°F |
| | | | | | | | 4.3% |
| | | | | | | | 20.7PPM |

THC SYSTEM SPAN

CO RACK MID

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | CO2 | 0.3% |
| | | | | | | MELTEMP | 70°F |
| | | O2 | | | 19.9PPM | CO2 | 4.5% |
| | | THC | | STKTEMP | 1618.2°F | CO | 19.1PPM |
| | 1.8% | NOX | 11.9PPM | CO2 | 4.6% | SO2 | 41.9PPM |
| | 2.2PPM | STKTEMP | 1618.2°F | | | | |

THC SYSTEM ZERO

MANUAL Nov.10.92 19:20

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 25.7PPM | O2 | 0.0% | NOX | -1.1PPM | CO2 | 0.3% |
| SO2 | [illegible] | THC | 5.8PPM | STKTEMP | 1617°F | MELTEMP | 72°F |
| CO | 13.8PPM | O2 | 5.0% | NOX | 27.7PPM | CO2 | 5.0% |
| SO2 | 46.1PPM | THC | 1.6PPM | STKTEMP | 1618.2°F | CO | 13.8PPM |
| O2 | 5.0% | NOX | 22.2PPM | CO2 | 5.0% | SO2 | 46.1PPM |
| THC | 1.6PPM | STKTEMP | 1618.2°F | | | | |

CO SPAN
NOX ZERO

0 10 20 30 40 50 60 70 80 90 100

MANUAL Nov.10.92 19:18

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 4.6PPM | O2 | 0.0% | NOX | 42.7PPM | CO2 | 0.3% |
| SO2 | 3.7PPM | THC | 10.0PPM | STKTEMP | 1613°F | MELTEMP | 72°F |
| CO | 8.5PPM | O2 | 5.5% | NOX | 23.0PPM | CO2 | 5.4% |
| SO2 | 49.8PPM | THC | 1.0PPM | STKTEMP | 1613.3°F | CO | 8.5PPM |
| O2 | 5.5% | NOX | 23.0PPM | CO2 | 5.4% | SO2 | 49.8PPM |
| THC | 1.0PPM | STKTEMP | 1618.3°F | | | | |

NOX MID

MANUAL Nov.10.92 19:16

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | -0.6PPM | O2 | 0.0% | NOX | 94.4PPM | CO2 | 0.3% |
| SO2 | 0.2PPM | THC | 4.7PPM | STKTEMP | 1605°F | MELTEMP | 72°F |
| CO | 8.9PPM | O2 | 5.9% | NOX | 19.7PPM | CO2 | 5.8% |
| SO2 | 53.8PPM | THC | 0.4PPM | STKTEMP | 1618.7°F | CO | 8.9PPM |
| O2 | 5.9% | NOX | 19.7PPM | CO2 | 5.8% | SO2 | 53.8PPM |
| THC | 0.4PPM | STKTEMP | 1618.7°F | | | | |

NOX SPAN
ZEROS

RACK

MANUAL Nov.10.92 19:13

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 1.2PPM | O2 | 22.4% | NOX | -0.2PPM | CO2 | 3.3% |
| SO2 | 5.7PPM | THC | 1.9PPM | STKTEMP | 1599°F | MELTEMP | 71°F |
| CO | 9.9PPM | O2 | 5.5% | NOX | 16.5PPM | CO2 | 6.4% |
| SO2 | 60.5PPM | THC | 0.1PPM | STKTEMP | 1622.3°F | CO | 9.9PPM |
| O2 | 5.5% | NOX | 16.5PPM | CO2 | 6.4% | SO2 | 60.5PPM |
| THC | 0.1PPM | STKTEMP | 1622.3°F | | | | |

O2 SPAN

MANUAL Nov.10.92 19:11

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 4.2PPM | O2 | 3.1% | NOX | -0.1PPM | CO2 | 22.2% |
| SO2 | 9.5PPM | THC | 1.7PPM | STKTEMP | 1595°F | MELTEMP | [illegible]°F |
| CO | 10.8PPM | O2 | 4.5% | NOX | 10.0PPM | CO2 | 6.2% |
| SO2 | 65.4PPM | THC | -0.1PPM | STKTEMP | 1624.9°F | CO | 10.8PPM |
| O2 | [illegible]% | NOX | [illegible]PPM | CO2 | [illegible]% | SO2 | 65.4PPM |

CO2 SPAN

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| O2 | [illegible] | NOX | [illegible] | CO2 | [illegible] | CO2 | [illegible] |
| THC | 0.4PPM | STKTEMP | 1618.[illegible]°F | | | | |

| MANUAL | Nov.10.92 | 19:13 | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 1.2PPM | O2 | 22.4% | NOX | -0.2PPM | CO2 | 0.3% |
| SO2 | 5.7PPM | THC | 1.7PPM | STKTEMP | 1588°F | MELTEMP | 71°F |
| CO | 9.9PPM | O2 | 5.5% | NOX | 16.0PPM | CO2 | 6.4% |
| SO2 | 60.5PPM | THC | 0.1PPM | STKTEMP | 1622.3°F | CO | 9.9PPM |
| O2 | 5.5% | NOX | 16.5PPM | CO2 | 6.4% | SO2 | 60.5PPM |
| THC | 0.1PPM | STKTEMP | 1622.3°F | | | | |

O2 SPAN

| MANUAL | Nov.10.92 | 19:11 | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 4.2PPM | O2 | 3.1% | NOX | -0.1PPM | CO2 | 22.2% |
| SO2 | 9.5PPM | THC | 1.7PPM | STKTEMP | 1595°F | MELTEMP | 69°F |
| CO | 10.8PPM | O2 | 4.5% | NOX | 18.0PPM | CO2 | 6.2% |
| SO2 | 65.4PPM | THC | -0.1PPM | STKTEMP | 1624.9°F | CO | 10.8PPM |
| O2 | 4.5% | NOX | 18.0PPM | CO2 | 6.2% | SO2 | 65.4PPM |
| THC | -0.1PPM | STKTEMP | 1624.9°F | | | | |

CO2 SPAN

| MANUAL | Nov.10.92 | 19:09 | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 4.2PPM | O2 | 0.1% | NOX | 0.0PPM | CO2 | 0.3% |
| SO2 | 227.7PPM | THC | 1.4PPM | STKTEMP | 1419°F | MELTEMP | 69°F |
| CO | 11.9PPM | O2 | 4.7% | NOX | 20.0PPM | CO2 | 5.1% |
| SO2 | 61.9PPM | THC | -0.2PPM | STKTEMP | 1627.1°F | CO | 11.9PPM |
| O2 | 4.7% | NOX | 20.0PPM | CO2 | 5.1% | SO2 | 61.9PPM |
| THC | -0.2PPM | STKTEMP | 1627.1°F | | | | |

SO2 SPAN

0 10 20 30 40 50 60 70 80 90 100

| MANUAL | Nov.10.92 | 19:04 | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 95.4PPM | O2 | -0.1% | NOX | 0.4PPM | CO2 | 0.3% |
| SO2 | 2.5PPM | THC | -0.8PPM | STKTEMP | 1631°F | MELTEMP | 68°F |
| CO | 11.2PPM | O2 | 6.9% | NOX | 23.2PPM | CO2 | 7.3% |
| SO2 | 3.6PPM | THC | -0.6PPM | STKTEMP | 1626.8°F | CO | 11.2PPM |
| O2 | 6.9% | NOX | 23.2PPM | CO2 | 7.3% | SO2 | 3.6PPM |
| THC | -0.6PPM | STKTEMP | 1626.8°F | | | | |

CO SPAN
NOX ZERO

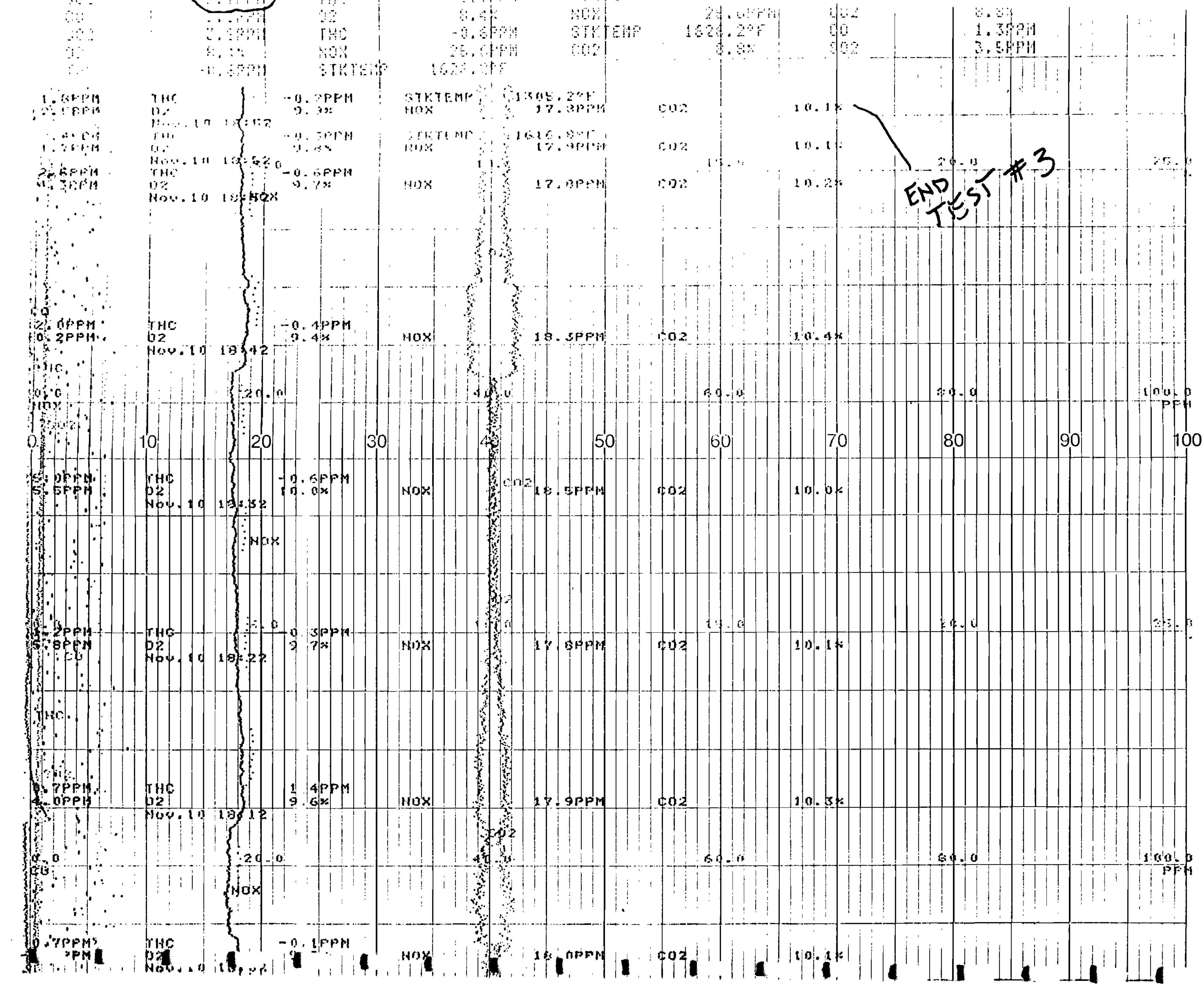
| MANUAL | Nov.10.92 | 19:01 | | | | | |
|---|---|---|---|---|---|---|---|
| CO | -0.7PPM | O2 | 0.1% | NOX | 92.4PPM | CO2 | 0.3% |
| SO2 | 2.7PPM | THC | -0.7PPM | STKTEMP | 1624°F | MELTEMP | [illegible]2°F |
| CO | 1.3PPM | O2 | 8.4% | NOX | 25.6PPM | CO2 | 8.8% |
| SO2 | 3.5PPM | THC | -0.6PPM | STKTEMP | 1626.2°F | CO | 1.3PPM |
| O2 | 8.4% | NOX | 25.6PPM | CO2 | 8.8% | SO2 | 3.5PPM |
| THC | -0.6PPM | STKTEMP | 1626.2°F | | | | |

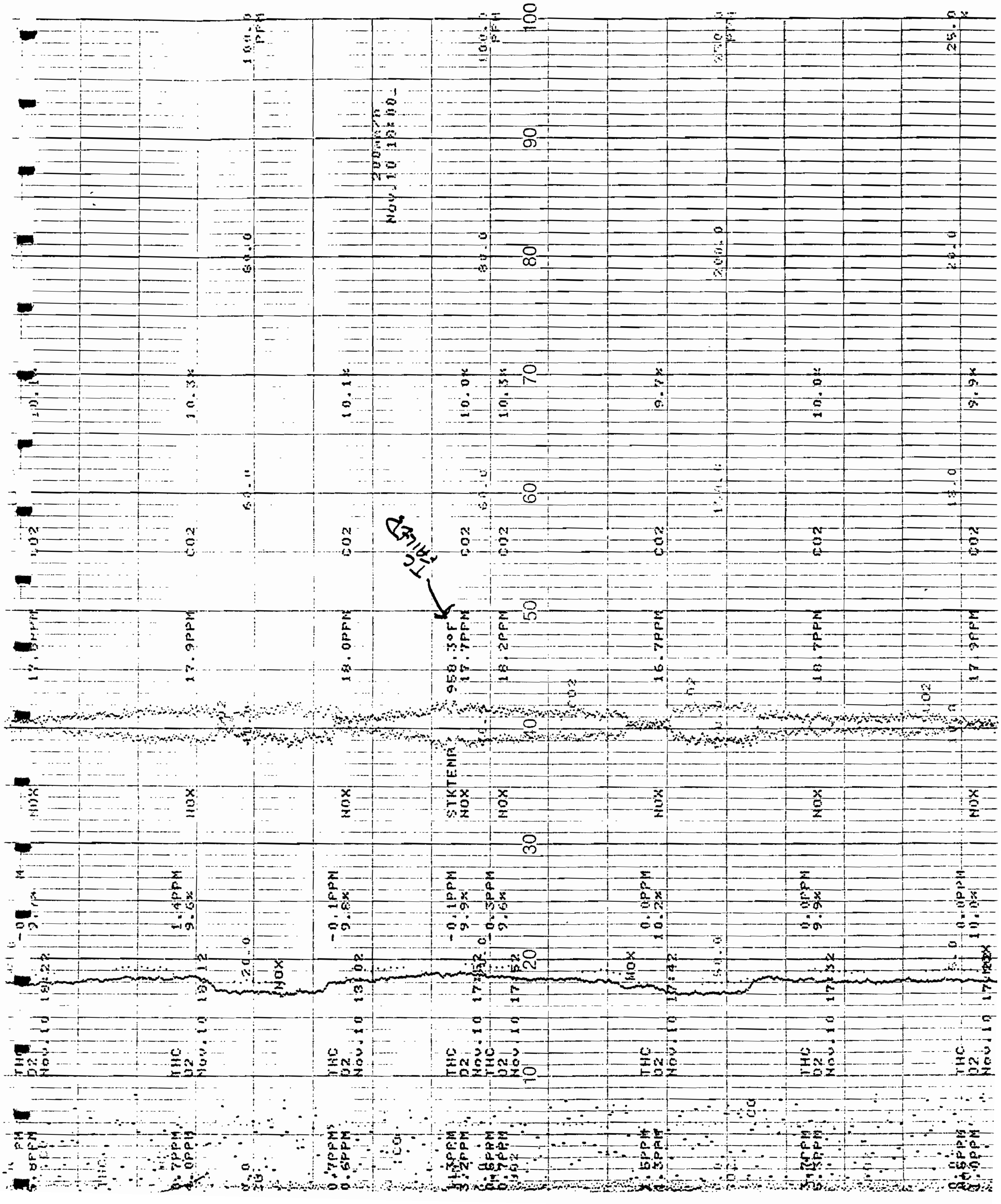
NOX SPAN
ZEROS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1[illegible].8PPM | THC | -0.2PPM | STKTEMP | 1305.2°F | | | |
| 2[illegible].5PPM | O2 | 9.9% | NOX | 17.8PPM | CO2 | 10.1% | |
| | Nov.10 18:52 | | | | | | |
| 2[illegible].4PPM | THC | -0.3PPM | STKTEMP | 1516.8°F | | | |
| 1[illegible].7PPM | O2 | 9.8% | NOX | 17.9PPM | CO2 | 10.1% | |
| | Nov.10 18:52 | | | | | | |
| 2[illegible].8PPM | THC | -0.6PPM | | | | | |
| [illegible].3PPM | O2 | 9.7% | NOX | 17.8PPM | CO2 | 10.2% | |
| | Nov.10 18:52 | | | | | | |

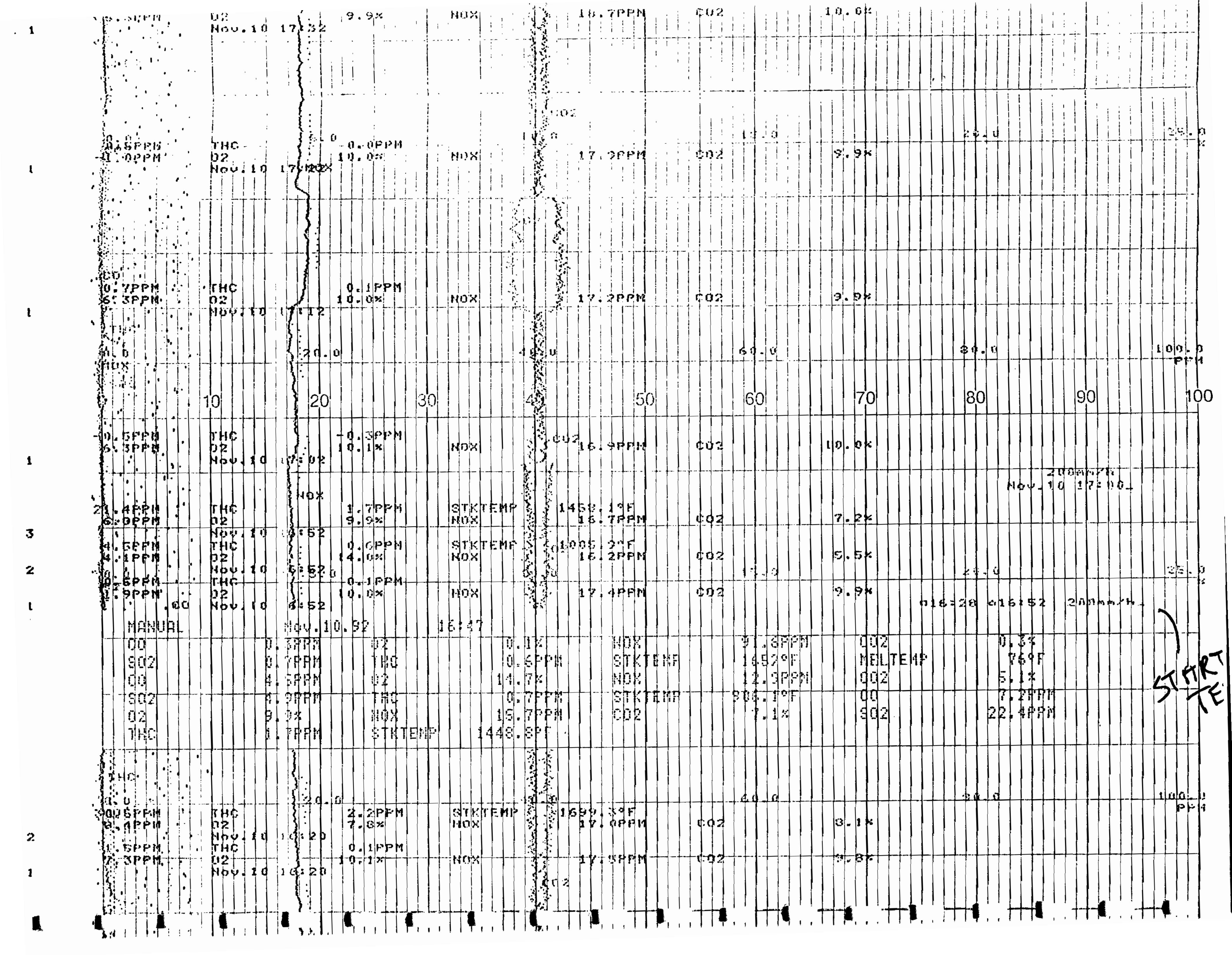
15.0 20.0 25.0

END TEST #3

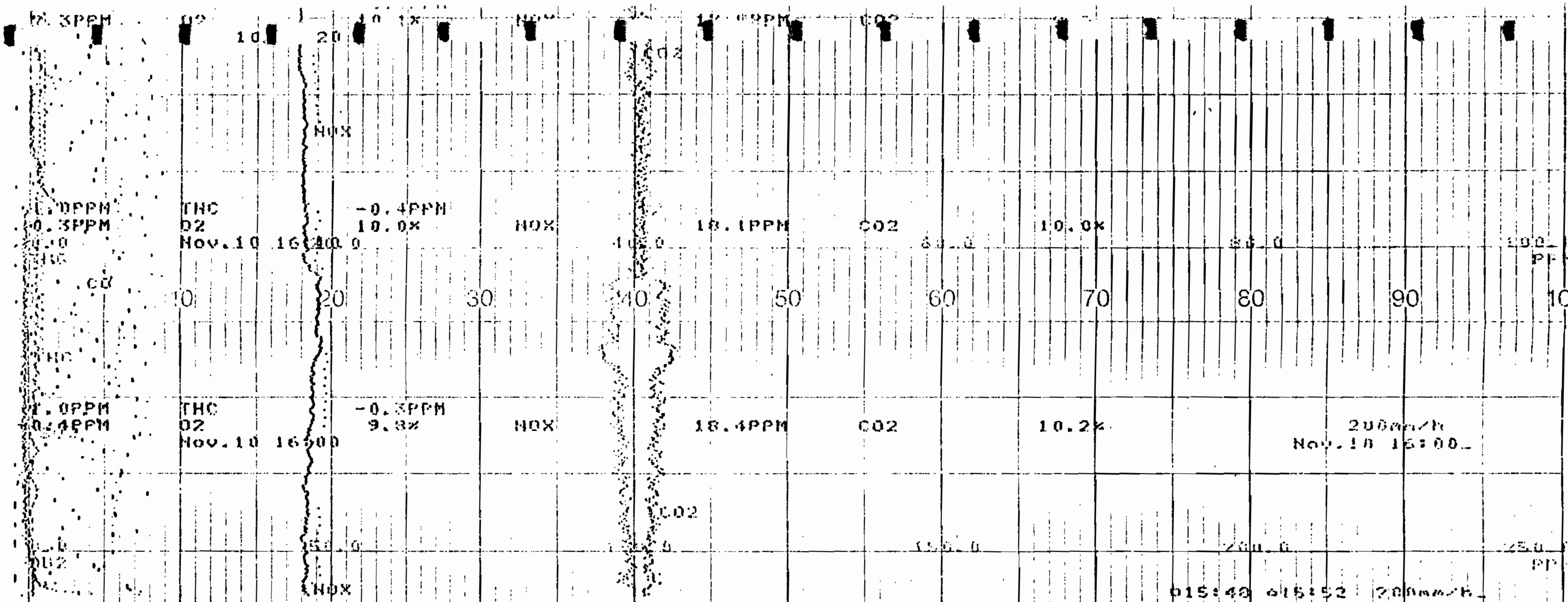

END TEST #3
THC
O2
Nov.10 18:42
-0.4PPM
9.4%
NOX
18.3PPM
CO2
10.4%
Nov.10 18:32
-0.6PPM
10.0%
18.5PPM
10.0%
Nov.10 18:22
-0.3PPM
9.7%
17.6PPM
10.1%
Nov.10 18:12
1.4PPM
9.6%
17.9PPM
10.3%
-0.1PPM
16.0PPM
10.1%
STKTEMP
1305.2°F
17.3PPM
10.1%
1616.9°F
17.9PPM
-0.6PPM
9.7%
17.0PPM
10.2%
0
10
20
30
40
50
60
70
80
90
100
100.0 PPM



100
90
80
70
60
50
40
30
20
10
CO2
NOX
THC
O2
STKTEMP
958.3°F
17.7PPM
10.0%



O2 9.9% NOX 18.7PPM CO2 10.0%
Nov.10 17:32
0.6PPM THC 0.0PPM
11.0PPM O2 10.0% NOX 17.2PPM CO2 9.9%
Nov.10 17:22
CO
0.7PPM THC 0.1PPM
6.3PPM O2 10.0% NOX 17.2PPM CO2 9.9%
Nov.10 17:12
20.0 40.0 60.0 80.0 100.0 PPM
10 20 30 40 50 60 70 80 90 100
0.5PPM THC -0.3PPM
6.3PPM O2 10.1% NOX 16.9PPM CO2 10.0%
Nov.10 17:02
200mm/h
Nov.10 17:00
21.4PPM THC 1.7PPM STKTEMP 1458.1°F
6.0PPM O2 9.9% NOX 16.7PPM CO2 7.2%
Nov.10 16:52
4.6PPM THC 0.6PPM STKTEMP 1005.2°F
4.1PPM O2 14.0% NOX 16.2PPM CO2 5.5%
Nov.10 16:52
0.6PPM THC 0.1PPM
1.9PPM O2 10.0% NOX 17.4PPM CO2 9.9%
Nov.10 16:52
16:28 16:52 200mm/h
MANUAL Nov.10.92 16:47
CO 0.3PPM O2 0.1% NOX 91.6PPM CO2 0.3%
SO2 0.7PPM THC 0.6PPM STKTEMP 1457°F MELTEMP 76°F
CO 4.5PPM O2 14.7% NOX 12.3PPM CO2 5.1%
SO2 4.9PPM THC 0.7PPM STKTEMP 904.1°F CO 7.2PPM
O2 9.9% NOX 15.7PPM CO2 7.1% SO2 22.4PPM
THC 1.7PPM STKTEMP 1448.8°F
START TE
THC
20.0 40.0 60.0 80.0 100.0 PPM
0.5PPM THC 2.2PPM STKTEMP 1699.3°F
8.4PPM O2 7.8% NOX 17.0PPM CO2 3.1%
Nov.10 16:20
1.5PPM THC 0.1PPM
7.3PPM O2 10.1% NOX 17.5PPM CO2 9.8%
Nov.10 16:20




MANUAL Nov.10.92 15:51

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | -1.1PPM | O2 | 9.7% | NOX | 13.1PPM | CO2 | 10.1% |
| SO2 | 7.7PPM | THC | 91.1PPM | STKTEMP | 1721°F | MELTEMP | 71°F |
| CO | 13.2PPM | O2 | 5.9% | NOX | 15.9PPM | CO2 | 6.3% |
| SO2 | 56.4PPM | THC | 2.1PPM | STKTEMP | 1698.5°F | CO | 13.2PPM |
| O2 | 5.9% | NOX | 15.9PPM | CO2 | 6.3% | SO2 | 56.4PPM |
| THC | 2.1PPM | STKTEMP | 1698.5°F | | | | |

MANUAL Nov.10.92 15:49

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | -0.3PPM | O2 | 9.9% | NOX | 17.9PPM | CO2 | 10.1% |
| SO2 | 1.7PPM | THC | 90.1PPM | STKTEMP | 1691°F | MELTEMP | 78°F |
| CO | 13.8PPM | O2 | 5.7% | NOX | 15.8PPM | CO2 | 6.0% |
| SO2 | 59.5PPM | THC | 0.5PPM | STKTEMP | 1698.5°F | CO | 13.8PPM |
| O2 | 5.7% | NOX | 15.5PPM | CO2 | 6.0% | SO2 | 59.5PPM |
| THC | 0.5PPM | STKTEMP | 1698.5°F | | | | |

MANUAL Nov.10.92 15:46

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 6.2PPM | O2 | 22.4% | NOX | ~~[illegible].3PPM~~ | CO2 | 3.3% |
| SO2 | 2.7PPM | THC | 1.7PPM | STKTEMP | 1687°F | MELTEMP | 78°F |
| CO | 15.2PPM | O2 | 5.0% | NOX | 14.0PPM | CO2 | 5.5% |
| SO2 | 67.1PPM | THC | 0.5PPM | STKTEMP | 1699.2°F | CO | 15.2PPM |
| O2 | 5.0% | NOX | 16.0PPM | CO2 | 5.5% | SO2 | 67.1PPM |
| THC | 0.5PPM | STKTEMP | 1699.2°F | | | | |

O2 SPAN

MANUAL Nov.10.92 15:44

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 0.0PPM | O2 | 3.2% | NOX | [illegible].3PPM | CO2 | 22.3% |
| SO2 | 1.7PPM | THC | 1.1PPM | STKTEMP | 1682°F | MELTEMP | [illegible]°F |
| CO | 15.9PPM | O2 | 4.5% | NOX | 14.9PPM | CO2 | 5.3% |
| SO2 | [illegible]PPM | THC | 0.4PPM | STKTEMP | [illegible] | CO | [illegible] |

CO2 SPAN

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| O2 | ?.?PPM | O2 | 0.1% | NOX | ?.6PPM | CO2 | 0.2% | | | |
| SO2 | ???.?PPM | THC | 1.1PPM | STKTEMP | 1480°F | MELTEMP | 79°F | | | |
| CO | 17.?PPM | O2 | 4.?% | NOX | 18.5PPM | CO2 | 4.0% | | | |
| SO2 | 70.?PPM | THC | 0.3PPM | STKTEMP | 170?.7°F | CO | 17.3PPM | | | |
| O2 | 4.7% | NOX | 18.5PPM | CO2 | .0% | SO2 | 70.3PPM | | | |
| THC | 0.?PPM | STKTEMP | 1700.7°F | | | | | | | |

SO2 SPAN

MANUAL Nov.10.92 15:33

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 95.?PPM | O2 | 0.1% | NOX | ?.5PPM | CO2 | 0.2% |
| SO2 | 0.?PPM | THC | 0.1PPM | STKTEMP | 1??°F | MELTEMP | 79°F |
| CO | 18.?PPM | O2 | ?.?% | NOX | 3?.2PPM | CO2 | 6.5% |
| SO2 | 2.1PPM | THC | -0.1PPM | STKTEMP | 170?.9°F | CO | 18.4PPM |
| O2 | 6.?% | NOX | ?.?PPM | CO2 | 6.5% | SO2 | 2.1PPM |
| THC | -0.1PPM | STKTEMP | 170?.?°F | | | | |

CO SPAN
NOx ZERO

MANUAL Nov.10.92 15:3?

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | ?.?PPM | O2 | 0.?% | NOX | 9?.2PPM | CO2 | 0.3% |
| SO2 | 0.?PPM | THC | 0.0PPM | STKTEMP | 1??°F | MELTEMP | 77°F |
| CO | ?.?PPM | O2 | 8.0% | NOX | 29.6PPM | CO2 | 8.?% |
| SO2 | 2.?PPM | THC | -0.1PPM | STKTEMP | 169?.3°F | CO | 4.3PPM |
| O2 | 8.?% | NOX | 29.6PPM | CO2 | 8.2% | SO2 | 2.5PPM |
| THC | -0.?PPM | STKTEMP | 1698.3°F | | | | |

NOX SPAN
ZERO

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.6PPM | THC | 0.3PPM | STKTEMP | 1676.8°F | | | | |
| 4.7PPM | O2 | 9.8% | NOX | 17.8PPM | CO2 | 10.1% | | |
| 3 | Nov.10 15:20 | | | | | | | |
| 2.8PPM | THC | 0.2PPM | STKTEMP | 1689.2°F | | | | |
| 4.4PPM | O2 | 9.3% | NOX | 17.3PPM | CO2 | 10.1% | | |
| 2 | Nov.10 15:20 | | | | | | | |
| 0.0PPM | THC | -0.1PPM | | | | | | |
| 8.0PPM | O2 | 9.9% | NOX | 17.6PPM | CO2 | 10.1% | | |
| 1 CO | Nov.10 15:20 | | | | | | | |

0 10 20 30 40 50 60 70 80 90 100

0.0 15.0 20.0 25.0

END TEST 2

| | | | | | | |
|---|---|---|---|---|---|---|
| 4.6PPM | THC | 0.0PPM | | | | |
| 2.5PPM | O2 | 9.6% | NOX | 18.4PPM | CO2 | 10.3% |
| 1 | Nov.10 15:10 | | | | | |

CO2

0.0 20.0 40.0 60.0 80.0 100.0 PPM

NOX

NOX

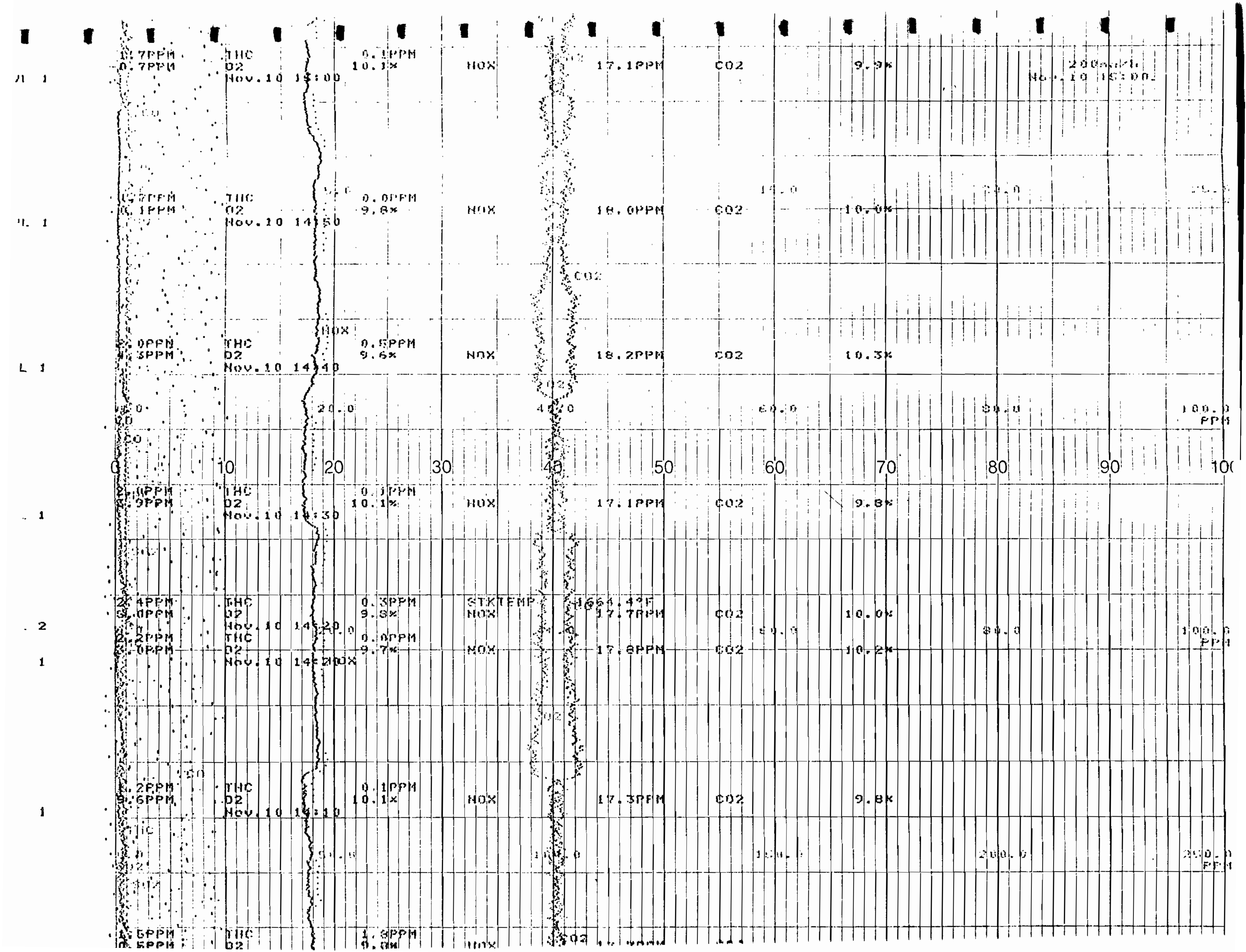
| | | | | | | |
|---|---|---|---|---|---|---|
| 1.7PPM | THC | 0.1PPM | | | | |
| -0.7PPM | O2 | 10.1% | NOX | 17.1PPM | CO2 | 9.9% |
| 1 | Nov.10 15:00 | | | | | |

200mm/h
Nov.10 15:00

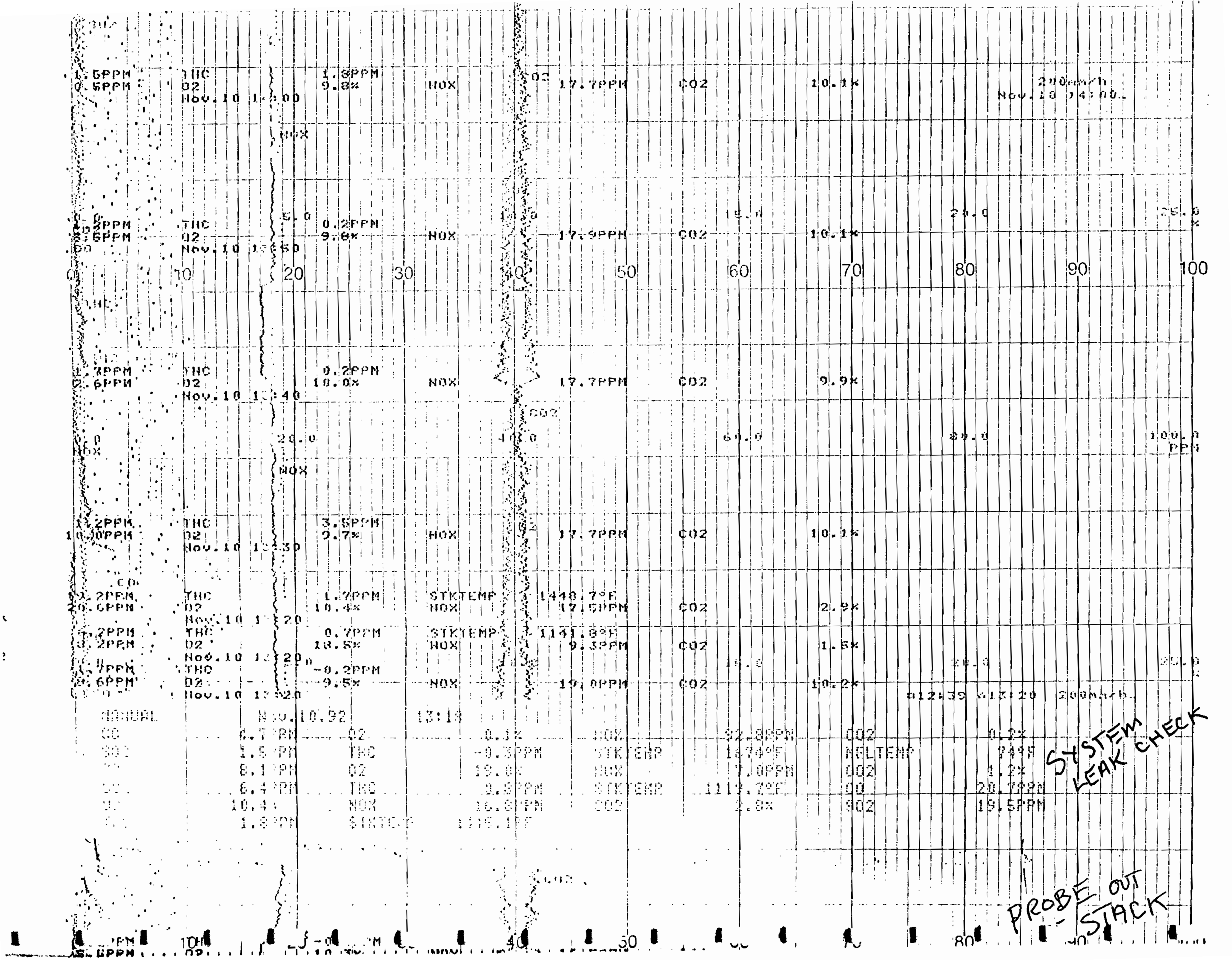
CO

THC

0.0 10.0 15.0 20.0 25.0



THC
O2
Nov.10 15:00
0.1PPM
10.1%
NOX
17.1PPM
CO2
9.9%
THC
O2
Nov.10 14:50
0.0PPM
9.8%
NOX
18.0PPM
CO2
10.0%
THC
O2
Nov.10 14:40
0.5PPM
9.6%
NOX
18.2PPM
CO2
10.3%
20.0
40.0
60.0
80.0
100.0
PPM
0
10
20
30
40
50
60
70
80
90
100
THC
O2
Nov.10 14:30
0.1PPM
10.1%
NOX
17.1PPM
CO2
9.8%
THC
O2
Nov.10 14:20
0.3PPM
9.8%
STKTEMP
NOX
17.7PPM
CO2
10.0%
THC
O2
0.0PPM
9.7%
NOX
17.8PPM
CO2
10.2%
THC
O2
Nov.10 14:10
0.1PPM
10.1%
NOX
17.3PPM
CO2
9.8%
THC
O2



1.5PPM THC 1.8PPM NOX 17.7PPM CO2 10.1%
0.5PPM O2 9.8%
Nov.10 13:00
200mm/h Nov.10 14:00
NOX
0.2PPM THC 0.2PPM NOX 17.9PPM CO2 10.1%
8.6PPM O2 9.8%
Nov.10 12:50
5.0 10.0 15.0 20.0 25.0
0 10 20 30 40 50 60 70 80 90 100
THC
1.7PPM THC 0.2PPM NOX 17.7PPM CO2 9.9%
2.6PPM O2 10.0%
Nov.10 12:40
CO2
0.0 20.0 40.0 60.0 80.0 100.0 PPM
NOX
NOX
1.2PPM THC 3.5PPM NOX 17.7PPM CO2 10.1%
10.0PPM O2 9.7%
Nov.10 12:30
CO
2.2PPM THC 1.7PPM STKTEMP 1448.7°F
20.6PPM O2 10.4% NOX 17.5PPM CO2 2.9%
Nov.10 12:20
3.2PPM THC 0.7PPM STKTEMP 1141.8°F
3.2PPM O2 13.5% NOX 9.3PPM CO2 1.5%
Nov.10 12:20
1.7PPM THC -0.2PPM
8.6PPM O2 9.5% NOX 19.0PPM CO2 10.2%
Nov.10 12:20
5.0 10.0 15.0 20.0 25.0
12:39 13:20 200mm/h
MANUAL Nov.10.92 13:18
CO 6.7PPM O2 0.1% NOX 92.8PPM CO2 0.2%
SO2 1.5PPM THC -0.3PPM STKTEMP 1674°F MELTEMP 74°F
8.1PPM O2 19.0% NOX 7.0PPM CO2 1.2%
6.4PPM THC 0.8PPM STKTEMP 1112.7°F CO 20.7PPM
10.4% NOX 16.8PPM CO2 2.8% SO2 19.5PPM
1.8PPM STKTEMP 1115.1°F
SYSTEM LEAK CHECK
PROBE OUT STACK

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MANUAL | Nov.10.92 | | 12:24 | | | | |
| CO | 96.7PPM | O2 | 0.1% | NOX | 0.2PPM | CO2 | 0.2% |
| SO2 | 0.0PPM | THC | -0.5PPM | STKTEMP | 1602°F | MELTEMP | 78°F |
| CO | 34.0PPM | O2 | 2.9% | NOX | 25.7PPM | CO2 | 2.6% |
| SO2 | 30.5PPM | THC | 2.9PPM | STKTEMP | 1683.4°F | CO | 34.0PPM |
| O2 | 2.9% | NOX | 25.7PPM | CO2 | 2.6% | SO2 | 30.5PPM |
| THC | 2.9PPM | STKTEMP | 1683.4°F | | | | |

CO ~~ZER~~ SPAN
~~O2~~ SO2 ZERO ADJUSTMENT

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MANUAL | Nov.10.92 | | 12:17 | | | | |
| CO | 0.0PPM | O2 | 22.7% | NOX | 0.0PPM | CO2 | 3.1% |
| SO2 | 0.5PPM | THC | 3.7PPM | STKTEMP | 1697°F | MELTEMP | 75°F |
| CO | 24.8PPM | O2 | 3.2% | NOX | 27.7PPM | CO2 | 3.1% |
| SO2 | 37.7PPM | THC | 3.7PPM | STKTEMP | 1683.4°F | CO | 24.8PPM |
| O2 | 3.2% | NOX | 27.7PPM | CO2 | 3.1% | SO2 | 37.7PPM |
| THC | 3.7PPM | STKTEMP | 1683.4°F | | | | |

O2 SPAN

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MANUAL | Nov.10.92 | | 12:13 | | | | |
| CO | -0.5PPM | O2 | 3.1% | NOX | 0.0PPM | CO2 | 22.2% |
| SO2 | 0.0PPM | THC | 0.7PPM | STKTEMP | 1706°F | MELTEMP | 77°F |
| CO | 27.6PPM | O2 | 1.1% | NOX | 31.2PPM | CO2 | 2.8% |
| SO2 | 42.2PPM | THC | 4.1PPM | STKTEMP | 1681.0°F | CO | 27.6PPM |
| O2 | 1.1% | NOX | 31.2PPM | CO2 | 2.8% | SO2 | 42.2PPM |
| THC | 4.1PPM | STKTEMP | 1681.0°F | | | | |

CO2 SPAN

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MANUAL | Nov.10.92 | | 12:10 | | | | |
| CO | -2.2PPM | O2 | 0.2% | NOX | 0.3PPM | CO2 | 0.2% |
| SO2 | 227.7PPM | THC | 2.7PPM | STKTEMP | 1699°F | MELTEMP | 76°F |
| CO | 31.0PPM | O2 | 1.0% | NOX | 35.0PPM | CO2 | 0.8% |
| SO2 | 42.4PPM | THC | 4.4PPM | STKTEMP | 1680.4°F | CO | 31.0PPM |
| O2 | 1.0% | NOX | 35.0PPM | CO2 | 0.8% | SO2 | 42.4PPM |
| THC | 4.4PPM | STKTEMP | 1680.4°F | | | | |

SO2 SPAN

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MANUAL | Nov.10.92 | | 12:02 | | | | |
| CO | 94.1PPM | O2 | 0.1% | NOX | 0.2PPM | CO2 | 0.2% |
| SO2 | [illegible] | THC | 0.0PPM | STKTEMP | 1607°F | MELTEMP | 72°F |
| CO | 35.7PPM | O2 | 0.9% | NOX | 48.2PPM | CO2 | 1.0% |
| SO2 | -5.9PPM | THC | 5.7PPM | STKTEMP | 1683.8°F | CO | 35.7PPM |
| O2 | 0.9% | NOX | 48.2PPM | CO2 | 1.0% | SO2 | -5.9PPM |
| THC | 5.7PPM | STKTEMP | 1683.8°F | | | | |

CO SPAN
NOx ZERO

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MANUAL | Nov.10.92 | | 11:59 | | | | |
| CO | 91.7PPM | O2 | 0.1% | NOX | 0.4PPM | CO2 | 0.2% |
| SO2 | -8.0PPM | THC | 1.6PPM | STKTEMP | 1630°F | MELTEMP | 67°F |
| CO | 26.9PPM | O2 | 1.1% | NOX | 56.3PPM | CO2 | 1.1% |
| SO2 | -5.7PPM | THC | 6.5PPM | STKTEMP | 1684.2°F | CO | 26.9PPM |
| O2 | 1.1% | NOX | 56.3PPM | CO2 | 1.1% | SO2 | -5.7PPM |
| THC | 6.5PPM | STKTEMP | 1684.2°F | | | | |

MANUAL Nov.10.92 11:58

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 91.7PPM | O2 | 0.1% | NOX | 0.4PPM | CO2 | 0.2% |
| SO2 | -8.0PPM | THC | 1.6PPM | STKTEMP | 1680°F | MELTEMP | 67°F |
| CO | 26.9PPM | O2 | 1.1% | NOX | 56.3PPM | CO2 | 1.1% |
| SO2 | -5.7PPM | THC | 6.5PPM | STKTEMP | 1684.2°F | CO | 26.9PPM |
| O2 | 1.1% | NOX | 56.3PPM | CO2 | 1.1% | SO2 | -5.7PPM |
| THC | 6.5PPM | STKTEMP | 1684.2°F | | | | |

MANUAL No. 10.92 11:58

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 90.7PPM | O2 | 0.2% | NOX | .2PPM | CO2 | 0.2% |
| SO2 | -8.7PPM | THC | 90.5PPM | STKTEMP | 1680°F | MELTEMP | 67°F |
| CO | 24.2PPM | O2 | 1.1% | NOX | 59.7PPM | CO2 | 1.1% |
| SO2 | -5.7PPM | THC | 5.3PPM | STKTEMP | 1684.3°F | CO | 24.2PPM |
| O2 | 1.1% | NOX | 59.7PPM | CO2 | 1.1% | SO2 | -5.7PPM |
| THC | 5.3PPM | STKTEMP | 1684.3°F | | | | |

THC SPAN

MANUAL No. 10.92 11:53

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 88.9PPM | O2 | 0.1% | NOX | 0.6PPM | CO2 | 0.2% |
| SO2 | -8.2PPM | THC | -0.5PPM | STKTEMP | 1680°F | MELTEMP | 69°F |
| CO | 18.4PPM | O2 | 1.2% | NOX | 64.0PPM | CO2 | 1.2% |
| SO2 | -5.4PPM | THC | 0.6PPM | STKTEMP | 1684.3°F | CO | 18.4PPM |
| O2 | 1.2% | NOX | 64.0PPM | CO2 | 1.2% | SO2 | -5.4PPM |
| THC | 0.6PPM | STKTEMP | 1684.3°F | | | | |

THC ZERO

MANUAL No. 10.92 11:52

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | -0.6PPM | O2 | 0.1% | NOX | 90.0PPM | CO2 | 0.2% |
| SO2 | -7.2PPM | THC | 0.7PPM | STKTEMP | [illegible] | MELTEMP | 68°F |
| CO | 0.8PPM | O2 | 1.6% | NOX | 77.6PPM | CO2 | 1.6% |
| SO2 | -5.0PPM | THC | 0.7PPM | STKTEMP | 1685.2°F | CO | 0.8PPM |
| O2 | 1.6% | NOX | 77.6PPM | CO2 | 1.6% | SO2 | -5.0PPM |
| THC | 0.7PPM | STKTEMP | 1685.2°F | | | | |

NOx SPAN ZEROS SYSTEM

0 10 20 30 40 50 60 70 80 90 100

MANUAL No. 10.92 11:52

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 0.2PPM | O2 | 0.1% | NOX | 91.1PPM | CO2 | 0.2% |
| SO2 | -6.7PPM | THC | 1.3PPM | STKTEMP | 1679°F | MELTEMP | 69°F |
| CO | 0.9PPM | O2 | 1.6% | NOX | 77.0PPM | CO2 | 1.6% |
| SO2 | -4.9PPM | THC | 0.7PPM | STKTEMP | 1685.7°F | CO | 0.9PPM |
| O2 | 1.6% | NOX | 77.0PPM | CO2 | 1.6% | SO2 | -4.9PPM |
| THC | 0.7PPM | STKTEMP | 1685.7°F | | | | |

MANUAL No. 10.92 11:49

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | -2.2PPM | O2 | 0.1% | NOX | [illegible] | CO2 | 0.2% |
| SO2 | -5.2PPM | THC | 0.5PPM | STKTEMP | [illegible] | MELTEMP | 73°F |
| CO | 1.1PPM | O2 | 2.1% | NOX | 73.2PPM | CO2 | 2.1% |
| SO2 | -4.4PPM | THC | 0.6PPM | STKTEMP | 1688.0°F | CO | 1.1PPM |
| O2 | 2.1% | NOX | 73.2PPM | CO2 | 2.1% | SO2 | -4.4PPM |
| THC | 0.6PPM | STKTEMP | 1688.0°F | | | | |

CO

-0.6PPM THC 1.9PPM STKTEMP 1673.0°F

-4.8PPM O2 7.7% NOX 18.1PPM CO2 10.2%

Nov. 10 11:30

-1.8PPM THC 0.6PPM STKTEMP 1667.4°F

3.4PPM O2 9.7% NOX 18.1PPM CO2 10.2%

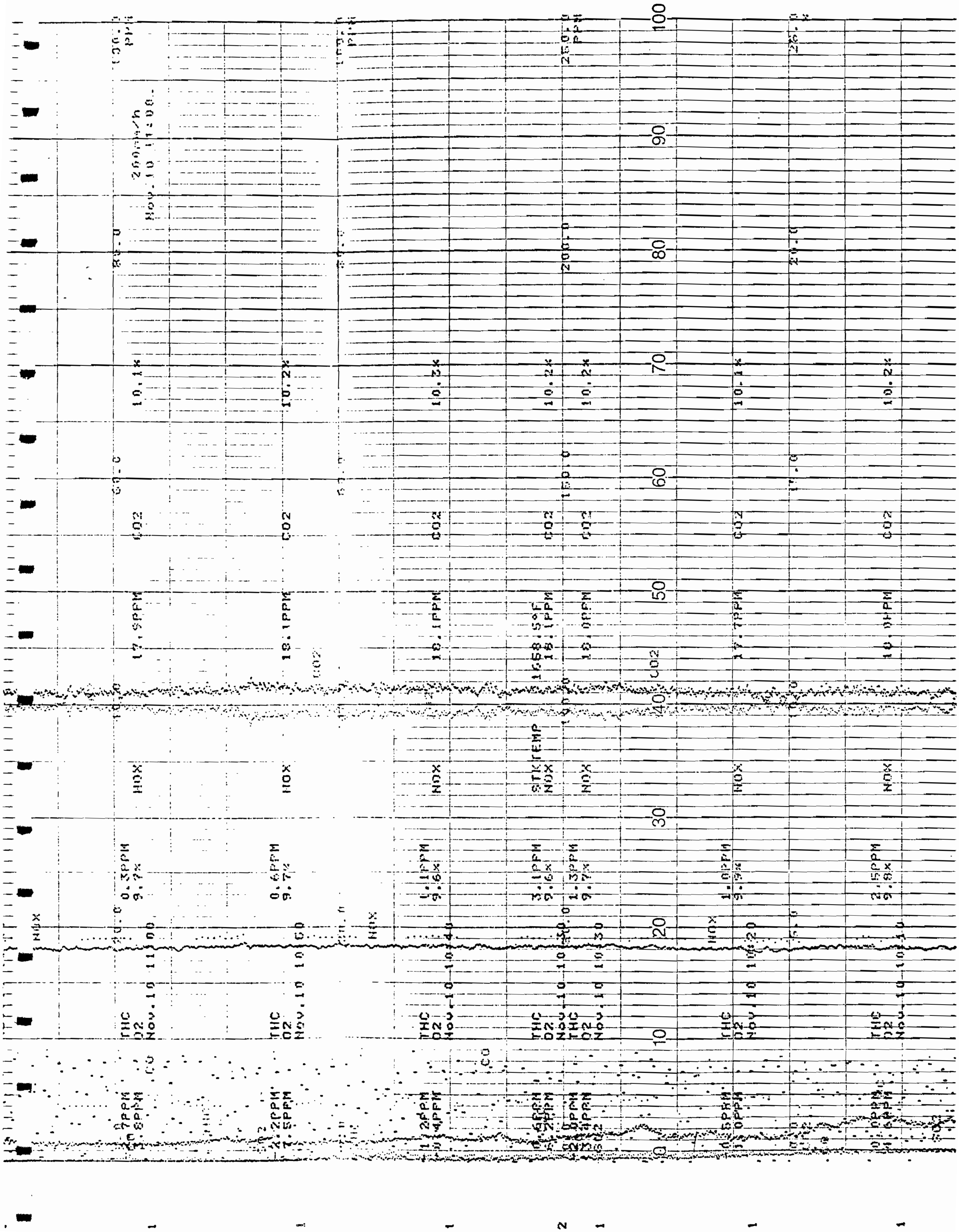
Nov. 10 11:30

THC

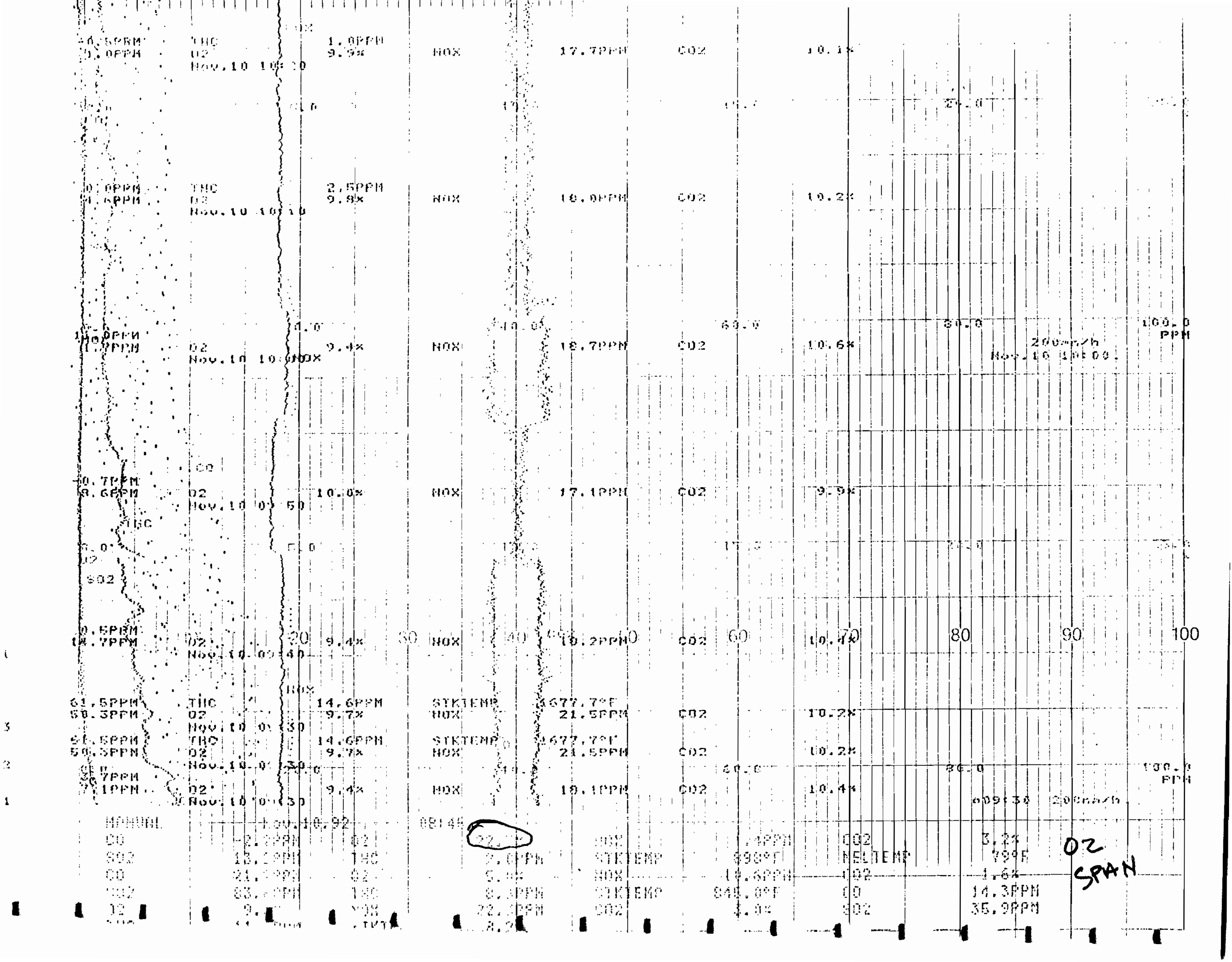
O2

A11:41 200mm/h

100.0 PPM



0
10
20
30
40
50
60
70
80
90
100
THC
O2
NOX
CO2
CO
STK TEMP



THC 1.0PPM
O2 9.9%
Nov.10 10:20
NOX 17.7PPM
CO2 10.1%
THC 2.5PPM
O2 9.8%
Nov.10 10:10
NOX 18.0PPM
CO2 10.2%
O2 9.4%
Nov.10 10:00
NOX 18.7PPM
CO2 10.6%
100.0 PPM
200mm/h
Nov.10 10:00
O2 10.0%
Nov.10 09:50
NOX 17.1PPM
CO2 9.9%
O2 9.4%
Nov.10 09:40
NOX 18.2PPM
CO2 10.4%
20 30 40 50 60 70 80 90 100
61.5PPM
58.3PPM
THC 14.6PPM
O2 9.7%
Nov.10 09:30
STKTEMP 677.7°F
NOX 21.5PPM
CO2 10.2%
O2 9.4%
Nov.10 09:30
NOX 18.1PPM
CO2 10.4%
09:30 200mm/h
MANUAL
Nov.10.92
08:45
CO
SO2
CO
CO2
O2
NOX
STKTEMP
NOX
STKTEMP
SO2
CO2
NELTEMP
HO2
CO
SO2
3.2%
799F
1.6%
14.3PPM
35.9PPM
O2 SPAN

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SO2 | 1[illegible]PPM | THC | 2.[illegible]PPM | [illegible] | [illegible] | [illegible] | 79[illegible] | SPAN |
| CO | 21.2PPM | O2 | 5.0% | NOX | 1[illegible]PPM | CO2 | [illegible].6% | |
| SO2 | 83.6PPM | THC | 8.3PPM | STKTEMP | 84[illegible].0°F | CO | 14.3PPM | |
| O2 | 9.3% | NOX | 22.3PPM | CO2 | [illegible].9% | SO2 | 35.9PPM | |
| THC | 11.0PPM | STKTEMP | 1358.2°F | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| MANUAL | Nov.10.92 | | 08:44 | | | | | |
| CO | -2.2PPM | O2 | 3.1% | NOX | 0.3PPM | CO2 | 22.2% | CO2 SPAN |
| SO2 | 8.2PPM | THC | 1.1PPM | STKTEMP | 795°F | MELTEMP | 76°F | |
| CO | 22.2PPM | O2 | 4.7% | NOX | 11.0PPM | CO2 | 1.1% | |
| SO2 | 871.0PPM | THC | 8.7PPM | STKTEMP | 845.5°F | CO | 14.5PPM | |
| O2 | 9.3% | NOX | 22.6PPM | CO2 | 2.8% | SO2 | 36.3PPM | |
| THC | 11.2PPM | STKTEMP | 1364.6°F | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| MANUAL | Nov.10.92 | | 08:42 | | | | | |
| CO | 3.0PPM | O2 | 0.1% | NOX | 0.6PPM | CO2 | 0.1% | THC SPAN |
| SO2 | 229.5PPM | THC | 91.3PPM | STKTEMP | 790°F | MELTEMP | 78°F | SO2 SPAN |
| CO | 24.0PPM | O2 | [illegible] | NOX | 11.8PPM | CO2 | 0.1% | |
| SO2 | 85.3PPM | THC | 8.8PPM | STKTEMP | 847.6°F | CO | 14.8PPM | |
| O2 | 9.4% | NOX | 23.1PPM | CO2 | 2.6% | SO2 | 34.7PPM | |
| THC | 11.4PPM | STKTEMP | 1377.5°F | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| MANUAL | Nov.10.92 | | 08:40 | | | | | |
| CO | -1.1PPM | O2 | 0.0% | NOX | 0.6PPM | CO2 | 0.1% | SYSTEM |
| SO2 | 219.7PPM | THC | -0.2PPM | STKTEMP | 762°F | MELTEMP | 81°F | THC ZERO |
| CO | 26.5PPM | O2 | 0.4% | NOX | 13.1PPM | CO2 | 0.2% | |
| SO2 | 60.8PPM | THC | 7.8PPM | STKTEMP | 85[illegible].6°F | CO | 15.2PPM | |
| O2 | 9.7% | NOX | 2[illegible].8PPM | CO2 | [illegible] | SO2 | 29.1PPM | |
| THC | 11.0PPM | STKTEMP | 13[illegible].0°F | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| MANUAL | Nov.10.92 | | 08:31 | | | | | |
| CO | 96.7PPM | O2 | 0.0% | NOX | 0.3PPM | CO2 | 0.1% | CO SPAN |
| SO2 | 1.2PPM | THC | 0.6PPM | STKTEMP | [illegible] | MELTEMP | 81°F | NOx ZERO |
| CO | 34.3PPM | O2 | 8.7% | NOX | 20.9PPM | CO2 | 0.2% | |
| SO2 | 0.2PPM | THC | 12.7PPM | STKTEMP | 909.9°F | CO | 15.3PPM | |
| O2 | 10.8% | NOX | 26.4PPM | CO2 | 1.0% | SO2 | 11.5PPM | |
| THC | 13.2PPM | STKTEMP | 1466.8°F | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| MANUAL | [illegible]10.92 | | 08:26 | | | | | |
| CO | 0.9PPM | O2 | [illegible] | NOX | 91.7PPM | CO2 | 0.1% | SYSTEM |
| SO2 | -1.2PPM | THC | 11.3PPM | STKTEMP | [illegible] | MELTEMP | 80°F | NOX SPAN |
| CO | 2.5PPM | O2 | 1[illegible].5% | NOX | 2[illegible].9PPM | CO2 | 0.2% | ZEROS |
| SO2 | 0.2PPM | THC | 21.0PPM | STKTEMP | 101[illegible].9°F | CO | 10.1PPM | |
| O2 | 11.7% | NOX | 2[illegible].1PPM | CO2 | [illegible].3% | SO2 | 12.6PPM | |
| THC | 15.1PPM | STKTEMP | 152[illegible].5°F | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| MANUAL | Nov.10.92 | | 08:22 | | | | | |
| CO | -0.9PPM | O2 | [illegible] | NOX | 3.4PPM | CO2 | 0.2% | THC |
| SO2 | -0.7PPM | THC | 9.7PPM | STKTEMP | 850°F | MELTEMP | 80°F | MID |
| CO | 2.8PPM | O2 | [illegible] | NOX | [illegible].5PPM | CO2 | 0.2% | |
| SO2 | 0.0PPM | THC | 35.0PPM | STKTEMP | 117[illegible].4°F | CO | 10.5PPM | |
| O2 | 11.9% | NOX | 25.8PPM | CO2 | [illegible] | SO2 | 15.2PPM | |
| THC | 16.0PPM | STKTEMP | 1563.5°F | | | | | |

CO 0.0PPM O2 21.2% NOX 0.4PPM CO2 0.2%
SO2 -0.5PPM THC 58.7PPM STK TEMP 1300°F MELTEMP 79°F
CO 2.5PPM O2 [illegible] NOX 0.4PPM CO2 0.2%
SO2 0.2PPM THC 58.4PPM STK TEMP 1313.8°F CO 10.7PPM
O2 11.7% NOX 26.5PPM CO2 3.6% SO2 13.6PPM
THC 16.1PPM STKTEMP 1580.6°F

THC SPAN

MANUAL Nov.10.92 08:19
CO -0.4PPM O2 21.[illegible] NOX 0.3PPM CO2 0.2%
SO2 0.7PPM THC 0.[illegible] STKTEMP 1387°F MELTEMP 79°F
CO 6.8PPM O2 21.[illegible] NOX 0.4PPM CO2 0.2%
SO2 11.3PPM THC -0.9PPM STK TEMP 1390.9°F CO 11.0PPM
O2 11.4% NOX 27.3PPM CO2 [illegible] SO2 14.0PPM
THC 15.0PPM STKTEMP 1590.0°F

THC ANALYZ ZERO

MANUAL Nov.10.92 08:15
CO 3.8PPM O2 0.0% NOX 99.3PPM CO2 0.1%
SO2 -2.0PPM THC 6.2PPM STK TEMP 1399°F MELTEMP 79°F
CO 11.6PPM O2 11.1% NOX 27.2PPM CO2 4.0%
SO2 14.9PPM THC 14.4PPM STK TEMP 1601.2°F CO 11.6PPM
O2 11.1% NOX 27.2PPM CO2 4.0% SO2 14.9PPM
THC 16.4PPM STKTEMP 1601.2°F

CO2 ZERO

MANUAL Nov.10.92 08:11
CO -2.2PPM O2 [illegible] NOX [illegible] CO2 22.3%
SO2 -2.0PPM THC 6.2PPM STKTEMP 1631°F MELTEMP 79°F
CO 11.8PPM O2 11.3% NOX 27.0PPM CO2 3.9%
SO2 15.3PPM THC 14.8PPM STKTEMP 1605.0°F CO 11.8PPM
O2 11.3% NOX 27.0PPM CO2 3.9% SO2 15.3PPM
THC 14.8PPM STKTEMP 1605.0°F

CO2 SPAN

MANUAL Nov.10.92 08:0[illegible]
CO [illegible] O2 3.1% NOX [illegible] CO2 [illegible]
SO2 -1.7PPM THC [illegible] STK TEMP 1429°F MELTEMP 78°F
CO 16.0PPM O2 12.[illegible] NOX 31.6PPM CO2 1.8%
SO2 [illegible] THC 18.[illegible] STK TEMP 1601.0°F CO [illegible]
O2 12.7% NOX 31.6PPM CO2 [illegible] SO2 18.1PPM
THC 18.7PPM STKTEMP 1601.0°F

MANUAL Nov.10.92 08:03
CO 1.7PPM O2 22.8% NOX [illegible] CO2 [illegible]
SO2 -0.7PPM THC [illegible] STK TEMP 1658°F MELTEMP 78°F
CO 14.8PPM O2 13.1% NOX 33.3PPM CO2 1.7%
SO2 19.1PPM THC 20.3PPM STK TEMP 1599.6°F CO 14.8PPM
O2 13.1% NOX 33.3PPM CO2 1.7% SO2 19.1PPM
THC 20.3PPM STKTEMP 1599.6°F

MANUAL Nov.10.92 08:00
CO [illegible] O2 [illegible] NOX [illegible] CO2 *****
SO2 -1.5PPM THC 11.8PPM STK TEMP 1351°F MELTEMP 79°F
CO 16.0PPM O2 12.8% NOX 35.9PPM CO2 [illegible]
SO2 20.8PPM THC 23.1PPM STK TEMP 1600.0°F CO [illegible]
O2 [illegible] NOX [illegible] CO2 [illegible]

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SO2 | -1.6PPM | THC | 11.8PPM | STKTEMP | 1551°F | MELTEMP | 79°F |
| CO | 16.0PPM | O2 | 12.8% | NOX | 35.9PPM | CO2 | 1.7% |
| SO2 | 20.6PPM | THC | 23.1PPM | STKTEMP | 1600.0°F | CO | 16.0PPM |
| O2 | 12.8% | NOX | 35.9PPM | CO2 | 1.7% | SO2 | 20.6PPM |
| THC | 23.1PPM | STKTEMP | 1600.0°F | | | | |

MANUAL Nov.10.92 07:50

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | -0.2PPM | O2 | 0.0% | NOX | 0.2PPM | CO2 | 1.3% |
| SO2 | 88.5PPM | THC | 18.1PPM | STKTEMP | 1564°F | MELTEMP | 80°F |
| CO | 17.4PPM | O2 | 13.7% | NOX | 39.0PPM | CO2 | 1.7% |
| SO2 | 21.0PPM | THC | 25.9PPM | STKTEMP | 1599.5°F | CO | 17.4PPM |
| O2 | 13.7% | NOX | 39.0PPM | CO2 | 1.7% | SO2 | 21.0PPM |
| THC | 25.9PPM | STKTEMP | 1599.5°F | | | | |

SO2 MID

MANUAL Nov.10.92 07:55

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | -0.2PPM | O2 | 0.0% | NOX | 0.3PPM | CO2 | 1.2% |
| SO2 | 231.5PPM | THC | 10.6PPM | STKTEMP | 1369°F | MELTEMP | 80°F |
| CO | [illegible] | O2 | 14.2% | NOX | 40.4PPM | CO2 | 1.7% |
| SO2 | 16.3PPM | THC | 27.3PPM | STKTEMP | 1599.7°F | CO | 17.9PPM |
| O2 | 14.2% | NOX | 40.4PPM | CO2 | 1.7% | SO2 | 16.3PPM |
| THC | 27.3PPM | STKTEMP | 1599.7°F | | | | |

SO2 SPAN

MANUAL Nov.10.92 07:58

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | [illegible] | O2 | 14.5% | NOX | 0.2PPM | CO2 | 1.1% |
| SO2 | -1.0PPM | THC | 30.0PPM | STKTEMP | 1620°F | MELTEMP | 79°F |
| CO | 17.1PPM | O2 | 15.4% | NOX | 45.9PPM | CO2 | 1.7% |
| SO2 | -1.1PPM | THC | 32.9PPM | STKTEMP | 1598.7°F | CO | 17.1PPM |
| O2 | 15.4% | NOX | 45.9PPM | CO2 | 1.7% | SO2 | -1.1PPM |
| THC | 32.9PPM | STKTEMP | 1598.7°F | | | | |

CO MID
SO2 ZERO

MANUAL Nov.10.92 07:18

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 0.0PPM | O2 | 0.0% | NOX | 41.9PPM | CO2 | 1.1% |
| SO2 | -1.7PPM | THC | ****PPM | STKTEMP | [illegible] | MELTEMP | 79°F |
| CO | 16.3PPM | O2 | 15.8% | NOX | 47.4PPM | CO2 | 1.8% |
| SO2 | -1.1PPM | THC | 32.7PPM | STKTEMP | 1597.9°F | CO | 16.3PPM |
| O2 | 15.8% | NOX | 47.4PPM | CO2 | 1.8% | SO2 | -1.1PPM |
| THC | 32.7PPM | STKTEMP | 1597.9°F | | | | |

NOx MID

MANUAL Nov.10.92 07:40

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 0.5PPM | O2 | 0.1% | NOX | [illegible] | CO2 | 1.1% |
| SO2 | -1.7PPM | THC | ****PPM | STKTEMP | [illegible] | MELTEMP | 79°F |
| CO | 17.9PPM | O2 | 17.4% | NOX | 46.3PPM | CO2 | 1.8% |
| SO2 | -1.1PPM | THC | 32.7PPM | STKTEMP | 1599.1°F | CO | 17.9PPM |
| O2 | 17.4% | NOX | 46.3PPM | CO2 | 1.8% | SO2 | -1.1PPM |
| THC | 32.7PPM | STKTEMP | 1599.1°F | | | | |

NOx SPAN
CO ZERO

MANUAL Nov.10.92 08:43

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 96.5PPM | O2 | 0.0% | NOX | 0.0PPM | CO2 | 1.1% |
| SO2 | -2.0PPM | THC | ****PPM | STKTEMP | [illegible] | MELTEMP | 78°F |
| CO | 18.7PPM | O2 | 20.6% | NOX | 40.8PPM | CO2 | 2.0% |
| SO2 | -1.1PPM | THC | 32.7PPM | STKTEMP | 1601.9°F | CO | 18.7PPM |
| O2 | 20.6% | NOX | 40.8PPM | CO2 | 2.0% | SO2 | -1.1PPM |

CO SPAN
NOx ZERO
RACK

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SO2 | -1.1PPM | HC | ****PPM | STKTEMP | [illegible]°F | MELTEMP | 79°F | |
| CO | 17.9PPM | O2 | 17.4% | NOX | 43.3PPM | CO2 | 1.8% | CO ZERO |
| SO2 | -1.1PPM | HC | 32.7PPM | STKTEMP | 1599.1°F | CO | 17.9PPM | |
| O2 | 17.4% | NOX | 46.3PPM | CO2 | 1.8% | SO2 | -1.1PPM | |
| THC | 32.7PPM | STKTEMP | 1599.1°F | | | | | |

MANUAL Nov.10.92 08:43

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CO | 96.5PPM | O2 | 0.0% | NOX | 0.0PPM | CO2 | 1.1% | CO SPAN |
| SO2 | -1.1PPM | THC | ****PPM | STKTEMP | [illegible]°F | MELTEMP | 78°F | NOX ZERO |
| CO | 18.7PPM | O2 | 20.6% | NOX | 40.9PPM | CO2 | 2.0% | |
| SO2 | -1.1PPM | THC | 32.7PPM | STKTEMP | 1601.9°F | CO | 18.7PPM | RACK |
| O2 | 20.6% | NOX | 40.9PPM | CO2 | 2.0% | SO2 | -1.1PPM | |
| THC | 32.7PPM | STKTEMP | 1601.9°F | | | | | |

MANUAL Nov.10.92 08:41

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CO | 96.3PPM | O2 | 22.0% | NOX | 0.1PPM | CO2 | 2.1% | CO SPAN |
| SO2 | -1.7PPM | THC | ****PPM | STKTEMP | 1601°F | MELTEMP | 78°F | NOX ZERO |
| CO | 13.5PPM | O2 | 21.8% | NOX | 44.1PPM | CO2 | 2.0% | ANALYZER |
| SO2 | -1.2PPM | THC | 32.7PPM | STKTEMP | 1604.7°F | CO | 13.5PPM | |
| O2 | 21.8% | NOX | 44.1PPM | CO2 | 2.0% | SO2 | -1.2PPM | |
| THC | 32.7PPM | STKTEMP | 1604.7°F | | | | | |

MANUAL Nov.10.92 08:38

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CO | 0.0PPM | O2 | 22.0% | NOX | 94.0PPM | CO2 | 2.1% | ANALYZER |
| SO2 | -1.7PPM | THC | ****PPM | STKTEMP | 1641°F | MELTEMP | 76°F | NOX ZERO SPAN |
| CO | 7.7PPM | O2 | 21.3% | NOX | 46.7PPM | CO2 | 2.0% | |
| SO2 | -1.2PPM | THC | 32.7PPM | STKTEMP | 1600.7°F | CO | 7.7PPM | CO ZERO |
| O2 | 21.8% | NOX | 46.7PPM | CO2 | 2.0% | SO2 | -1.2PPM | |
| THC | 32.7PPM | STKTEMP | 1600.7°F | | | | | |

MANUAL Nov.10.92 08:35

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| CO | 3.6PPM | O2 | 22.0% | NOX | 94.2PPM | CO2 | 2.2% |
| SO2 | -1.0PPM | THC | ****PPM | STKTEMP | 1651°F | MELTEMP | 76°F |
| CO | 9.1PPM | O2 | 21.3% | NOX | 33.2PPM | CO2 | 2.0% |
| SO2 | -1.3PPM | THC | -3.4PPM | STKTEMP | 1596.5°F | CO | 9.1PPM |
| O2 | 21.0% | NOX | 33.2PPM | CO2 | 2.0% | SO2 | -1.3PPM |
| THC | -3.4PPM | STKTEMP | 1592.5°F | | | | |

10 20 30 40 50 60 70 80 90 100

123 TRC ENVIRONMENTAL CONSULTANTS HUBBER
123 TRC ENVIRONMENTAL CONSULTANTS HUBBER
0314 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
100 CO OXYGEN NOX CO2 SO2 THC STACK MELS
200 PPM PERCENT PPM PERCENT PPM PPM CH3 TEMP TEMP

123 TRC ENVIRONMENTAL CONSULTANTS OLD BETHPAGE LANDFILL
0314 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16
100 CO OXYGEN NOX CO2 SO2 THC STACK MELS
200 PPM PERCENT PPM PERCENT PPM PPM CH3 TEMP TEMP

| | 01 CO PPM | 03 OXYGEN PERCENT | 05 NOX PPM | 07 CO2 PERCENT | 09 SO2 PPM | 11 THC PPM CH3 | 13 STACK TEMP | 15 MELS TEMP |
|---|---|---|---|---|---|---|---|---|
| 08:33:53 | -0.4 | 22.02 | 94.4 | 0.23 | -1.7 | 2.5 | 1626.3F | 74.9F |
| 200 | 0.1 | 22.03 | 94.3 | 0.22 | -2.1 | 2.5 | 1621.8 | 74.2 |
| 300 | 3.1 | 22.03 | 94.4 | 0.22 | -2.0 | 2.5 | 1610.6 | 73.9 |
| 08:36:47 | -0.1 | 22.04 | 94.4 | 0.22 | -1.3 | 2.7 | 1620.9F | 74.9F |
| 200 | 0.1 | 22.03 | 94.2 | 0.22 | -1.8 | 2.5 | 1635.3 | 74.8 |
| 300 | -0.1 | 22.03 | 94.3 | 0.22 | -1.8 | 2.5 | 1637.6 | 74.4 |
| 08:39:34 | 96.4 | 22.05 | 0.1 | 0.22 | -1.0 | 2.5 | 1621.3F | 76.3F |
| 200 | 40.5 | 22.03 | 40.5 | 0.22 | -1.8 | 2.5 | 1635.8 | 74.8 |
| 300 | 28.3 | 22.03 | 56.6 | 0.22 | -1.8 | 2.5 | 1637.9 | 74.6 |
| 08:41:20 | 96.6 | 0.07 | 0.1 | 0.12 | -1.5 | 2.4 | 1585.2F | 76.9F |
| 200 | 91.9 | 0.07 | 0.1 | 0.12 | -1.5 | 2.6 | 1625.9 | 76.0 |
| 300 | 55.8 | 16.57 | 25.3 | 0.19 | -1.8 | 2.5 | 1620.4 | 75.1 |
| 07:46:05 | -0.1 | 0.08 | 94.1 | 0.12 | -1.3 | 2.6 | 1565.9F | 77.3F |
| 200 | 0.4 | 0.08 | 94.2 | 0.11 | -2.4 | 2.4 | 1559.2 | 78.3 |
| 300 | 33.0 | 0.27 | 55.0 | 0.11 | -2.0 | 2.4 | 1577.4 | 77.0 |
| 07:48:50 | 0.0 | 0.10 | 42.9 | 0.12 | -1.3 | 2.4 | 1599.7F | 77.6F |
| 200 | 0.6 | 0.32 | 68.4 | 0.11 | -2.7 | 2.4 | 1574.1 | 77.8 |
| 300 | 0.9 | 0.26 | 74.4 | 0.11 | -2.1 | 2.4 | 1574.2 | 77.8 |
| 07:50:56 | 55.0 | 14.57 | 0.3 | 0.12 | -1.5 | 2.7 | 1609.7F | 77.5F |
| 200 | 54.7 | 14.56 | 2.5 | 0.12 | -1.6 | 2.5 | 1617.6 | 77.6 |
| 300 | 11.3 | 3.79 | 47.0 | 0.12 | -2.0 | 2.4 | 1595.7 | 77.6 |
| 07:55:29 | -2.3 | 0.07 | 0.4 | 0.13 | 232.5 | 5.2 | 1595.9F | 79.2F |
| 200 | 3.1 | 0.06 | 0.4 | 0.13 | 231.6 | 5.0 | 1600.0 | 79.3 |
| 300 | 27.9 | 6.53 | 0.3 | 0.12 | 120.3 | 3.8 | 1610.8 | 78.8 |
| 07:56:48 | -0.3 | 0.09 | 0.2 | 0.13 | 87.2 | 3.7 | 1622.7F | 79.0F |
| 200 | 1.8 | 0.12 | 0.3 | 0.18 | 180.5 | 4.5 | 1593.1 | 79.3 |
| 300 | 13.7 | 2.62 | 0.3 | 0.13 | 165.6 | 4.3 | 1603.6 | 79.3 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| ... | 11.70 | 72.1 | 3.3 | 1596.8 | 78.3 | | |

123 TRC ENVIRONMENTAL CONSULTANTS OLD BETHPAGE LANDFILL

| 0315 / 100 / 200 | 01 CO PPM | 02 | 03 OXYGEN PERCENT | 04 | 05 NOX PPM | 06 | 07 CO2 PERCENT | 08 | 09 SO2 PPM | 10 | 11 THC PPM CH3 | 12 | 13 STACK TEMP | 14 | 15 MELS TEMP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08:03:24 | 1.7 | | 22.81 | | 0.2 | | 3.06 | | -1.7 | | 2.5 | | 1651.5F | | 76.3F |
| 200 | -0.3 | | 15.89 | | 0.2 | | 9.15 | | -1.8 | | 2.4 | | 1590.1 | | 76.4 |
| 300 | -0.4 | | 11.65 | | 0.1 | | 13.41 | | -1.5 | | | | 1588.9 | | 76.9 |
| 08:05:52 | -2.3 | | 3.18 | | 0.2 | | 21.97 | | -3.2 | | 2.5 | | 1596.4F | | 76.3F |
| 200 | -1.1 | | 3.18 | | 0.2 | | 21.97 | | -2.4 | | 2.4 | | 1651.5 | | 76.4 |
| 300 | -0.4 | | 13.11 | | 0.2 | | 12.22 | | -1.9 | | 2.4 | | 1605.6 | | 76.4 |
| 08:14:07 | -2.3 | | 3.19 | | 0.3 | | 22.03 | | -3.2 | | 2.4 | | 1636.8F | | 77.4F |
| 200 | -0.9 | | 3.19 | | 0.2 | | 22.02 | | -2.0 | | 2.4 | | 1614.3 | | 77.4 |
| 300 | -0.9 | | 3.19 | | 0.2 | | 22.01 | | -2.0 | | 2.4 | | 1616.0 | | 77.4 |
| 08:15:19 | 3.8 | | 0.06 | | 87.9 | | 0.19 | | -3.8 | | 2.4 | | 1418.0F | | 77.9F |
| 200 | -0.3 | | 0.06 | | 81.2 | | 0.20 | | -1.5 | | 2.5 | | 1422.4 | | 78.0 |
| 300 | -1.0 | | 2.79 | | 6.7 | | 19.05 | | -2.0 | | 2.4 | | 1577.7 | | 77.4 |
| 08:26:07 | 0.9 | | 0.07 | | 91.7 | | 0.19 | | -3.0 | | 2.7 | | 779.0F | | 78.7F |
| 200 | 1.7 | | 0.06 | | 91.4 | | 0.19 | | -1.0 | | 2.4 | | 784.9 | | 78.9 |
| 300 | 2.4 | | 11.95 | | 33.7 | | 0.30 | | -1.1 | | 2.4 | | 862.4 | | 78.2 |
| 08:31:45 | 96.8 | | 0.06 | | 0.4 | | 0.19 | | -1.0 | | 2.3 | | 726.8F | | 79.5F |
| 200 | 93.1 | | 0.06 | | 0.4 | | 0.19 | | -1.9 | | 2.4 | | 733.8 | | 79.1 |
| 300 | 86.7 | | 0.11 | | 9.6 | | 0.19 | | -1.7 | | 2.4 | | 745.7 | | 78.8 |
| 08:42:38 | 3.0 | | 0.18 | | 0.6 | | 0.18 | | 230.2 | | 5.0 | | 774.6F | | 69.2F |
| 200 | 0.7 | | 0.13 | | 0.6 | | 0.18 | | 222.3 | | 4.9 | | 792.9 | | 73.8 |
| 300 | 1.2 | | 0.16 | | 0.6 | | 0.19 | | 221.8 | | 4.9 | | 785.4 | | 76.1 |
| 08:44:33 | -2.3 | | 3.14 | | 0.5 | | 21.88 | | 8.2 | | 2.5 | | 793.5F | | 74.7F |
| 200 | 0.1 | | 1.20 | | 0.6 | | 5.62 | | 176.1 | | 4.4 | | 790.4 | | 72.5 |
| 300 | 0.5 | | 1.10 | | 0.6 | | 5.07 | | 180.7 | | 4.5 | | 793.9 | | 73.1 |
| 08:45:42 | -1.2 | | 22.26 | | 0.4 | | 3.26 | | 0.7 | | 2.5 | | 901.5F | | 77.2F |
| 200 | -0.4 | | 11.12 | | 0.4 | | 4.17 | | 3.0 | | 2.5 | | 908.2 | | 77.3 |
| 300 | -0.4 | | 3.92 | | 0.6 | | 7.76 | | 130.2 | | 3.9 | | [illegible] | | |
| 09:31:00 | 5.8 | | [illegible] | | [illegible] | | [illegible] | | | | | | | | |
| 200 | [illegible] | | | | | | | | | | | | | | |

DO NOT USE THC

0930 START T-1

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | 10.9 | | 9.43 | | 18.2 | | 10.20 | | 3.2 | | 2.4 | | 1691 | | 76.7 | |
| 300 | 11.5 | | 9.51 | | 18.2 | | 10.15 | | 6.7 | | 2.5 | | 1691.4 | | 76.7 | |

123 TRC ENVIRONMENTAL CONSULTANTS OLD BETHPAGE LANDFILL

| 7315 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | CO | | OXYGEN | | NOX | | CO2 | | SO2 | | THC | | STACK | | METS | |
| 200 | PPM | | PERCENT | | PPM | | PERCENT | | PPM | | PPM CH3 | | TEMP | | TEMP | |
| 09:36:00 | 10.3 | | 9.50 | | 18.3 | | 10.28 | | 1.7 | | 2.5 | | 1670.4F | | 77.5F | |
| 200 | 11.7 | | 9.51 | | 18.2 | | 10.20 | | 1.9 | | 2.4 | | 1683.3 | | 77.6 | |
| 300 | 11.7 | | 9.50 | | 18.2 | | 10.20 | | 1.9 | | 2.4 | | 1683.3 | | 77.6 | |
| 09:41:00 | 15.5 | | 9.38 | | 18.4 | | 10.29 | | -1.3 | | 2.7 | | 1667.9F | | 78.8F | |
| 200 | 11.5 | | 9.44 | | 18.3 | | 10.30 | | 0.4 | | 2.4 | | 1672.0 | | 78.2 | |
| 300 | 11.5 | | 9.44 | | 18.3 | | 10.30 | | 0.5 | | 2.4 | | 1671.9 | | 78.2 | |
| 09:46:00 | 8.2 | | 9.40 | | 18.4 | | 10.30 | | -0.2 | | 2.7 | | 1653.8F | | 78.7F | |
| 200 | 9.5 | | 9.39 | | 18.3 | | 10.29 | | -0.2 | | 2.4 | | 1665.2 | | 78.5 | |
| 300 | 9.5 | | 9.39 | | 18.3 | | 10.29 | | -0.2 | | 2.4 | | 1665.2 | | 78.5 | |
| 09:51:00 | 10.3 | | 9.96 | | 17.5 | | 9.88 | | -2.5 | | 2.4 | | 1637.5F | | 78.5F | |
| 200 | 7.9 | | 9.91 | | 17.5 | | 9.85 | | -0.4 | | 2.3 | | 1640.1 | | 78.7 | |
| 300 | 7.9 | | 9.91 | | 17.5 | | 9.85 | | -0.6 | | 2.3 | | 1640.0 | | 78.7 | |
| 09:56:00 | 1.2 | | 9.41 | | 17.7 | | 10.43 | | -1.7 | | 2.5 | | 1656.6F | | 79.2F | |
| 200 | 5.6 | | 9.86 | | 17.5 | | 9.92 | | -0.8 | | 2.3 | | 1642.0 | | 79.1 | |
| 300 | 5.6 | | 9.87 | | 17.5 | | 9.93 | | -0.9 | | 2.4 | | 1642.0 | | 79.1 | |
| 10:01:00 | 7.3 | | 9.42 | | 18.9 | | 10.38 | | -1.7 | | 2.2 | | 1669.3F | | 80.6F | |
| 200 | 4.5 | | 9.36 | | 18.7 | | 10.41 | | -0.5 | | 2.3 | | 1661.2 | | 79.7 | |
| 300 | 4.5 | | 9.36 | | 18.7 | | 10.40 | | -0.6 | | 2.3 | | 1661.2 | | 79.7 | |
| 10:06:00 | 1.9 | | 9.79 | | 18.0 | | 10.03 | | -0.2 | | 2.5 | | 1652.1F | | 81.1F | |
| 200 | 4.0 | | 9.62 | | 18.4 | | 10.17 | | -0.8 | | 2.3 | | 1664.0 | | 80.6 | |
| 300 | 4.0 | | 9.62 | | 18.4 | | 10.17 | | -0.8 | | 2.3 | | 1663.9 | | 80.6 | |
| 10:11:00 | 6.8 | | 9.89 | | 18.1 | | 10.02 | | -1.5 | | 2.4 | | 1647.0F | | 80.7F | |
| 200 | 3.7 | | 9.82 | | 18.0 | | 10.01 | | -0.9 | | 2.3 | | 1648.2 | | 80.7 | |
| 300 | 3.7 | | 9.82 | | 18.0 | | 10.01 | | -0.8 | | 2.3 | | 1648.1 | | 80.7 | |
| 10:16:00 | 0.1 | | 9.86 | | 18.1 | | 9.97 | | -0.5 | | 2.2 | | 1648.9F | | 81.0F | |
| 200 | 3.4 | | 9.78 | | 18.0 | | 10.06 | | -1.0 | | 2.3 | | 1649.3 | | 81.0 | |
| 300 | 3.4 | | 9.78 | | 18.0 | | 10.05 | | -1.1 | | 2.3 | | 1649.3 | | 81.0 | |

SHORTED + TO ON INPUT TO LOGGER

| | 01 | 03 | 05 | 07 | 09 | 11 | 13 | 15 |
|---|---|---|---|---|---|---|---|---|
| [illegible]:00 | 4.4 | 9.63 | 18.1 | 10.12 | -1.3 | 2.3 | 1649.5F | 83.2F |
| 200 | 3.3 | 9.66 | 17.8 | 9.99 | -1.3 | 2.3 | 1647.0 | 82.1 |
| 300 | 3.3 | 9.66 | 17.8 | 9.99 | -1.3 | 2.3 | 1647.0 | 82.1 |

123 TRC ENVIRONMENTAL CONSULTANTS OLD BETHPAGE LANDFILL

| 3315 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | CO | | OXYGEN | | NOX | | CO2 | | SO2 | | THC | | STACK | | MELS | |
| 200 | PPM | | PERCENT | | PPM | | PERCENT | | PPM | | PPM ~~NH3~~ | | TEMP | | TEMP | |
| 10:26:00 | 0.3 | | 9.81 | | 18.2 | | 10.16 | | -2.7 | | 2.5 | | 1655.7F | | 81.9F | |
| 200 | 3.3 | | 9.82 | | 18.0 | | 10.03 | | -1.7 | | 2.3 | | 1646.8 | | 82.6 | |
| 300 | 3.3 | | 9.82 | | 18.0 | | 10.03 | | -1.7 | | 2.2 | | 1646.8 | | 82.6 | |
| 10:31:00 | 4.2 | | 9.8[illegible] | | 18.4 | | 10.07 | | -2.0 | | 2.6 | | 1646.4F | | 82.7F | |
| 200 | 3.4 | | 9.73 | | 18.2 | | 10.12 | | -1.5 | | 2.3 | | 1648.5 | | 83.0 | |
| 300 | 3.4 | | 9.7[illegible] | | 18.2 | | 10.12 | | -1.5 | | 2.3 | | 1648.5 | | 83.0 | |
| 10:36:00 | -2.3 | | 9.79 | | 18.2 | | 10.11 | | -1.7 | | 2.2 | | 1670.8F | | 85.0F | |
| 200 | 3.3 | | 9.76 | | 18.2 | | 10.09 | | -2.2 | | 2.2 | | 1659.0 | | 83.2 | |
| 300 | 3.3 | | 9.76 | | 18.2 | | 10.09 | | -2.1 | | 2.2 | | 1658.8 | | 83.2 | |
| 10:41:00 | -0.6 | | 9.79 | | 18.3 | | 10.07 | | -3.8 | | 0.8 | | 1690.8F | | 84.1F | |
| 200 | | | | | 18.2 | | 10.10 | | -2.3 | | 0.9 | | 1681.2 | | 83.8 | |
| 300 | 3.3 | | 9.76 | | 18.2 | | 10.10 | | -2.3 | | 0.9 | | 1681.2 | | 83.8 | |
| 10:46:00 | 6.0 | | 9.79 | | 18.1 | | 10.13 | | -1.5 | | 0.0 | | 1689.0F | | 83.1F | |
| 200 | 3.1 | | 9.75 | | 18.2 | | 10.13 | | -2.2 | | 0.0 | | 1688.3 | | 83.5 | |
| 300 | 3.1 | | 9.75 | | 18.2 | | 10.12 | | -2.2 | | 0.0 | | 1688.4 | | 83.5 | |
| 10:51:00 | 7.1 | | 9.73 | | 18.2 | | 10.17 | | -3.2 | | 0.0 | | 1697.3F | | 83.3F | |
| 200 | 3.3 | | 9.75 | | 18.1 | | 10.12 | | -2.5 | | 0.0 | | 1692.9 | | 82.9 | |
| 300 | 3.3 | | 9.75 | | 18.1 | | 10.12 | | -2.5 | | 0.0 | | 1692.9 | | 82.9 | |
| 10:56:00 | 8.3 | | 9.31 | | 18.1 | | 10.01 | | -4.7 | | 0.0 | | 1681.2F | | 84.3F | |
| 200 | 3.3 | | 9.73 | | 18.2 | | 10.14 | | -3.4 | | 0.0 | | 1692.4 | | 83.8 | |
| 300 | 3.3 | | 9.72 | | 18.2 | | 10.14 | | -3.4 | | 0.0 | | 1692.5 | | 83.8 | |
| 11:01:00 | 4.4 | | 9.89 | | 18.0 | | 10.01 | | -2.7 | | 0.0 | | 1681.8F | | 84.0F | |
| 200 | -3.2 | | 9.81 | | 18.0 | | 10.06 | | -3.1 | | 0.0 | | 1682.9 | | 83.8 | |
| 300 | 3.2 | | 9.81 | | 18.0 | | 10.06 | | -3.1 | | 0.0 | | 1682.9 | | 83.8 | |
| 11:06:00 | 3.7 | | 9.93 | | 18.0 | | 9.98 | | -3.0 | | 0.0 | | 1679.9F | | 85.9F | |
| 200 | 3.5 | | [illegible] | | [illegible] | | [illegible].03 | | 3.3 | | 0.0 | | 1683.1 | | 85.1 | |
| 300 | 3.5 | | 9.[illegible]6 | | [illegible] | | [illegible].03 | | [illegible] | | [illegible] | | [illegible] | | [illegible] | |

| 123 | TRC ENVIRONMENTAL CONSULTANTS | | | | OLD BETHPAGE LANDFILL | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1315 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 |
| 100 | CO | | OXYGEN | | NOX | | CO2 | | SO2 | | THC | | STACK | | MELS |
| 200 | PPM | | PERCENT | | PPM | | PERCENT | | PPM | | PPM CH3 | | TEMP | | TEMP |
| 11:11:00 | [illegible] | | [illegible] | | 18.1 | | [illegible] | | [illegible] | | [illegible] | | [illegible] | | [illegible] |
| 200 | [illegible] | | .85 | | 17. | | 10. | | | | .0 | | .5 | | 85. |
| 300 | 3.6 | | 9.85 | | 17.9 | | 10.04 | | -3.5 | | 0.0 | | 1680.4 | | 85.0 |
| 11:16:00 | 5.3 | | 9.89 | | 17.9 | | 9.98 | | -5.2 | | 0.0 | | 1683.9F | | 85.5F |
| 200 | 3.1 | | 9.88 | | 17.9 | | 10.02 | | -3.6 | | 0.0 | | 1678.5 | | 85.2 |
| 300 | 3.1 | | 9.88 | | 17.9 | | 10.01 | | -3.6 | | 0.0 | | 1678.4 | | 85.2 |
| 11:21:00 | 5.4 | | 9.81 | | 18.1 | | 10.12 | | -4.0 | | 0.0 | | 1699.7F | | 87.5F |
| 200 | 3.6 | | 9.83 | | 18.0 | | 10.06 | | -3.7 | | 0.0 | | 1691.3 | | 85.7 |
| 300 | 3.6 | | 9.83 | | 18.0 | | 10.06 | | -3.7 | | 0.0 | | 1691.5 | | 85.7 |
| 11:26:00 | 4.9 | | 9.46 | | 19.1 | | 10.45 | | -3.0 | | 0.0 | | 1709.7F | | 87.1F |
| 200 | 3.6 | | 9.63 | | 18.4 | | 10.24 | | -3.7 | | 0.0 | | 1701.5 | | 86.9 |
| 300 | 3.6 | | 9.63 | | 18.4 | | 10.24 | | -3.8 | | 0.0 | | 1701.5 | | 86.9 |
| 11:31:00 | 2.8 | | 9.74 | | 19.0 | | 10.06 | | -3.2 | | 0.0 | | 1689.6F | | 87.4F |
| 200 | 3.9 | | 9.55 | | 18.8 | | 10.29 | | -3.6 | | 0.0 | | 1700.0 | | 87.2 |
| 300 | 3.9 | | 9.55 | | 18.8 | | 10.29 | | -3.5 | | 0.0 | | 1700.0 | | 87.2 |
| 11:36:00 | 4.9 | | 9.90 | | 18.2 | | 9.99 | | -3.2 | | 0.0 | | 1694.1F | | 82.2F |
| 200 | 3.0 | | 9.93 | | 18.2 | | 9.95 | | -3.5 | | 0.0 | | 1683.8 | | 83.7 |
| 300 | 3.0 | | 9.93 | | 18.2 | | 9.95 | | -3.6 | | 0.0 | | 1683.8 | | 83.8 |
| 11:49:37 | -2.3 | | 0.17 | | 90.1 | | 0.25 | | -6.0 | | 0.0 | | 1679.6F | | 72.3F |
| 200 | 0.4 | | 0.14 | | 90.1 | | 0.25 | | -6.1 | | 0.0 | | 1681.2 | | 72.9 |
| 300 | 0.7 | | 0.14 | | 90.1 | | 0.26 | | -6.0 | | 0.0 | | 1683.0 | | 72.5 |
| 11:52:10 | 1.5 | | 0.17 | | 90.1 | | 0.25 | | -7.0 | | 0.0 | | 1679.2F | | 68.8F |
| 200 | 0.1 | | 0.17 | | 90.1 | | 0.25 | | -7.3 | | 0.0 | | 1675.0 | | 69.5 |
| 300 | 0.4 | | 0.16 | | 90.0 | | 0.25 | | -6.8 | | 0.0 | | 1678.4 | | 71.9 |
| 11:52:45 | 0.6 | | 0.18 | | 90.3 | | 0.24 | | -7.5 | | 0.0 | | 1677.5F | | 67.5F |
| 200 | -0.6 | | 0.17 | | 90.1 | | 0.24 | | -7.4 | | 0.0 | | 1675.3 | | 68.9 |
| 300 | 0.0 | | 0.16 | | 90.0 | | 0.25 | | -6.9 | | 0.0 | | 1678.0 | | 71.3 |
| 11:58:58 | 91.7 | | 0.13 | | 0.4 | | 0.24 | | -7.7 | | 0.0 | | 1680.6F | | 67.3F |
| 200 | 87.5 | | 0.12 | | 0.4 | | 0.23 | | -8.2 | | 0.0 | | 1683.4 | | 68.4 |
| 300 | 87.9 | | 0.12 | | 1.4 | | 0.23 | | -8.5 | | 0.0 | | 1682.7 | | [illegible] |

1130 END TEST # 1

123 TRC ENVIRONMENTAL CONSULTANTS OLD BETHPAGE LANDFILL

| 1315 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | CO | | OXYGEN | | NOX | | CO2 | | SO2 | | THC | | STACK | | MELS | |
| 200 | PPM | | PERCENT | | PPM | | PERCENT | | PPM | | PPM CH3 | | TEMP | | TEMP | |
| 12:10:01 | 1.1 | | 0.24 | | 0.3 | | 0.23 | | 227.0 | | 0.0 | | 1662.3F | | 75.9F | |
| 200 | 0.5 | | 0.24 | | 0.3 | | 0.23 | | 224.7 | | 0.0 | | 1667.1 | | 76.2 | |
| 300 | 0.3 | | 0.24 | | 0.3 | | 0.23 | | 222.6 | | 0.0 | | 1668.5 | | 76.0 | |
| 12:13:40 | 4.4 | | 3.10 | | 0.1 | | 21.95 | | 0.2 | | 0.0 | | 1704.8F | | 77.2F | |
| 200 | 0.1 | | 3.13 | | 0.1 | | 21.97 | | -1.2 | | 0.0 | | 1693.1 | | 76.5 | |
| 300 | 0.4 | | 2.00 | | 0.2 | | 13.57 | | 92.2 | | 0.0 | | 1677.8 | | 76.3 | |
| 12:17:48 | -0.1 | | 22.71 | | 0.1 | | 3.12 | | 0.2 | | 0.0 | | 1697.0F | | 74.7F | |
| 200 | 4.0 | | 22.6 | | 0.1 | | 3.15 | | -0.3 | | 0.0 | | 1698.1 | | 74.7 | |
| 300 | 2.5 | | 16.31 | | 0.1 | | 8.86 | | -0.4 | | 0.0 | | 1702.7 | | 76.3 | |
| 12:26:46<br>200 | 95.7<br>97.9 | | 0.1<br>0.12 | | 0.2<br>0.2 | | 0.23<br>0.23 | | 1.3<br>0.7 | | 0.0<br>0.0 | | 1665.9F<br>1665.0 | | 77.2F<br>77.1 | |
| 300 | 97.2 | | 0.11 | | 0.2 | | 0.23 | | 0.6 | | 0.0 | | 1683.6 | | 76.3 | |
| 12:29:14 | 9.0 | | 10.30 | | 16.8 | | 9.42 | | 0.0 | | 0.0 | | 1655.4F | | 77.9F | |
| 200 | 43.0 | | 6.79 | | 8.7 | | 6.46 | | 1.7 | | 0.0 | | 1659.7 | | 77.5 | |
| 300 | 62.7 | | 4.34 | | 5.6 | | 4.17 | | 1.4 | | 0.0 | | 1669.5 | | 76.7 | |
| 12:30:00 | 3.5 | | 10.30 | | 17.0 | | 9.54 | | 2.2 | | 0.0 | | 1655.2F | | 77.7F | |
| 200 | 34.9 | | 7.53 | | 10.4 | | 7.10 | | 1.7 | | 0.0 | | 1659.2 | | 77.6 | |
| 300 | 44.2 | | 6.38 | | 8.9 | | 6.03 | | 1.5 | | 0.0 | | 1663.3 | | 77.4 | |
| 12:35:00 | 6.1 | | 9.36 | | 18.3 | | 10.13 | | 2.2 | | 0.0 | | 1677.0F | | 77.9F | |
| 200 | 4.2 | | 10.37 | | 17.3 | | 9.75 | | 1.8 | | 0.0 | | 1661.5 | | 77.6 | |
| 300 | 4.2 | | 10.07 | | 17.3 | | 9.75 | | 1.9 | | 0.0 | | 1661.4 | | 77.6 | |
| 13:18:27 | 4.8 | | 0.13 | | 93.0 | | 0.24 | | 2.0 | | 0.0 | | 1672.8F | | 73.5F | |
| 200 | -7.5 | | 3.46 | | 59.5 | | 3.13 | | 3.5 | | 0.0 | | 1669.6 | | 73.9 | |
| 300 | 6.2 | | 8.41 | | 39.9 | | 3.08 | | 6.1 | | 0.0 | | 1671.0 | | 73.5 | |
| 13:21:00 | 11.3 | | 9.53 | | 18.3 | | 10.12 | | 3.0 | | 0.0 | | 1686.7F | | 72.7F | |
| 200 | 7.9 | | 9.58 | | 18.4 | | 10.07 | | 2.1 | | 0.0 | | 1686.5 | | 72.3 | |
| 300 | 8.0 | | 4.35 | | 61.7 | | 4.74 | | 2.0 | | 0.0 | | 1676.0 | | 72.9 | |

123 TRC ENVIRONMENTAL CONSULTANTS OLD BETHPAGE LANDFILL

| 0315 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | CO | | OXYGEN | | NOX | | CO2 | | SO2 | | THC | | STACK | | MELS | |
| 200 | PPM | | PERCENT | | PPM | | PERCENT | | PPM | | PPM CH3 | | TEMP | | TEMP | |
| 13:26:00 | 4.9 | | 9.73 | | 18.2 | | 9.90 | | 0.5 | | 0.0 | | 1680.5F | | 74.8F | |
| 200 | 8.1 | | 9.64 | | 18.0 | | 10.00 | | 1.8 | | 0.0 | | 1681.3 | | 74.5 | |
| 300 | 8.1 | | 9.64 | | 18.0 | | 10.00 | | 1.9 | | 0.0 | | 1681.4 | | 74.5 | |
| 13:31:00 | 10.7 | | 9.91 | | 18.2 | | 9.92 | | 2.2 | | 0.0 | | 1670.6F | | 71.9F | |
| 200 | 6.9 | | 9.76 | | 18.0 | | 9.99 | | 1.9 | | 0.0 | | 1672.9 | | 74.6 | |
| 300 | 6.9 | | 9.76 | | 18.0 | | 9.99 | | 1.9 | | 0.0 | | 1672.7 | | 74.7 | |
| 13:36:00 | -0.1 | | 9.87 | | 18.2 | | 9.95 | | 2.0 | | 0.0 | | 1670.9F | | 74.1F | |
| 200 | 5.1 | | 9.81 | | 17.9 | | 9.95 | | 1.3 | | 0.0 | | 1671.0 | | 72.9 | |
| 300 | 5.1 | | 9.81 | | 17.9 | | 9.95 | | 1.4 | | 0.0 | | 1671.0 | | 72.9 | |
| 13:41:00 | 4.7 | | 10.12 | | 17.8 | | 9.59 | | 1.0 | | 0.0 | | 1650.3F | | 76.7F | |
| 200 | 5.2 | | 9.92 | | 17.8 | | 9.87 | | 1.4 | | 0.0 | | 1662.7 | | 76.4 | |
| 300 | 5.2 | | 9.92 | | 17.8 | | 9.87 | | 1.4 | | 0.0 | | 1662.7 | | 76.4 | |
| 13:46:00 | 8.3 | | 10.15 | | 17.0 | | 9.59 | | 2.0 | | 0.0 | | 1644.2F | | 73.5F | |
| 200 | 5.5 | | 10.27 | | 17.0 | | 9.55 | | 1.6 | | 0.0 | | 1645.8 | | 75.9 | |
| 300 | 5.5 | | 10.27 | | 17.0 | | 9.55 | | 1.6 | | 0.0 | | 1645.9 | | 75.9 | |
| 13:51:00 | 6.5 | | 9.81 | | 18.1 | | 10.00 | | 2.5 | | 0.0 | | 1663.2F | | 76.3F | |
| 200 | 4.6 | | 9.88 | | 17.6 | | 9.92 | | 1.6 | | 0.0 | | 1662.5 | | 74.5 | |
| 300 | 4.6 | | 9.88 | | 17.6 | | 9.92 | | 1.7 | | 0.0 | | 1662.5 | | 74.5 | |
| 13:56:00 | 6.8 | | 9.99 | | 17.8 | | 9.91 | | 2.2 | | 0.0 | | 1657.2F | | 75.8F | |
| 200 | 3.9 | | 9.81 | | 17.9 | | 9.98 | | 1.9 | | 0.0 | | 1665.9 | | 74.4 | |
| 300 | 3.9 | | 9.81 | | 17.9 | | 9.98 | | 1.8 | | 0.0 | | 1665.9 | | 74.4 | |
| 14:01:00 — | 2.1 | | 9.83 | | 17.7 | | 9.90 | | 2.2 | | 0.0 | | 1661.9F | | 74.7F | |
| 200 | 4.0 | | 9.85 | | 17.8 | | 9.94 | | 1.6 | | 0.0 | | 1660.1 | | 75.1 | |
| 300 | 4.0 | | 9.85 | | 17.8 | | 9.94 | | 1.6 | | 0.0 | | 1660.2 | | 75.1 | |
| 14:06:00 | 6.9 | | 9.85 | | 17.5 | | 10.02 | | 2.0 | | 0.0 | | 1652.4F | | 75.5F | |
| 200 | 4.2 | | 9.95 | | 17.6 | | 9.85 | | 1.8 | | 0.0 | | 1648.8 | | 76.1 | |
| 300 | 4.2 | | 9.95 | | 17.6 | | 9.85 | | 1.7 | | 0.0 | | 1648.8 | | 76.1 | |
| 14:11:00 | 8.9 | | 10.08 | | 17.0 | | 9.85 | | 2.5 | | 0.0 | | 1647.3F | | 78.2F | |
| 200 | 3.7 | | 9.98 | | 17.4 | | 9.82 | | 1.6 | | 0.0 | | 1651.3F | | 75.5F | |
| 300 | 3.7 | | 9.98 | | 17.4 | | 9.82 | | 1.7 | | 0.0 | | 1651.3 | | 75.5 | |

TRC ENVIRONMENTAL CONSULTANTS OLD BETHPAGE LANDFILL

| 5 | 01 CO PPM | 02 | 03 OXYGEN PERCENT | 04 | 05 NOX PPM | 06 | 07 CO2 PERCENT | 08 | 09 SO2 PPM | 10 | 11 THC PPM CH3 | 12 | 13 STACK TEMP | 14 | 15 MELS TEMP | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16:00 | -1.7 | | 9.58 | | 18.3 | | 10.12 | | 1.3 | | 0.0 | | 1666.7F | | 75.1F | |
| | 3.7 | | 9.66 | | 17.8 | | 10.13 | | 1.3 | | 0.0 | | 1663.7 | | 75.6 | |
| | 3.7 | | 9.66 | | 17.8 | | 10.13 | | 1.3 | | 0.0 | | 1663.8 | | 75.6 | |
| 21:00 | 3.4 | | 9.68 | | 18.1 | | 10.12 | | 0.7 | | 0.0 | | 1667.7F | | 77.8F | |
| | 3.6 | | 9.64 | | 18.0 | | 10.14 | | 1.4 | | 0.0 | | 1666.8 | | 77.3 | |
| | 3.6 | | 9.64 | | 18.0 | | 10.14 | | 1.4 | | 0.0 | | 1666.8 | | 77.3 | |
| 26:00 | 1.7 | | 9.68 | | 17.9 | | 10.20 | | 2.2 | | 0.0 | | 1669.9F | | 76.5F | |
| | 4.1 | | 9.67 | | 18.0 | | 10.12 | | 1.5 | | 0.0 | | 1669.5 | | 76.8 | |
| | 4.1 | | 9.67 | | 18.0 | | 10.12 | | 1.6 | | 0.0 | | 1669.4 | | 76.8 | |
| 31:00 | 3.8 | | 10.04 | | 17.1 | | 9.71 | | 0.5 | | 0.0 | | 1663.8F | | 77.7F | |
| | 4.5 | | 9.81 | | 17.8 | | 9.98 | | 1.9 | | 0.0 | | 1674.5 | | 77.1 | |
| | 4.5 | | 9.81 | | 17.8 | | 9.98 | | 1.9 | | 0.0 | | 1674.6 | | 77.1 | |
| 36:00 | 3.0 | | 9.95 | | 17.1 | | 9.77 | | 0.5 | | 0.0 | | 1669.1F | | 77.2F | |
| | 4.7 | | 10.09 | | 17.2 | | 9.74 | | 2.5 | | 0.0 | | 1668.0 | | 76.9 | |
| | 4.7 | | 10.09 | | 17.2 | | 9.74 | | 2.5 | | 0.0 | | 1667.9 | | 76.9 | |
| 41:00 | 2.1 | | 9.63 | | 18.0 | | 10.25 | | 3.2 | | 0.0 | | 1683.9F | | 77.9F | |
| | 4.3 | | 9.80 | | 17.6 | | 10.02 | | 2.4 | | 0.0 | | 1683.1 | | 78.1 | |
| | 4.3 | | 9.80 | | 17.6 | | 10.02 | | 2.5 | | 0.0 | | 1683.1 | | 78.1 | |
| :46:00 | 6.3 | | 9.75 | | 18.4 | | 10.01 | | 2.7 | | 0.0 | | 1696.3F | | 77.0F | |
| 0 | 4.4 | | 9.61 | | 18.4 | | 10.20 | | 2.2 | | 0.0 | | 1695.3 | | 77.3 | |
| 0 | 4.4 | | 9.61 | | 18.4 | | 10.20 | | 2.3 | | 0.0 | | 1695.4 | | 77.3 | |
| :51:00 | -0.7 | | 9.89 | | 18.0 | | 10.09 | | 0.7 | | 0.0 | | 1694.7F | | 76.7F | |
| 1 | 4.1 | | 9.82 | | 18.1 | | 10.01 | | 2.3 | | 0.0 | | 1693.0 | | 77.5 | |
| 0 | 4.1 | | 9.81 | | 18.1 | | 10.01 | | 2.3 | | 0.0 | | 1693.1 | | 77.5 | |
| :56:00 | 6.7 | | 10.24 | | 17.8 | | 9.63 | | 2.5 | | 0.0 | | 1681.8F | | 78.4F | |
| 0 | 4.3 | | 9.80 | | 18.1 | | 10.01 | | 2.1 | | 0.0 | | 1697.9 | | 77.5 | |
| 0 | 4.3 | | 9.80 | | 18.1 | | 10.01 | | 2.1 | | 0.0 | | 1697.8 | | 77.5 | |
| :01:00 | 0.2 | | 10.13 | | 17.3 | | 9.70 | | 0.5 | | 0.0 | | 1685.9F | | 78.8F | |
| 10 | 4.2 | | 10.21 | | 17.2 | | 9.65 | | 2.0 | | 0.0 | | 1680.2 | | 77.9 | |
| 30 | 4.2 | | 10.21 | | 17.2 | | 9.65 | | 2.0 | | 0.0 | | 1680.2 | | 78.0 | |

123 TRC ENVIRONMENTAL CONSULTANTS OLD BETHPAGE LANDFILL

| 123 0315 100 200 | 01 CO PPM | 02 | 03 OXYGEN PERCENT | 04 | 05 NOX PPM | 06 | 07 CO2 PERCENT | 08 | 09 SO2 PPM | 10 | 11 THC PPM CH3 | 12 | 13 STACK TEMP | 14 | 15 METS TEMP | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15:06:00 | 0.4 | | 9.71 | | 18.4 | | 10.18 | | 1.7 | | 0.0 | | 1703.1F | | 78.7F | |
| 200 | 4.3 | | 9.92 | | 17.7 | | 9.94 | | 2.1 | | 0.0 | | 1691.1 | | 78.3 | |
| 300 | 4.3 | | 9.92 | | 17.7 | | 9.94 | | 2.1 | | 0.0 | | 1691.0 | | 78.3 | |
| 15:11:00 | 1.7 | | 9.72 | | 18.4 | | 10.17 | | 2.5 | | 0.0 | | 1707.0F | | 79.0F | |
| 200 | 4.1 | | 9.66 | | 18.5 | | 10.17 | | 1.8 | | 0.0 | | 1709.1 | | 78.8 | |
| 300 | 4.1 | | 9.66 | | 18.5 | | 10.17 | | 1.8 | | 0.0 | | 1709.1 | | 78.8 | |
| 15:16:00 | 7.1 | | 9.91 | | 17.7 | | 9.90 | | 2.5 | | 0.0 | | 1698.5F | | 78.2F | |
| 200 | 4.4 | | 9.96 | | 17.9 | | 9.92 | | 1.9 | | 0.0 | | 1699.3 | | 77.4 | |
| 300 | 4.4 | | 9.96 | | 17.9 | | 9.92 | | 1.9 | | 0.0 | | 1699.3 | | 77.4 | |
| 15:21:00 | 0.7 | | 9.95 | | 17.9 | | 9.89 | | 2.0 | | 0.0 | | 1693.7F | | 74.9F | |
| 200 | 4.3 | | 9.90 | | 17.7 | | 9.96 | | 1.6 | | 0.0 | | 1696.0 | | 74.8 | |
| 300 | 4.3 | | 9.90 | | 17.7 | | 9.96 | | 1.6 | | 0.0 | | 1696.0 | | 74.8 | |
| 15:26:00 | -0.3 | | 9.80 | | 17.9 | | 10.02 | | 2.0 | | 0.0 | | 1699.2F | | 77.9F | |
| 200 | 3.9 | | 9.89 | | 17.8 | | 9.96 | | 1.7 | | 0.0 | | 1692.4 | | 76.7 | |
| 300 | 3.9 | | 9.89 | | 17.8 | | 9.96 | | 1.7 | | 0.0 | | 1692.3 | | 76.7 | |
| 15:27:38 | 8.6 | | 10.01 | | 17.8 | | 9.85 | | 2.2 | | 0.0 | | 1686.4F | | 74.3F | |
| 200 | 4.8 | | 9.82 | | 17.9 | | 10.00 | | 1.8 | | 0.0 | | 1696.3 | | 76.4 | |
| 300 | 4.0 | | 9.87 | | 17.8 | | 9.97 | | 1.7 | | 0.0 | | 1694.1 | | 77.0 | |
| 15:30:48 | 1.1 | | 0.15 | | 92.4 | | 0.37 | | 2.0 | | 0.0 | | 1718.6F | | 76.0F | |
| 200 | 4.8 | | [illegible] | | 43.7 | | 5.94 | | 0.5 | | 0.0 | | 1701.6 | | 76.5 | |
| 300 | 4.5 | | 6.06 | | 42.0 | | 6.12 | | 0.7 | | 0.0 | | 1701.3 | | 76.6 | |
| 15:33:37 | 95.0 | | 0.15 | | 0.6 | | 0.29 | | -0.5 | | 0.0 | | 1716.9F | | 78.1F | |
| 200 | [illegible] | | 0.17 | | [illegible] | | 0.29 | | 0.2 | | 0.0 | | 1718.7 | | 77.4 | |
| 300 | 40.4 | | 0.56 | | 52.3 | | 0.64 | | 0.1 | | 0.0 | | 1715.3 | | 77.2 | |
| 15:42:35 | 3.5 | | 0.16 | | 0.6 | | 0.28 | | 228.2 | | 0.0 | | 1687.2F | | 78.1F | |
| 200 | 5.6 | | 0.16 | | 0.5 | | 0.28 | | 227.0 | | 0.0 | | 1686.0 | | 76.8 | |
| 300 | 5.2 | | 0.16 | | 0.6 | | 0.28 | | 224.9 | | 0.0 | | 1685.2 | | 77.2 | |
| 15:44:53 | -0.1 | | 3.21 | | 0.4 | | 21.98 | | 6.0 | | 0.0 | | 1691.4F | | 77.5F | |
| 200 | 3.9 | | 1.55 | | 0.5 | | [illegible] | | 134.7 | | 0.0 | | 1686.4 | | 76.9 | |
| 300 | 4.3 | | 1.23 | | 0.5 | | 8.14 | | 155.5 | | 0.0 | | 1686.2 | | 77.0 | |

3 TRC ENVIRONMENTAL CONSULTANTS OLD BETHPAGE LANDFILL

| 315 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10<br>00 | CO<br>PPM | | OXYGEN<br>PERCENT | | NOX<br>PPM | | CO2<br>PERCENT | | SO2<br>PPM | | THC<br>PPM CH3 | | STACK<br>TEMP | | MELS<br>TEMP | |
| 5:46:10 | 3.5 | | 22.41 | | 0.4 | | 3.27 | | 4.0 | | 0.0 | | 1688.3F | | 77.2F | |
| 00 | 3.5 | | 22.41 | | 0.4 | | 3.28 | | 4.0 | | 0.0 | | 1685.4 | | 77.2 | |
| 10 | 3.0 | | 4.87 | | 0.4 | | 10.86 | | 96.4 | | 0.0 | | 1686.9 | | 77.0 | |
| 5:48:08 | 4.1 | | 9.86 | | 18.1 | | 10.04 | | 3.5 | | 0.0 | | 1696.0F | | 76.0F | |
| 30 | 3.2 | | 13.22 | | 9.4 | | 8.47 | | 3.0 | | 0.0 | | 1693.7 | | 77.0 | |
| 00 | 2.2 | | 9.36 | | 4.0 | | 14.02 | | 14.3 | | 0.0 | | 1689.5 | | 77.0 | |
| 5:52:51 | -0.6 | | 9.93 | | 18.4 | | 9.93 | | 1.5 | | 0.0 | | 1691.6F | | 71.4F | |
| 00 | 2.1 | | 9.88 | | 18.2 | | 9.99 | | 1.9 | | 0.0 | | 1692.4 | | 72.4 | |
| 00 | 2.3 | | 9.88 | | 18.1 | | 9.99 | | 2.0 | | 0.0 | | 1692.6 | | 73.2 | |
| 5:58:00 | 4.4 | | 9.73 | | 18.1 | | 10.06 | | 1.3 | | 0.0 | | 1703.8F | | 77.6F | |
| 00 | 2.2 | | 9.80 | | 18.1 | | 10.03 | | 0.6 | | 0.0 | | 1698.9 | | 75.8 | |
| 00 | 2.2 | | 9.80 | | 18.1 | | 10.03 | | 0.6 | | 0.0 | | 1698.9 | | 75.8 | |
| 6:03:00 | 1.8 | | 9.78 | | 18.6 | | 10.08 | | 0.5 | | 0.0 | | 1711.8F | | 78.3F | |
| 200 | 2.6 | | 9.70 | | 18.4 | | 10.13 | | 0.7 | | 0.0 | | 1708.3 | | 77.7 | |
| 300 | 2.6 | | 9.70 | | 18.4 | | 10.13 | | 0.7 | | 0.0 | | 1708.4 | | 77.7 | |
| 16:08:00 | 3.1 | | 9.58 | | 19.0 | | 10.33 | | 1.5 | | 0.0 | | 1711.4F | | 76.6F | |
| 200 | 3.5 | | 9.57 | | 18.9 | | 10.25 | | 1.3 | | 0.0 | | 1715.6 | | 77.2 | |
| 300 | 3.5 | | 9.57 | | 18.9 | | 10.25 | | 1.3 | | 0.0 | | 1715.6 | | 77.2 | |
| 16:13:00 | -1.8 | | 10.10 | | 18.0 | | 9.95 | | 2.0 | | 0.0 | | 1688.4F | | 76.3F | |
| 200 | 3.1 | | 9.36 | | 18.2 | | 9.91 | | 1.2 | | 0.0 | | 1697.6 | | 76.4 | |
| 300 | 3.1 | | 9.36 | | 18.2 | | 9.91 | | 1.2 | | 0.0 | | 1697.7 | | 76.4 | |
| 16:18:00 | 4.3 | | 10.01 | | 18.1 | | 9.85 | | 2.5 | | 0.0 | | 1674.2F | | 77.5F | |
| 200 | 3.6 | | 9.97 | | 18.0 | | 9.88 | | 1.5 | | 0.0 | | 1685.2 | | 77.4 | |
| 300 | 3.6 | | 9.97 | | 18.0 | | 9.89 | | 1.5 | | 0.0 | | 1685.3 | | 77.4 | |
| 16:23:00 | 5.7 | | 10.15 | | 17.7 | | 9.74 | | 2.5 | | 0.0 | | 1677.8F | | 77.9F | |
| 200 | 3.9 | | 10.15 | | 17.6 | | 9.73 | | 1.8 | | 0.0 | | 1676.8 | | 78.1 | |
| 300 | 3.9 | | 10.15 | | 17.6 | | 9.73 | | 1.8 | | 0.0 | | 1676.7 | | 78.1 | |
| 16:28:00 | 2.9 | | 10.07 | | 17.6 | | 9.70 | | 2.5 | | 0.0 | | 1673.3F | | 77.3F | |
| 200 | 3.3 | | 10.20 | | 17.5 | | 9.68 | | 1.9 | | 0.0 | | 1676.8 | | 77.7 | |
| 300 | 3.3 | | 10.20 | | 17.5 | | 9.68 | | 1.8 | | 0.0 | | 1676.8 | | 77.7 | |

123 TRC ENVIRONMENTAL CONSULTANTS OLD BETHPAGE LANDFILL

| 0315<br>100<br>200 | 01<br>CO<br>PPM | 02 | 03<br>OXYGEN<br>PERCENT | 04 | 05<br>NOX<br>PPM | 06 | 07<br>CO2<br>PERCENT | 08 | 09<br>SO2<br>PPM | 10 | 11<br>THC<br>PPM CH3 | 12 | 13<br>STACK<br>TEMP | 14 | 15<br>MELS<br>TEMP | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16:47:41 | 5.4 | | 0.16 | | 91.5 | | 0.34 | | 1.7 | | 0.0 | | 1658.4F | | 75.2F | |
| 200 | 3.9 | | 11.92 | | 27.0 | | 2.68 | | 4.9 | | 0.0 | | 1667.8 | | 76.4 | |
| 300 | 3.9 | | 11.96 | | 26.5 | | 2.87 | | 4.7 | | 0.0 | | 1668.1 | | 76.4 | |
| 16:52:13 | 6.6 | | 10.05 | | 17.4 | | 9.77 | | 0.5 | | 0.0 | | 1640.6F | | 73.0F | |
| 200 | 1.2 | | 10.42 | | 32.1 | | 8.90 | | 0.3 | | 0.0 | | 1644.9 | | 69.9 | |
| 300 | 1.7 | | 8.70 | | 41.9 | | 7.47 | | 0.4 | | 0.0 | | 1647.4 | | 70.8 | |
| 16:53:00 | 3.6 | | 10.26 | | 17.4 | | 9.67 | | -1.7 | | 0.0 | | 1641.0F | | 74.6F | |
| 200 | 1.4 | | 10.37 | | 29.6 | | 9.04 | | 0.1 | | 0.0 | | 1644.1 | | 70.5 | |
| 300 | 1.4 | | 10.03 | | 27.3 | | 9.35 | | 0.2 | | 0.0 | | 1643.7 | | 70.5 | |
| 16:58:00 | 0.4 | | 10.12 | | 17.3 | | 9.65 | | -2.0 | | 0.0 | | 1634.6F | | 71.3F | |
| 200 | 3.4 | | 10.17 | | 17.3 | | 9.64 | | -0.5 | | 0.0 | | 1637.3 | | 74.4 | |
| 300 | 3.4 | | 10.17 | | 17.3 | | 9.64 | | -0.5 | | 0.0 | | 1637.4 | | 74.4 | |
| 17:03:00 | 0.5 | | 9.77 | | 17.8 | | 10.02 | | 0.0 | | 0.0 | | 1595.0F | | 73.2F | |
| 200 | 3.4 | | 10.14 | | 17.2 | | 9.69 | | -0.2 | | 0.0 | | 1604.0 | | 71.1 | |
| 300 | 3.4 | | 10.15 | | 17.2 | | 9.69 | | -0.2 | | 0.0 | | 1604.0 | | 71.1 | |
| 17:08:00 | -0.8 | | 9.96 | | 17.5 | | 9.89 | | -0.5 | | 0.0 | | 688.0F | | 73.0F | |
| 200 | 3.3 | | 9.94 | | 17.7 | | 9.89 | | -0.1 | | 0.0 | | 1037.1 | | 73.6 | |
| 300 | 3.3 | | 9.94 | | 17.7 | | 9.89 | | -0.1 | | 0.0 | | 1037.1 | | 73.6 | |
| 17:13:00 | 7.0 | | 9.43 | | 18.4 | | 10.38 | | -0.2 | | 0.0 | | 703.8F | | 75.4F | |
| 200 | 3.4 | | 9.97 | | 17.3 | | 9.89 | | 0.3 | | 0.0 | | 700.0 | | 74.9 | |
| 300 | 3.4 | | 9.97 | | 17.3 | | 9.89 | | 0.2 | | 0.0 | | 699.6 | | 74.9 | |
| 17:18:00 | 5.0 | | 9.38 | | 18.8 | | 10.42 | | 1.0 | | 0.0 | | 735.3F | | 74.5F | |
| 200 | 3.4 | | 9.46 | | 18.7 | | 10.35 | | 0.6 | | 0.0 | | 720.5 | | 74.9 | |
| 300 | 3.4 | | 9.46 | | 18.7 | | 10.35 | | 0.5 | | 0.0 | | 720.7 | | 74.9 | |
| 17:23:00 | 0.0 | | 9.93 | | 18.0 | | 9.90 | | 0.7 | | 0.0 | | 713.6F | | 75.3F | |
| 200 | 3.2 | | 9.79 | | 18.4 | | 10.02 | | 0.7 | | 0.0 | | 717.6 | | 75.2 | |
| 300 | 3.2 | | 9.79 | | 18.4 | | 10.02 | | 0.8 | | 0.0 | | 717.7 | | 75.2 | |
| 17:28:00 | 0.4 | | 9.84 | | 18.0 | | 9.94 | | 1.7 | | 0.0 | | 726.8F | | 74.3F | |
| 200 | 3.3 | | 9.87 | | 18.0 | | 9.96 | | 0.8 | | 0.0 | | 713.5 | | 73.9 | |
| 300 | 3.3 | | 9.88 | | 18.0 | | 9.96 | | 0.8 | | 0.0 | | 713.5 | | 73.9 | |

START TEST 3

TC FAILED

THIS IS NOT A PROCESS TEMP DROP

123 TRC ENVIRONMENTAL CONSULTANTS OLD BETHPAGE LANDFILL

0315

| 100<br>200 | 01<br>CO<br>PPM | 02 | 03<br>OXYGEN<br>PERCENT | 04 | 05<br>NOX<br>PPM | 06 | 07<br>CO2<br>PERCENT | 08 | 09<br>SO2<br>PPM | 10 | 11<br>THC<br>PPM CH3 | 12 | 13<br>STACK<br>TEMP | 14 | 15<br>MELS<br>TEMP | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17:33:00 | -0.9 | | 9.77 | | 17.9 | | 10.03 | | -0.5 | | 0.0 | | 713.4F | | 73.7F | |
| 200 | 2.9 | | 9.87 | | 17.9 | | 9.97 | | 1.0 | | 0.0 | | 735.1 | | 73.0 | |
| 300 | 2.9 | | 9.87 | | 17.9 | | 9.97 | | 1.0 | | 0.0 | | 735.1 | | 73.0 | |
| 17:38:00 | 6.3 | | 10.32 | | 17.1 | | 9.55 | | 1.5 | | 0.0 | | 675.7F | | 75.0F | |
| 200 | 3.1 | | 9.95 | | 18.0 | | 9.88 | | 0.8 | | 0.0 | | 699.7 | | 74.2 | |
| 300 | 3.1 | | 9.95 | | 18.0 | | 9.88 | | 0.8 | | 0.0 | | 699.6 | | 74.2 | |
| 17:43:00 | 1.1 | | 10.01 | | 17.3 | | 9.93 | | 1.5 | | 0.0 | | 1486.5F | | 74.0F | |
| 200 | 2.9 | | 10.30 | | 17.0 | | 9.58 | | 0.8 | | 0.0 | | 1113.1 | | 74.3 | |
| 300 | 2.9 | | 10.30 | | 17.0 | | 9.58 | | 0.8 | | 0.0 | | 1112.9 | | 74.3 | |
| 17:48:00 | 6.4 | | 9.67 | | 18.1 | | 10.12 | | -0.7 | | 0.0 | | OPEN F | | 70.1F | |
| 200 | 2.8 | | 9.87 | | 17.7 | | 9.97 | | 0.8 | | 0.0 | | 1202.8 | | 71.2 | |
| 300 | 2.8 | | 9.87 | | 17.7 | | 9.97 | | 0.9 | | 0.0 | | 1092.2 | | 71.2 | |
| 7:53:00 | -0.5 | | 9.70 | | 18.4 | | 10.18 | | -0.5 | | 0.0 | | 1515.1F | | 73.1F | |
| 200 | 2.4 | | 9.74 | | 18.2 | | 10.11 | | 0.6 | | 0.0 | | 288.0 | | 70.8 | |
| 00 | 2.4 | | 9.74 | | 18.2 | | 10.11 | | 0.7 | | 0.0 | | 573.6 | | 70.8 | |
| 7:58:00 | 6.2 | | 9.66 | | 18.6 | | 10.02 | | 1.3 | | 0.0 | | 1515.4F | | 71.6F | |
| 200 | 2.0 | | 9.64 | | 18.5 | | 10.17 | | 0.7 | | 0.0 | | 1607.8 | | 71.8 | |
| 300 | 2.0 | | 9.61 | | 18.5 | | 10.17 | | 0.7 | | 0.0 | | 1607.8 | | 71.8 | |
| 18:03:00 | 2.4 | | 9.83 | | 18.1 | | 9.98 | | 1.7 | | 0.0 | | 1626.0F | | 70.8F | |
| 200 | 1.7 | | 9.83 | | 18.2 | | 10.03 | | 1.0 | | 0.0 | | 1620.7 | | 71.4 | |
| 300 | 1.7 | | 9.83 | | 18.2 | | 10.03 | | 1.0 | | 0.0 | | 1620.7 | | 71.4 | |
| 18:08:00 | 6.1 | | 10.23 | | 17.1 | | 9.64 | | 2.0 | | 0.0 | | 1607.6F | | 72.7F | |
| 200 | 2.3 | | 10.23 | | 17.2 | | 9.63 | | 0.9 | | 0.0 | | 1611.5 | | 72.5 | |
| 300 | 2.3 | | 10.23 | | 17.2 | | 9.63 | | 0.9 | | 0.0 | | 1611.5 | | 72.5 | |
| 18:13:00 | 0.8 | | 9.63 | | 18.4 | | 10.24 | | 2.0 | | 0.0 | | 1630.7F | | 71.8F | |
| 200 | 1.6 | | 10.02 | | 17.4 | | 9.83 | | 1.2 | | 0.0 | | 1616.0 | | 71.0 | |
| 300 | 1.6 | | 10.02 | | 17.4 | | 9.83 | | 1.1 | | 0.0 | | 1616.0 | | 71.0 | |
| 18:18:00 | -2.1 | | 9.73 | | 18.2 | | 10.08 | | 0.0 | | 0.0 | | 1632.2F | | 71.7F | |
| 200 | 1.7 | | 9.73 | | 18.2 | | 10.10 | | 1.1 | | 0.0 | | 1635.2 | | 71.9 | |
| 300 | 1.7 | | 9.73 | | 18.2 | | 10.10 | | 1.3 | | 0.0 | | 1635.2 | | 71.9 | |

| 123 | TRC ENVIRONMENTAL CONSULTANTS | | | | OLD BETHPAGE LANDFILL | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0315 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 100 | CO | | OXYGEN | | NOX | | CO2 | | SO2 | | THC | | STACK | | MELS | |
| 200 | PPM | | PERCENT | | PPM | | PERCENT | | PPM | | PPM CH3 | | TEMP | | TEMP | |
| 18:23:00 | 0.4 | | 9.97 | | 17.8 | | 9.93 | | 2.0 | | 0.0 | | 1624.1F | | 68.0F | |
| 200 | 1.9 | | 9.85 | | 17.9 | | 9.99 | | 1.5 | | 0.0 | | 1628.6 | | 71.7 | |
| 300 | 1.9 | | 9.85 | | 17.9 | | 9.99 | | 1.5 | | 0.0 | | 1628.6 | | 71.7 | |
| 18:28:00 | -0.9 | | 9.92 | | 17.5 | | 9.93 | | 2.2 | | 0.0 | | 1626.5F | | 72.2F | |
| 200 | 0.8 | | 9.96 | | 17.7 | | 9.90 | | 1.2 | | 0.0 | | 1625.3 | | 70.1 | |
| 300 | 0.8 | | 9.96 | | 17.7 | | 9.90 | | 1.1 | | 0.0 | | 1625.3 | | 70.0 | |
| 18:33:00 | 3.6 | | 9.89 | | 17.5 | | 9.90 | | 1.7 | | 0.0 | | 1621.0F | | 72.6F | |
| 200 | 1.9 | | 9.98 | | 17.6 | | 9.89 | | 1.8 | | 0.0 | | 1624.5 | | 72.1 | |
| 300 | 1.9 | | 9.98 | | 17.6 | | 9.89 | | 1.8 | | 0.0 | | 1624.5 | | 72.1 | |
| 18:38:00 | 3.8 | | 9.94 | | 17.5 | | 9.90 | | 2.0 | | 0.0 | | 1612.4F | | 69.7F | |
| 200 | 1.4 | | 10.02 | | 17.5 | | 9.83 | | 1.9 | | 0.0 | | 1615.7 | | 70.8 | |
| 300 | 1.4 | | 10.02 | | 17.5 | | 9.83 | | 1.9 | | 0.0 | | 1615.6 | | 70.8 | |
| 18:43:00 | 6.0 | | 9.44 | | 18.4 | | 10.32 | | 0.7 | | 0.0 | | 1639.6F | | 71.3F | |
| 200 | 1.3 | | 9.79 | | 17.8 | | 10.08 | | 2.3 | | 0.0 | | 1622.8 | | 70.4 | |
| 300 | 1.3 | | 9.78 | | 17.8 | | 10.07 | | 2.4 | | 0.0 | | 1622.8 | | 70.4 | |
| 18:48:00 | 1.9 | | 9.73 | | 18.2 | | 10.15 | | 3.0 | | 0.0 | | 1635.6F | | 68.9F | |
| 200 | 1.4 | | 9.55 | | 18.5 | | 10.29 | | 2.2 | | 0.0 | | 1639.8 | | 69.6 | |
| 300 | 1.4 | | 9.55 | | 18.5 | | 10.29 | | 2.3 | | 0.0 | | 1639.7 | | 69.6 | |
| 18:53:00 | 0.1 | | 9.82 | | 18.1 | | 10.18 | | 3.0 | | 0.0 | | 1629.4F | | 67.5F | |
| 200 | 1.0 | | 9.72 | | 18.1 | | 10.14 | | 2.5 | | 0.0 | | 1630.9 | | 68.7 | |
| 300 | 1.0 | | 9.72 | | 18.1 | | 10.14 | | 2.5 | | 0.0 | | 1630.9 | | 68.7 | |
| 18:58:00 | 3.2 | | 9.66 | | 18.0 | | 10.14 | | 3.5 | | 0.0 | | 1624.8F | | 66.4F | |
| 200 | 1.1 | | 9.73 | | 17.9 | | 10.12 | | 2.7 | | 0.0 | | 1625.8 | | 67.5 | |
| 300 | 1.1 | | 9.73 | | 17.9 | | 10.12 | | 2.7 | | 0.0 | | 1625.8 | | 67.5 | |
| 19:01:56 | 0.8 | | 0.11 | | 92.6 | | 0.39 | | 3.5 | | 0.0 | | 1625.0F | | 68.2F | |
| 200 | 1.4 | | 6.51 | | 34.7 | | 6.71 | | 2.7 | | 0.0 | | 1623.8 | | 67.7 | |
| 300 | 1.5 | | 7.26 | | 32.3 | | 7.51 | | 2.8 | | 0.0 | | 1623.9 | | 67.5 | |
| 19:04:05 | 95.4 | | 0.11 | | 0.4 | | 0.34 | | 1.7 | | 0.0 | | 1630.7F | | 67.1F | |
| 200 | 94.4 | | 0.11 | | 5.1 | | 0.35 | | 2.5 | | 0.0 | | 1628.7 | | 67.4 | |
| 300 | 23.8 | | 3.10 | | 45.7 | | 3.26 | | 2.8 | | 0.0 | | 1625.0 | | 67.9 | |

| 23 | TRC ENVIRONMENTAL CONSULTANTS | | | | OLD BETHPAGE LANDFILL | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1315 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 00<br>200 | CO<br>PPM | | OXYGEN<br>PERCENT | | NOX<br>PPM | | CO2<br>PERCENT | | SO2<br>PPM | | THC<br>PPM CH3 | | STACK<br>TEMP | | NELS<br>TEMP | |
| 9:09:41 | 4.2 | | 0.12 | | 0.0 | | 0.33 | | 227.2 | | 0.0 | | 1615.5F | | 68.4F | |
| 200 | 1.9 | | 0.11 | | 0.0 | | 0.33 | | ~~227.7~~ | | 0.0 | | 1620.2 | | 67.6 | |
| 00 | 4.2 | | 0.08 | | 0.1 | | 0.33 | | 210.2 | | 0.0 | | 1626.6 | | 67.2 | |
| 9:11:37 | 4.2 | | 3.12 | | -0.2 | | 21.92 | | 8.2 | | 0.0 | | 1595.8F | | 67.7F | |
| 00 | 0.8 | | 16.20 | | 0.0 | | ~~0.31~~ | | 161.6 | | 0.0 | | 1610.9 | | 67.6 | |
| 00 | 1.0 | | 0.85 | | 0.0 | | 5.91 | | 180.2 | | 0.0 | | 1616.0 | | 67.5 | |
| 9:13:25 | 1.2 | | 22.41 | | -0.2 | | 3.27 | | 6.0 | | 0.0 | | 1588.8F | | 70.0F | |
| 00 | 4.5 | | ~~22.40~~ | | -0.2 | | 3.28 | | 6.1 | | 0.0 | | 1589.0 | | 69.9 | |
| 10 | 0.4 | | 6.38 | | 0.0 | | 9.28 | | 100.7 | | 0.0 | | 1603.3 | | 68.0 | |
| 9:16:23 | -0.7 | | 0.08 | | 94.2 | | 0.33 | | 4.0 | | 0.0 | | 1605.3F | RACK | 71.0F | |
| 10 | 2.1 | | 10.90 | | ~~37.6~~ | | 2.10 | | 4.6 | | 0.0 | | 1591.8 | | 70.7 | |
| 10 | 1.4 | | 11.44 | | 25.0 | | 5.40 | | 5.6 | | 0.0 | | 1592.5 | | 69.9 | |
| :18:32 | 5.3 | | 0.04 | | 43.0 | | 0.32 | | 3.5 | | 0.0 | | 1613.5F | | 71.7F | |
| 10 | 3.1 | | 0.03 | | ~~43.0~~ | | 0.32 | | 3.3 | | 0.0 | | 1612.7 | | 71.9 | |
| 0 | 2.4 | | 5.04 | | 51.6 | | 1.21 | | 3.7 | | 0.0 | | 1600.1 | | 71.2 | |
| :20:56 | 95.7 | | 0.03 | | -0.1 | | 0.32 | | 4.2 | | 0.0 | | 1617.0F | | 71.3F | |
| 10 | 58.8 | | 0.08 | | 18.6 | | 0.32 | | 5.6 | | 0.0 | | 1615.9 | | 71.4 | |
| 00 | 34.8 | | 0.06 | | 42.2 | | 0.32 | | 4.6 | | 0.0 | | 1612.6 | | 71.4 | |
| 9:24:12 | 54.6 | | 14.50 | | -0.2 | | 0.32 | | 4.5 | | 0.0 | | 1617.4F | | 69.3F | |
| 00 | ~~56.7~~ | | 14.40 | | -0.1 | | 0.31 | | 3.6 | | 0.0 | | 1616.2 | | 70.0 | |
| 00 | 76.2 | | 8.16 | | 0.6 | | 0.31 | | 3.6 | | 0.0 | | 1617.1 | | 71.0 | |
| 9:27:37 | -0.7 | | 0.05 | | 0.0 | | 0.31 | | 233.0 | | 0.0 | | 1606.9F | | 65.5F | |
| 00 | 51.6 | | 12.24 | | -0.1 | | 0.31 | | ~~36.5~~ | | 0.0 | | 1614.7 | | 68.9 | |
| 00 | 52.5 | | 12.42 | | -0.1 | | 0.31 | | 33.3 | | 0.0 | | 1614.9 | | 69.1 | |
| 9:29:06 | 4.2 | | 0.04 | | -0.1 | | 0.31 | | 92.7 | | 0.0 | | 1616.6F | | 66.1F | |
| 00 | 3.9 | | 0.05 | | 0.0 | | 0.53 | | ~~124.2~~ | | 0.0 | | 1614.2 | | 65.1 | |
| 10 | 36.1 | | 8.14 | | -0.1 | | 0.35 | | 80.3 | | 0.0 | | 1613.9 | | 67.5 | |
| 9:30:14 | -2.3 | | 3.11 | | -0.2 | | 21.84 | | 5.2 | | 0.0 | | 1617.8F | | 65.0F | |
| 00 | 1.5 | | ~~1.07~~ | | 0.0 | | ~~2.45~~ | | 77.4 | | 0.0 | | 1615.4 | | 65.1 | |
| 00 | 22.7 | | 5.21 | | -0.1 | | 3.83 | | 88.1 | | 0.0 | | 1613.8 | | 66.5 | |

123 TRC ENVIRONMENTAL CONSULTANTS OLD BETHPAGE LANDFILL

| 0315<br>100<br>200 | 01<br>CO<br>PPM | 02 | 03<br>OXYGEN<br>PERCENT | 04 | 05<br>NOX<br>PPM | 06 | 07<br>CO2<br>PERCENT | 08 | 09<br>SO2<br>PPM | 10 | 11<br>THC<br>PPM CH3 | 12 | 13<br>STACK<br>TEMP | 14 | 15<br>MELS<br>TEMP | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19:32:46 | 5.7 | | 22.71 | | -0.3 | | 3.17 | | 3.2 | | 0.0 | | 1619.1F | | 65.4F | |
| 200 | 0.8 | | 11.19 | | -0.1 | | 6.89 | | 38.1 | | 0.0 | | 1616.3 | | 65.0 | |
| 300 | 1.0 | | 10.43 | | -0.1 | | 6.46 | | 51.1 | | 0.0 | | 1615.9 | | 65.0 | |
| 19:34:03 | -2.3 | | 9.63 | | 18.0 | | 10.20 | | 5.0 | | 0.0 | | 1623.0F | | 64.7F | |
| 200 | -0.2 | | 12.07 | | 7.4 | | 9.07 | | 5.4 | | 0.0 | | 1622.0 | | 64.7 | |
| 300 | 0.2 | | 14.33 | | 1.3 | | 8.35 | | 12.0 | | 0.0 | | 1618.0 | | 64.9 | |
| 19:35:00 | 0.1 | | 9.64 | | 18.1 | | 10.21 | | 5.2 | | 0.0 | | 1624.8F | | 65.6F | |
| 200 | 0.3 | | 10.83 | | 12.8 | | 9.63 | | 5.0 | | 0.0 | | 1622.7 | | 64.9 | |
| 300 | 0.5 | | 16.12 | | 5.6 | | 7.18 | | 4.5 | | 0.0 | | 1619.7 | | 64.9 | |
| 19:40:00 | 3.1 | | 9.58 | | 18.4 | | 10.26 | | 4.0 | | 0.0 | | 1619.8F | | 68.9F | |
| 200 | 0.7 | | 9.66 | | 18.3 | | 10.11 | | 4.9 | | 0.0 | | 1620.7 | | 67.6 | |
| 300 | 0.7 | | 9.66 | | 18.3 | | 10.10 | | 4.9 | | 0.0 | | 1620.7 | | 67.6 | |
| 19:45:00 | -2.3 | | 10.03 | | 17.5 | | 9.83 | | 5.7 | | 0.0 | | 1607.4F | | 68.4F | |
| 200 | 0.7 | | 9.74 | | 18.3 | | 9.99 | | 4.9 | | 0.0 | | 1619.9 | | 68.3 | |
| 300 | 0.7 | | 9.75 | | 18.3 | | 9.99 | | 4.9 | | 0.0 | | 1619.9 | | 68.3 | |
| 19:50:00 | 0.4 | | 10.03 | | 17.0 | | 9.80 | | 5.2 | | 0.0 | | 1594.9F | | 63.2F | |
| 200 | 0.6 | | 10.08 | | 17.2 | | 9.72 | | 4.9 | | 0.0 | | 1598.3 | | 65.2 | |
| 300 | 0.6 | | 10.08 | | 17.2 | | 9.72 | | 4.9 | | 0.0 | | 1598.3 | | 65.2 | |
| 19:55:00 | -2.3 | | 9.60 | | 18.3 | | 10.20 | | 3.5 | | 0.0 | | 1615.4F | | 58.6F | |
| 200 | -0.3 | | 9.73 | | 17.6 | | 10.04 | | 4.7 | | 0.0 | | 1605.1 | | 62.1 | |
| 300 | -0.3 | | 9.73 | | 17.6 | | 10.04 | | 4.8 | | 0.0 | | 1605.1 | | 62.1 | |
| 20:00:00 | -2.3 | | 9.63 | | 18.4 | | 10.20 | | 5.0 | | 0.0 | | 1621.5F | | 59.1F | |
| 200 | -1.7 | | 9.56 | | 18.3 | | 10.23 | | 4.4 | | 0.0 | | 1619.0 | | 59.2 | |
| 300 | -1.7 | | 9.56 | | 18.3 | | 10.23 | | 4.3 | | 0.0 | | 1619.0 | | 59.2 | |
| 20:05:00 | -2.3 | | 21.52 | | 4.8 | | 0.66 | | 5.0 | | 0.0 | | OPEN F | | 58.1F | |
| 200 | -2.0 | | 11.50 | | 16.4 | | 8.55 | | 4.7 | | 0.0 | | 1622.7 | | 58.5 | |
| 300 | -2.0 | | 11.50 | | 16.4 | | 8.55 | | 4.7 | | 0.0 | | 1622.6 | | 58.5 | |
| 20:05:21 | 1.5 | | 21.50 | | 1.5 | | 0.41 | | 5.5 | | 0.0 | | OPEN F | | 58.3F | |
| 200 | 0.6 | | 21.47 | | 2.2 | | 0.42 | | 5.6 | | 0.0 | | OPEN | | 58.3 | |
| 300 | -1.8 | | 12.29 | | 15.3 | | 7.89 | | 4.7 | | 0.0 | | 1622.6 | | 58.4 | |

123 TRC ENVIRONMENTAL CONSULTANTS OLD BETHPAGE LANDFILL

| 0315 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | CO | | OXYGEN | | NOX | | CO2 | | SO2 | | THC | | STACK | | MELS | |
| 200 | PPM | | PERCENT | | PPM | | PERCENT | | PPM | | PPM CH3 | | TEMP | | TEMP | |

# APPENDIX D

## LABORATORY DATA AND

## CHAIN OF CUSTODY

## GRASEBY NUTECH-RTL

Client: TRC Environmental Consultants    Received: 11/13/92
RTL ID: 92111351-17    File ID: T1126
Sample ID: 12034-0-B    Description: Condensate

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 100 |
| Toluene-$d_8$ | 107 |
| 4-Bromofluorobenzene | 89 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000**    **BQL: Below Quantitation Limit**

# GRASEBY NUTECH–RTL

Client: TRC Environmental Consultants
Received: 11/13/92
RTL ID: 92111351-17
File ID: T1126
Sample ID: 12034-0-B
Description: Condensate

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Carbon dioxide | 1.82 | 56 | 44 |

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-17 | File ID: | T1126 |
| Sample ID: | 12034-0-B | Description: | Condensate |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

ND: not detected

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-18 | File ID: | T1127 |
| Sample ID: | 0-1-0-4 | Description: | Condensate |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 96 |
| Toluene-$d_8$ | 106 |
| 4-Bromofluorobenzene | 94 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-18 | File ID: | T1127 |
| Sample ID: | 0-1-0-4 | Description: | Condensate |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Carbon dioxide | 1.81 | 83 | 44 |

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-18 | File ID: | T1127 |
| Sample ID: | 0-1-0-4 | Description: | Condensate |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

ND: not detected

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-19 | File ID: | T1128 |
| Sample ID: | 0-5-0-8 | Description: | Condensate |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 99 |
| Toluene-$d_8$ | 104 |
| 4-Bromofluorobenzene | 87 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-19 | File ID: | T1128 |
| Sample ID: | 0-5-0-8 | Description: | Condensate |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Carbon dioxide | 1.82 | 74 | 44 |

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-19 | File ID: | T1128 |
| Sample ID: | 0-5-0-8 | Description: | Condensate |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

ND: not detected

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-20 | File ID: | T1129 |
| Sample ID: | 0-9-0-12 | Description: | Condensate |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 102 |
| Toluene-$d_8$ | 104 |
| 4-Bromofluorobenzene | 89 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | 20 |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-20 | File ID: | T1129 |
| Sample ID: | 0-9-0-12 | Description: | Condensate |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Carbon dioxide | 1.81 | 41 | 44 |

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-20 | File ID: | T1129 |
| Sample ID: | 0-9-0-12 | Description: | Condensate |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

ND: not detected

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-12 | File ID: | T1134 |
| Sample ID: | 0-FB-1 & 2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 86 |
| Toluene-$d_8$ | 94 |
| 4-Bromofluorobenzene | 80 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-12 | File ID: | T1134 |
| Sample ID: | 0-FB-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Carbon dioxide | 1.78 | 5,400 | 44 |

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-12 | File ID: | T1134 |
| Sample ID: | 0-FB-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

ND: not detected

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-4 [a] | File ID: | T1135/T1136 |
| Sample ID: | 0-1-1 & 2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 91 |
| Toluene-$d_8$ | 99 |
| 4-Bromofluorobenzene | 83 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | a |
| 75-01-4 | Vinyl chloride | a |
| 74-83-9 | Bromomethane | a |
| 75-00-3 | Chloroethane | a |
| 75-69-4 | Trichlorofluoromethane | a |
| 75-35-4 | 1,1-Dichloroethene | a |
| 67-64-1 | Acetone | a |
| 75-15-0 | Carbon disulfide | a |
| 75-09-2 | Methylene chloride | 45 |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

a: See Endnotes

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-4 [a] | File ID: | T1135/T1136 |
| Sample ID: | 0-1-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Carbon dioxide | 1.52 | >1,200 [a] | 44 |

a: See Endnotes

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-4 [a] | File ID: | T1135/1136 |
| Sample ID: | 0-1-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

a: See Endnotes

ND: not detected

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-5 | File ID: | T1137 |
| Sample ID: | 0-2-1 & 2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 93 |
| Toluene-$d_8$ | 96 |
| 4-Bromofluorobenzene | 79 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | 25 |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

Scan delay: 1.97 minutes

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-5 | File ID: | T1137 |
| Sample ID: | 0-2-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| None detected | | | |

Scan delay: 1.97

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-5 | File ID: | T1137 |
| Sample ID: | 0-2-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

Scan delay: 1.97

ND: not detected

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-6 | File ID: | T1138 |
| Sample ID: | 0-3-1 & 2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 89 |
| Toluene-$d_8$ | 96 |
| 4-Bromofluorobenzene | 80 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | 22 |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

Scan delay: 1.97 minutes

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-6 | File ID: | T1138 |
| Sample ID: | 0-3-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| None detected | | | |

Scan delay: 1.97

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-6 | File ID: | T1138 |
| Sample ID: | 0-3-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

Scan delay: 1.97

ND: not detected

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-7 | File ID: | T1139 |
| Sample ID: | 0-4-1 & 2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 91 |
| Toluene-$d_8$ | 95 |
| 4-Bromofluorobenzene | 83 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | 750 |
| 75-09-2 | Methylene chloride | 35 |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | 58 |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | 52 |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | 180 |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

Scan delay: 1.97 minutes

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-7 | File ID: | T1139 |
| Sample ID: | 0-4-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| Hexane | 6.26 | 100 | 86 |
| Unknown | 8.86 | 35 | --- |
| α Pinene | 18.91 | 180 | 136 |
| Camphene | 19.57 | 36 | 136 |
| Ethylmethylbenzene isomer | 20.54 | 22 | 120 |
| 3-Methyl-5-propylnonane | 21.16 | 37 | 184 |
| Unknown hydrocarbon | 21.75 | 31 | --- |
| Unknown hydrocarbon | 22.02 | 46 | --- |

Scan delay: 1.97

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-7 | File ID: | T1139 |
| Sample ID: | 0-4-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

Scan delay: 1.97

ND: not detected

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-8 [b] | File ID: | T1140 |
| Sample ID: | 0-5-1 & 2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 91 |
| Toluene-$d_8$ | 94 |
| 4-Bromofluorobenzene | 81 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | 30 |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

Scan delay: 1.97 minutes
b: See Endnotes

## GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-8 [b] | File ID: | T1140 |
| Sample ID: | 0-5-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| None detected | | | |

Scan delay: 1.97
b: See Endnotes

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-8 [b] | File ID: | T1140 |
| Sample ID: | 0-5-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

Scan delay: 1.97
b: See Endnotes

ND: not detected

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-9 [b] | File ID: | T1141 |
| Sample ID: | 0-6-1 & 2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 86 |
| Toluene-$d_8$ | 92 |
| 4-Bromofluorobenzene | 77 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | 46 |
| 75-09-2 | Methylene chloride | 28 |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

Scan delay: 1.97 minutes
b: See Endnotes

## GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-9 [b] | File ID: | T1141 |
| Sample ID: | 0-6-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| None detected | | | |

Scan delay: 1.97
b: See Endnotes

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-9 [b] | File ID: | T1141 |
| Sample ID: | 0-6-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

Scan delay: 1.97

b: See Endnotes

ND: not detected

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-10 | File ID: | T1142 |
| Sample ID: | 0-7-1 & 2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 95 |
| Toluene-$d_8$ | 84 |
| 4-Bromofluorobenzene | 79 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

Scan delay: 1.97 minutes

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-10 | File ID: | T1142 |
| Sample ID: | 0-7-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| None detected | | | |

Scan delay: 1.97

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-10 | File ID: | T1142 |
| Sample ID: | 0-7-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

Scan delay: 1.97

ND: not detected

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-11 [b] | File ID: | T1143 |
| Sample ID: | 0-8-1 & 2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 97 |
| Toluene-$d_8$ | 97 |
| 4-Bromofluorobenzene | 83 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

Scan delay: 1.97 minutes
b: See Endnotes

## GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-11 [b] | File ID: | T1143 |
| Sample ID: | 0-8-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| None detected | | | |

Scan delay: 1.97
b: See Endnotes

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-11 [b] | File ID: | T1143 |
| Sample ID: | 0-8-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

Scan delay: 1.97
b: See Endnotes

ND: not detected

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-13 | File ID: | T1144 |
| Sample ID: | 0-9-1 & 2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 88 |
| Toluene-$d_8$ | 95 |
| 4-Bromofluorobenzene | 80 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

Scan delay: 1.97 minutes

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-13 | File ID: | T1144 |
| Sample ID: | 0-9-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| None detected | | | |

Scan delay: 1.97

# GRASEBY NUTECH-RTL

Client: TRC Environmental Consultants
Received: 11/13/92
RTL ID: 92111351-13
File ID: T1144
Sample ID: 0-9-1 & 2
Description: VOST pair

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

Scan delay: 1.97

ND: not detected

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-14 | File ID: | T1149 |
| Sample ID: | 0-10-1 & 2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 94 |
| Toluene-$d_8$ | 95 |
| 4-Bromofluorobenzene | 87 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

Scan delay: 1.97 minutes

# GRASEBY NUTECH-RTL

Client: TRC Environmental Consultants
Received: 11/13/92
RTL ID: 92111351-14
File ID: T1149
Sample ID: 0-10-1 & 2
Description: VOST pair

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| None detected | | | |

Scan delay: 1.97

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-14 | File ID: | T1149 |
| Sample ID: | 0-10-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

Scan delay: 1.97

ND: not detected

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-15 | File ID: | T1150 |
| Sample ID: | 0-11-1 & 2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 90 |
| Toluene-$d_8$ | 87 |
| 4-Bromofluorobenzene | 84 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

Scan delay: 1.97 minutes

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-15 | File ID: | T1150 |
| Sample ID: | 0-11-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| None detected | | | |

Scan delay: 1.97

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-15 | File ID: | T1150 |
| Sample ID: | 0-11-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

Scan delay: 1.97

ND: not detected

# GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-16 | File ID: | T1151 |
| Sample ID: | 0-12-1 & 2 | Description: | VOST pair |

| Surrogate Percent Recovery | |
|---|---|
| 1,2-Dichloroethane-$d_4$ | 89 |
| Toluene-$d_8$ | 96 |
| 4-Bromofluorobenzene | 83 |

| CAS Number | Target Compound | Results (ng) |
|---|---|---|
| 74-87-3 | Chloromethane | BQL |
| 75-01-4 | Vinyl chloride | BQL |
| 74-83-9 | Bromomethane | BQL |
| 75-00-3 | Chloroethane | BQL |
| 75-69-4 | Trichlorofluoromethane | BQL |
| 75-35-4 | 1,1-Dichloroethene | BQL |
| 67-64-1 | Acetone | BQL |
| 75-15-0 | Carbon disulfide | BQL |
| 75-09-2 | Methylene chloride | BQL |
| 156-60-5 | *trans*-1,2-Dichloroethene | BQL |
| 75-34-3 | 1,1-Dichloroethane | BQL |
| 78-93-3 | 2-Butanone | BQL |
| 67-66-3 | Chloroform | BQL |
| 71-55-6 | 1,1,1-Trichloroethane | BQL |
| 56-23-5 | Carbon tetrachloride | BQL |
| 71-43-2 | Benzene | BQL |
| 107-06-2 | 1,2-Dichloroethane | BQL |
| 79-01-6 | Trichloroethene | BQL |
| 78-87-5 | 1,2-Dichloropropane | BQL |
| 75-27-4 | Bromodichloromethane | BQL |
| 108-10-1 | 4-Methyl-2-pentanone | BQL |
| 10061-01-5 | *cis*-1,3-Dichloropropene | BQL |
| 108-88-3 | Toluene | BQL |
| 10061-02-6 | *trans*-1,3-Dichloropropene | BQL |
| 79-00-5 | 1,1,2-Trichloroethane | BQL |
| 591-78-6 | 2-Hexanone | BQL |
| 127-18-4 | Tetrachloroethene | BQL |
| 124-48-1 | Dibromochloromethane | BQL |
| 108-90-7 | Chlorobenzene | BQL |
| 100-41-4 | Ethylbenzene | BQL |
| 1330-20-7 | Xylene (total) | BQL |
| 100-42-5 | Styrene | BQL |
| 75-25-2 | Bromoform | BQL |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | BQL |
| 95-50-11 | 1,2-Dichlorobenzene | BQL |
| 541-73-1 | 1,3-Dichlorobenzene | BQL |
| 106-46-7 | 1,4-Dichlorobenzene | BQL |

**Quantitation Range (ng): 20 – 1,000** **BQL: Below Quantitation Limit**

Scan delay: 1.97 minutes

## GRASEBY NUTECH–RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-16 | File ID: | T1151 |
| Sample ID: | 0-12-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| None detected | | | |

Scan delay: 1.97

# GRASEBY NUTECH-RTL

| | | | |
|---|---|---|---|
| Client: | TRC Environmental Consultants | Received: | 11/13/92 |
| RTL ID: | 92111351-16 | File ID: | T1151 |
| Sample ID: | 0-12-1 & 2 | Description: | VOST pair |

**Tentatively Identified Compounds**

| Compound | Retention Time (minutes) | Results (ng) | Molecular Weight (AMU) |
|---|---|---|---|
| 2-Chloroethyl vinyl ether | | ND | 107 |
| Chlorotrifluoromethane (Freon 13) | | ND | 104 |
| *cis*-1,2-Dichloroethene | | ND | 99 |
| Benzaldehyde | | ND | 106 |
| Vinyl acetate | | ND | 86 |

Scan delay: 1.97

ND: not detected

**Endnotes:**

a) Run aborted because of high levels of primarily carbon dioxide. We immediately restarted the instrument and obtained a complete chromatogram for the remainder of the run. Early eluting targets were not detectable because of the problem. Internal standards, however, did recover within expected QC ranges and a scan delay of 1.97 minutes was instituted on all remaining samples.

b) A sample cartridge was broken while being attached to the recovery system. The chemist transferred the sorbent into another clean cartridge before analysis. Contamination is possible but not likely. All QC measures were within expected ranges.

c) Detector saturation or data dropout occurred during the elution of this compound. The actual amount of the compound in this sample is higher. Data dropout is a precursor to MS shutdown and run abortion.

TRC Environmental Consultants, Inc.

# CHAIN OF CUSTODY RECORD

№ 5836

| PROJECT NO. | PROJECT NAME |
|---|---|
| 12034-E71 | RTP ASSOCIATES |

SAMPLERS: (Signature) [signatures]

(Printed) DAVID PRATER, RAY POTTER

| FIELD SAMPLE NUMBER | DATE | TIME | COMP. | GRAB | STATION LOCATION | NO. OF CONTAINERS | VOST ANALYSIS (SEE ATTACHED SHEET FOR COMPOUNDS) | | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| [redacted] | | | | | | | | | | | | | | |
| 12034-0-B | | | | ✓ | OUTLET | | ✓ | | | | | | | HPLC DI WATER BLANK |
| 0-1-0-4 | | | ✓ | | | | ✓ | | | | | | | CONDENSATE RUN 1-4 ~~HPLC DI WATER BLANK~~ DP |
| 0-5-0-8 | | | ✓ | | | | ✓ | | | | | | | CONDENSATE RUN 5-8 |
| 0-9-0-12 | | | ✓ | | | | ✓ | | | | | | | CONDENSATE RUN 9-12 |
| 0-1-1 | | | ✓ | | | | ✓ | | | | | | | FRONT |
| 0-1-2 | | | ✓ | | | | ✓ | | | | | | | BACK |

| Relinquished by: (Signature) | Date / Time | Received by: (Signature) | Relinquished by: (Signature) | Date / Time | Received by: (Signature) |
|---|---|---|---|---|---|
| [signature] | 12Nov92 / 1400 | | | | |
| (Printed) DAVID A. PRATER | | (Printed) | (Printed) | | (Printed) |

| Relinquished by: (Signature) | Date / Time | Received for Laboratory by: (Signature) | Date / Time | Remarks |
|---|---|---|---|---|
| | | [signature] | 11-13-92 / 11:00 | FLOW ON FRONT TRAP WAS IN THE DIRECTION OF THE WHITE DOT ON TUBE. WHITE DOT WAS AT BOTTOM. |
| (Printed) | | (Printed) Karen L. Fitzwatter | | |

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

TRC Environmental Consultants, Inc.

# CHAIN OF CUSTODY RECORD

№ 4199

**PROJECT NO.** 12034-E71

**PROJECT NAME** RTP Associates

**SAMPLERS:** (Signature) [signature] Ray P

(Printed) DAVID PRATER, RAY POTTER

| FIELD SAMPLE NUMBER | DATE | TIME | COMP. | GRAB | STATION LOCATION | NO. OF CONTAINERS | VOST Analysis see attached sheet for compounds | | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-2-1 | 10NOV92 | | ✓ | | OUTLET | 1 | ✓ | | | | | | | FRONT |
| 0-2-2 | | | ✓ | | | | ✓ | | | | | | | BACK |
| 0-3-1 | | | ✓ | | | | ✓ | | | | | | | FRONT |
| 0-3-2 | | | ✓ | | | | ✓ | | | | | | | BACK |
| 0-4-1 | | | ✓ | | | | ✓ | | | | | | | FRONT |
| 0-4-2 | | | ✓ | | | | ✓ | | | | | | | BACK |
| 0-5-1 | | | ✓ | | | | ✓ | | | | | | | FRONT |
| 0-5-2 | | | ✓ | | | | ✓ | | | | | | | BACK |
| 0-6-1 | | | ✓ | | | | ✓ | | | | | | | FRONT |
| 0-6-2 | | | ✓ | | | | ✓ | | | | | | | BACK |
| 0-7-1 | | | ✓ | | | | ✓ | | | | | | | FRONT |
| 0-7-2 | | | ✓ | | | | ✓ | | | | | | | BACK |

| Relinquished by: (Signature) | Date / Time | Received by: (Signature) | Relinquished by: (Signature) | Date / Time | Received by: (Signature) |
|---|---|---|---|---|---|
| [signature] | 12NOV92 1400 | | | | |
| (Printed) DAVID A PRATER | | (Printed) | (Printed) | | (Printed) |

| Relinquished by: (Signature) | Date / Time | Received for Laboratory by: (Signature) | Date / Time | Remarks |
|---|---|---|---|---|
| | | [signature] | 11.13.92 11:00 | Flow on Front TRAP was in the Direction of the white DOT on Tube, white DOT was at Bottom. |
| (Printed) | | (Printed) Keven L. Fitzwalter | | |

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

ITC Environmental Consultants, Inc.

# CHAIN OF CUSTODY RECORD

№ 4200

| PROJECT NO. | PROJECT NAME |
|---|---|
| 12034-E71 | RTP Associates |

SAMPLERS: (Signature) [illegible]

(Printed) DAVID PRATER, RAY POTTER

PARAMETERS: VOST ANALYSIS; See attached sheet for compounds

| FIELD SAMPLE NUMBER | DATE | TIME | COMP. | GRAB | STATION LOCATION | NO. OF CONTAINERS | VOST ANALYSIS | | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-8-1 | 12Nov92 | | ✓ | | OUTLET | 1 | ✓ | | | | | | | FRONT |
| 0-8-2 | | | ✓ | | | | ✓ | | | | | | | BACK |
| 0-FB-1 | | | | | | | ✓ | | | | | | | FIELD BLANKS FRONT |
| 0-FB-2 | | | | | | | ✓ | | | | | | | FIELD BLANKS TRIP ~~Back~~ TAD |
| 0-9-1 | | | ✓ | | | | ✓ | | | | | | | FRONT |
| 0-9-2 | | | ✓ | | | | ✓ | | | | | | | BACK |
| 0-10-1 | | | ✓ | | | | ✓ | | | | | | | FRONT |
| 0-10-2 | | | ✓ | | | | ✓ | | | | | | | BACK |
| 0-11-1 | | | ✓ | | | | ✓ | | | | | | | FRONT |
| 0-11-2 | | | ✓ | | | | ✓ | | | | | | | BACK |
| 0-12-1 | | | ✓ | | | | ✓ | | | | | | | FRONT |
| 0-12-2 | | | ✓ | | | | ✓ | | | | | | | BACK |

| Relinquished by: (Signature) | Date / Time | Received by: (Signature) | Relinquished by: (Signature) | Date / Time | Received by: (Signature) |
|---|---|---|---|---|---|
| [illegible] | 12Nov92 / 1400 | | | | |
| (Printed) DAVID A. PRATER | | (Printed) | (Printed) | | (Printed) |

| Relinquished by: (Signature) | Date / Time | Received for Laboratory by: (Signature) | Date / Time | Remarks |
|---|---|---|---|---|
| | | [illegible] | 11-13-92 / 11:00 | FLOW ON FRONT TRAP WAS IN THE DIRECTION OF THE WHITE DOT ON TUBE, WHITE DOT WAS AT BOTTOM. |
| (Printed) | | (Printed) Leven L. Fitzwalter | | |

Distribution: Original Plus One Accompanies Shipment (white and yellow); Copy to Coordinator Field Files (pink).

# APPENDIX E

## EQUIPMENT CALIBRATIONS AND CALIBRATION GAS CERTIFICATIONS

## GASEOUS POLLUTANT MODULE CALIBRATION FORM

Date 11/12/92 Calibrated by Ed Santos Module Number 0106 (Pretest/Posttest)

Barometric Pressure, $P_b$ = 30.00 in. Hg Wet test meter number 16744

| WET TEST METER | | | ROTAMETER | DRY TEST METER | | | | |
|---|---|---|---|---|---|---|---|---|
| PRESSURE DROP $(D_m)^a$ In. $H_2O$ | GAS VOLUME $(V_w)^b$ $Ft^3$ | AVERAGE GAS TEMP. $(T_w)$ °F | ROTAMETER $(R_s)$ ℓ/min. | GAS VOLUME $(V_d)^b$ $Ft^3$ | AVERAGE GAS TEMPERATURE $T_d$ (°F) | TIME OF RUN $(\theta)^c$ min. | DGM CALIBRATION FACTOR $(Y_i)^d$ | ROTAMETER CALIBRATION FACTOR $(Y_{ri})^e$ |
| -.10 | .25 | 74.5 | .5 | .250 | 73 | ~~14.32~~ 14.33 | 0.997 | 0.992 |
| -.10 | .50 | 74.5 | .5 | .509 | 80 | 28.71 | 0.996 | 1.000 |
| -.15 | .25 | 75 | 1 | .260 | 84 | 7.21 | ES ~~0.983~~ .977 | 0.998 |
| -.15 | .50 | 75 | 1 | .517 | 84 | 14.45 | 0.983 | 0.996 |
| | | | | | | Average | 0.988 | 0.997 |

a $D_m$ expressed as negative number.

b Volume passing through meter. (5 Revolution Minimum)

c The time it takes to complete the calibration run.

d With Y defined as the average ratio of volumes for the wet test meter and the dry gas meter,

$Y_i = Y_{ave} \pm 0.02Y$ and $Y_{ave} = 1.00 \pm 0.01$ for the calibration or $Y_i \pm 0.05$ Y for the post-test checks, thus,

$$Y_i = \frac{V_w (T_d + 460°F)(P_b + (Dm/13.6))}{V_d (t_w + 460°F)(P_b)} \quad \text{(Eq. 1)} \qquad Y_{ave} = \frac{Y_1 + Y_2 + Y_3}{3} = \quad \text{(Eq. 2)}$$

e With $Y_r$ defined as the average ratio of volumetric measurement by wet test meter to rotameter. Tolerance $Y_r = 1 \pm 0.05$ for calibration and $Y \pm 0.1$ for the posttest checks.

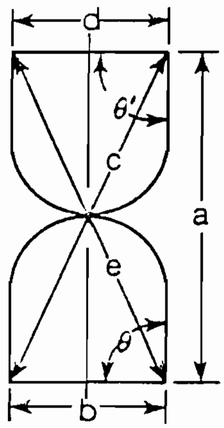
$$Y_{r_i} = \frac{V_w (T_d + 460°F)\left[P_b + (D_m/13.6)\right]}{\theta (t_w + 460°F)(P_b)(R_s)(0.0353)} \quad \text{(Eq. 3)} \qquad Y_r = \frac{Y_1 + Y_2 + Y_3}{3} = \_\_\_\_ . \quad \text{(Eq. 4)}$$

## S-TYPE PITOT GEOMETRIC CALIBRATION
## PART 2 - PITOT ALIGNMENT

Procedure No. T/S-811
Revision No. 1
Date December 9, 1980
Page ______ of ______

TRC Probe Identification P 32
Pitot Identification P-32
Technical Specialist C. J. Santos
Date 11/20/82

**A.** Transverse Tube Axis




a 1.134
b .384
c 1.167
d .385
e 1.131

$$\frac{a^2 + b^2 - c^2}{2ab} = \cos\theta$$

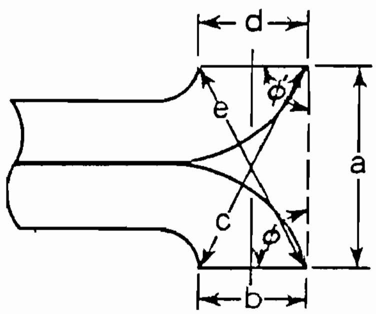
$$\frac{a^2 + d^2 - e^2}{2ad} = \cos\theta'$$

θ 84.
θ' 86.

($80° < \theta < 100°$)

($80° < \theta' < 100°$)

**B.** Longitudinal Tube Axis




a 1.130
b .500
c 1.237
d .545
e 1.224

$$\frac{a^2 + b^2 - c^2}{2ab} = \cos\phi$$

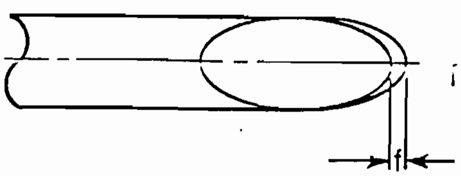
$$\frac{a^2 + d^2 - e^2}{2ad} = \cos\phi'$$

φ 89.1
φ' 86.

($85° < \phi < 95°$)

($85° < \phi' < 95°$)

**C.** (f < 1/8")




1.055

**D.** (g < 1/32")


g 0

*NOTE: Values in parentheses are EPA Method 2 specifications.*

PROBE THERMOCOUPLE CALIBRATION

TOLERANCES

°R = °F + 460

Thermocouple Identification TC-P32-1
Expected Stack Temperature ($T_s$) — °R
Reference Thermometer ($T_{ref}$) 73.4 °R ($T_s \pm 10\%$)
Thermocouple Readout 73.2 °R ($T_{ref} \pm 1.5\%$)

Technician Edward Kata Date 11/ /82
Reviewed By ______ Date ______

TRC
TRC Environmental Consultants, Inc.

FORM 811-2

# METHOD 5 MODULE CALIBRATION

ORIFICE/MODULE NO. D-5
BAROMETRIC PRESSURE ($P_b$) 29.93 in. Hg
DATE 9/9/92

DGM SERIAL NO. 621781
STANDARD METER P-697
NAME Ed Santos

| MODULE ORIFICE SETTING ΔH (in $H_2O$) | STANDARD METER VOLUME $V_s$ ($ft^3$) | STANDARD METER FACTOR $Y_s$ | STANDARD METER TEMPERATURE $t_s$ (°F) | STANDARD METER PRESSURE $\Delta P_s$ (in $H_2O$) | MODULE METER VOLUME $V_m$ ($ft^3$) | MODULE METER TEMPERATURE $t_{mi}$ (°F) | MODULE METER TEMPERATURE $t_{mo}$ (°F) | MODULE METER TIME θ (min.) | Y | ΔH@ (in $H_2O$) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.5 | 5 | 1 | 78.5 | -0.3 | 4.956 | 76 | 76 | 12.22 | 1.002 ✓ | 1.711 ✓ |
| 1.0 | 5 | 1 | 78.5 | -0.5 | 4.960 | 77 | 76 | 8.91 | 1.001 ✓ | 1.818 ✓ |
| 1.5 | 10 | 1 | 78 | -0.7 | 9.904 | 78 | 77 | 14.25 | 1.003 ✓ | 1.737 ✓ |
| 2.0 | 10 | 1 | 78 | -0.9 | 9.921 | 79 | 77 | 12.40 | 1.001 ✓ | 1.752 ✓ |
| 3.0 | 10 | 1 | 78 | -1.1 | 9.939 | 80 | 78 | 10.40 | .998 ✓ | 1.846 ✓ |
| | | | | | | | | AVERAGE | 1.001 ✓ | 1.773 ✓ |

FOR CHECK, USE THE AVERAGE ΔH@ FOR ΔH:

$$Y = \frac{V_s \left(P_b + \frac{P_s}{13.6}\right)(t_m + 460)\, Y_s}{V_m \left(P_b + \frac{\Delta H}{13.6}\right)(t_s + 460)}$$

$$\Delta H@ = \left[\frac{(0.0317)\,\Delta H}{P_b\,(t_m + 460)}\right]\left[\frac{(t_s + 460)\,\theta}{V_s\, t_s}\right]^2$$

ACCEPTANCE CRITERIA:

Each Y must be 1.00 ± 0.01

Average ΔH@ must be 1.84 ± 0.25

Each ΔH@ must be within 0.15 of the average ΔH@

TC Readout Calibrated with Constant Voltage Source ______
$t_{mi}$ ______ °F $t_{mo}$ ______ °F Reference Thermometer ______ °F
Module Leak Check ✓
Heater Box Control OK ✓
Probe Heater Control ______
Module Cleaned ✓
Pitot Tube Manometer Leak Check ✓

Calibrated and Checked by Ed Santos Date 9/9/92
Reviewed by Bruce A. Holt Date 9/15/92

D-5



# METHOD 5 MODULE CALIBRATION

| MODULE ORIFICE SETTING ΔH (in Hg) | STANDARD METER | | DRY GAS METER | |
|---|---|---|---|---|
| | $VOL_{Final}$ | $VOL_{Initial}$ | $VOL_{Final}$ | $VOL_{Initial}$ |
| 0.5 | | | 962.490 | 957.534 |
| 1.0 | | | 967.450 | 962.490 |
| 1.5 | | | 977.354 | 967.450 |
| 2.0 | | | 987.275 | 977.354 |
| 3.0 | | | 997.214 | 987.275 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Operator Ed Santos

Date 9/9/92

Status (Circle One): Green Red

Was Any Maintenance Performed (Circle One): Yes No

If Yes, Please Describe in Detail Below:

# METHOD 5 MODULE CALIBRATION

ORIFICE/MODULE NO. D-5

BAROMETRIC PRESSURE ($P_b$) 29.62 in. Hg

DATE 12/7/92

DGM SERIAL NO. 621781

STANDARD METER 16744

NAME Ed Santos

| MODULE ORIFICE SETTING $\Delta H$ (in $H_2O$) | STANDARD METER VOLUME $V_s$ ($ft^3$) | STANDARD METER FACTOR $Y_s$ | STANDARD METER TEMPERATURE $t_s$ (°F) | STANDARD METER PRESSURE $\Delta P_s$ (in $H_2O$) | MODULE METER VOLUME $V_m$ ($ft^3$) | MODULE METER TEMPERATURE $t_{mi}$ (°F) | MODULE METER TEMPERATURE $t_{mo}$ (°F) | MODULE METER TIME $\theta$ (min.) | Y | $\Delta H@$ (in $H_2O$) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.5 | 5 | 1 | 74.5 | -0.54 | 5.021 | 75 | 75 | 12.44 | 0.9[illegible] | 1.7[illegible] |
| 1.0 | 5 | 1 | 74 | -0.84 | 5.015 | 75 | 75 | 8.49 | 0.994 | 1.845 |
| 1.5 | 10 | 1 | 75 | -1.24 | 10.034 | 76 | 75 | 14.40 | 0.991 | 1.771 |
| 2.0 | 10 | 1 | 75 | -1.52 | 10.013 | 76 | 76 | 12.51 | 0.992 | 1.789 |
| 3.0 | 10 | 1 | 75 | -2.0 | 10.007 | 77 | 76 | 10.48 | 0.990 | 1.881 |
| | | | | | | | | AVERAGE | 0.992 | 1.815 |

FOR CHECK, USE THE AVERAGE $\Delta H@$ FOR $\Delta H$:

$$Y = \frac{V_s \left(P_b + \frac{P_s}{13.6}\right)(t_m + 460)\, Y_s}{V_m \left(P_b + \frac{\Delta H}{13.6}\right)(t_s + 460)}$$

$$\Delta H@ = \left[\frac{(0.0317)\,\Delta H}{P_b\,(t_m + 460)}\right]\left[\frac{(t_s + 460)\,\theta}{V_s\, t_s}\right]^2$$

ACCEPTANCE CRITERIA:

Each Y must be 1.00 ± 0.01

Average $\Delta H@$ must be 1.84 ± 0.25

Each $\Delta H@$ must be within 0.15 of the average $\Delta H@$

TC Readout Calibrated with Constant Voltage Source ______

$t_{mi}$ ______ °F $t_{mo}$ ______ °F Reference Thermometer ______ °F

Module Leak Check ✓

Heater Box Control OK ______

Probe Heater Control ✓

Module Cleaned ✓

Pitot Tube Manometer Leak Check ______

Calibrated and Checked by Edward [signature] Date 12/7/92

Reviewed by [signature] Date 12/22/92

5/3/83 - Rev. 12/91

TRC Environmental Consultants, Inc.

D-5

# METHOD 5 MODULE CALIBRATION

| MODULE ORIFICE SETTING ΔH (in Hg) | STANDARD METER | | DRY GAS METER | |
|---|---|---|---|---|
| | $VOL_{Final}$ | $VOL_{Initial}$ | $VOL_{Final}$ | $VOL_{Initial}$ |
| ~~1.5~~ | | | ~~189.408~~ | ~~179.350~~ |
| 2.0 | | | 199.456 | 189.408 |
| ~~3.0~~ | | | ~~210.140~~ | ~~200.212~~ |
| ~~5.0~~ | | | ~~220.197~~ | ~~210.140~~ |
| 1.0 | | | 244.560 | 239.545 |
| 0.5 | | | 249.581 | 244.560 |
| 1.5 | | | 259.615 | 249.581 |
| 2.0 | | | 269.628 | 259.615 |
| 3.0 | | | 279.635 | 269.628 |
| | | | | |

Operator E. Santos    Date 12/7/92

Status (Circle One): Green Red

Was Any Maintenance Performed (Circle One): Yes No

If Yes, Please Describe in Detail Below:

Had a small leak in outlet of DGM - Recorded connector with Teflon Tape and Gasket sealant.



TRC

TRC Environmental Consultants, Inc.

Scott Specialty Gases, Inc.

Shipped From: 2330 HAMILTON BOULEVARD SOUTH PLAINFIELD NJ 07080-0000
Phone: 908-754-7700 Fax: 908-754-7303

# CERTIFICATE OF ANALYSIS

TRC ENVIRONMENTAL
MISSION MEASURING
5 WATERSIDE CROSSING
RECEIVING DEPARTMENT
~~EAST HARTFORD~~ WINDSOR CT 06095

PROJECT #: 07-13436
PO#: 21751
ITEM #: 07023411 44L
DATE: 12/30/91

CYLINDER #: ALM026985 ANALYTICAL ACCURACY: +/- 2%

| COMPONENT | REQUESTED GAS CONC MOLES | | ANALYSIS (MOLES) | |
|---|---|---|---|---|
| PROPANE | 9. | PPM | 9.16 | PPM |
| AIR | | BAL | | BAL |

AIR/HC FREE

ANALYST: ADELA SY APPROVED BY: DONALD DUDICS

# Scott Specialty Gases, Inc.

Shipped From: 2330 HAMILTON BOULEVARD SOUTH PLAINFIELD NJ 07080-0000
Phone: 906-754-7700 Fax: 908-754-7303

## C E R T I F I C A T E   O F   A N A L Y S I S

TRC ENVIRONMENTAL
MISSION MEASURING
5 WATERSIDE CROSSING
RECEIVING DEPARTMENT
~~EAST HARTFORD~~ WINDSOR CT 06095

PROJECT #: 07-13436
PO#: 21751
ITEM #: 07023411 4AL
DATE: 12/30/91

CYLINDER #: ALM026970 ANALYTICAL ACCURACY: +/- 2%

| COMPONENT | REQUESTED GAS CONC MOLES | | ANALYSIS (MOLES) | |
|---|---|---|---|---|
| PROPANE | 90. | PPM | 91.1 | PPM |
| AIR | | BAL | | BAL |

AIR/HC FREE

ANALYST: ADELA SY APPROVED BY: DONALD DUDICS

# Scott Spec alty Gases

2330 Hamilton Blvd South Plainfield NJ
PHONE 908-754-7700 FAX 308-754-7303

## CERTIFICATION OF ANALYSIS-EPA PROTOCOL

Date Shipped 07-20-1992 Our Project 0716175 Your P.O. 22436
certified per Protocol#1 Procedure 3.0.4-G1 Top Pressure 2000psig
cylinder # ALM027504

| | | REFERENCE STD | | | GAS ANALYZER | | |
|---|---|---|---|---|---|---|---|
| MINOR comp. | CERT. conc. | CRM/SRM num | CYL. num | STD conc. | MAKE/ model | LAST cal. | ANAL prin. |
| Nitric Oxide | 94.2ppm+/-1% | 1684 | ALM13354 | 95.26 ppm | TECO-10S-28404 | 225-5/15/92- | Chemluminescence |

BALANCE Nitrogen o2 free EXPIRES 1-15-1994

*ANALYZER READINGS*

| ***Component*** | ***First Analysis*** | | | ***Second Analysis*** | | |
|---|---|---|---|---|---|---|
| *Nitric Oxide* | *Date: 07-08-1992* | *Mean test assay 94.1* | | *Date: 07-15-1992* | *Mean test assay 94.2* | |
| *all values as ppm* | *Zero= 0* | *Ref.= 95.26* | *Test=94* | *Zero= 0* | *Ref.= 95.26* | *Test=94.2* |
| | *Ref.= 95.26* | *Zero= 0* | *Test=94* | *Ref= 95.26* | *Zero= 0* | *test=94.2* |
| | *Zero= 0* | *Test=94.3* | *Ref.= 95.26* | *Zero= 0* | *Test= 94.2* | *Ref.= 95.26* |

E-17

ANALYST ______ Adela Sy

APPROVED BY ______ John O'shea

# Scott Specialty Gases, Inc.

E. P. A. PROTOCOL CERTIFICATE OF ANALYSIS

Shipped from:
Scott Specialty Gases
Route 611
Plumsteadville, PA 18949
Purchase order :
22436

Shipped to:
TRC ENVIRONMENTAL
5 WATERSIDE CROSSING
RECEIVING DEPARTMENT
WINDSOR, CT 06095
ATTN: PO 22436
Project No 39260

Certified per E.P.A. Protocol # 1 Procedure #G1 Section # 3.0.4
Certified accuracy +/- 1 % NIST Traceable

Cylinder number ALM029356 Cylinder pressure 2000 psig. Date of assay: 7-8-92

| Component | Certified concentration | |
|---|---|---|
| NITRIC OXIDE | 42.3 ppm | Expiration date: 1-8-94 |
| OXIDES OF NITROGEN | 42.4 | |
| NITROGEN | Balance | |

| Standard | | Analyzer | |
|---|---|---|---|
| Type | GMIS | Make | : TECO |
| Concentration | 50.77 ppm | Model | : 10 |
| Cylinder # | AAL21490 | Serial number | : 9741-111-S |
| | | Analytical principle | : Chemiluminesence |
| | | Date of calibration | : 6-22-92 |

| Raw data units: | | VOLTS | Concentration of Customer Cylinder |
|---|---|---|---|
| First analysis | | 6-29-92 | |
| Z1=0.0000 | R1=0.49680 | T1=0.41520 | 42.4 ppm |
| R2=0.49840 | Z2=0.0000 | T2=0.41530 | 42.3 ppm |
| Z3=0.0000 | T3=0.41580 | R3=0.49680 | 42.4 ppm |
| Second analysis: | | 7-8-92 | |
| Z1=0.0000 | R1=0.46220 | T1=0.38590 | 42.4 ppm |
| R2=0.46490 | Z2=0.0000 | T2=0.38550 | 42.1 ppm |
| Z3=0.0000 | T3=0.38600 | R3=0.46550 | 42.2 ppm |

Analyst Al Rojas

Approved by [signature]
Mark S. Sirinides/Ted Neeme

# Scott Specialty Gases

2330 Hamilton Blvd South Plainfield NJ
PHONE 908-754-7700 FAX 908-754-7303

## CERTIFICATION OF ANALYSIS-EPA PROTOCOL

Date Shipped 04-06-1992 Our Project 0714691 Your P.O. 22055
certified per Protocol#1 Procedure 3.0.4-G1 Top Pressure 2000psig
cylinder # ALM018076

| MINOR comp. | CERT. conc. | REFERENCE STD CRM/SRM num | CYL. num | STD conc. | GAS ANALYZER MAKE/ model | LAST cal. | ANAL prin. |
|---|---|---|---|---|---|---|---|
| Carbon Monoxide | 55.5ppm+/-1% | 1678 | AAL5973 | 47.2 ppm | Ecolyzer 2000-1709- | 2/1/92- | Electrochemical |
| Oxygen | 14.1%+/-1% | 2659 | AAL18592 | 20.66 % | Varian-3700-31608928- | 3/14/92- | GC TCD |

BALANCE Nitrogen EXPIRES 10-06-1993

*ANALYZER READINGS*

| *Component* | *First Analysis* | | | *Second Analysis* | | |
|---|---|---|---|---|---|---|
| *Carbon Monoxide* | *Date: 03-30-1992Mean test assay 55.3* | | | *Date: 04-06-1992Mean test assay 55.6* | | |
| *all values as ppm* | *Zero= 0* | *Ref.= 47.2* | *Test=55.3* | *Zero= 0* | *Ref.= 47.2* | *Test=55.6* |
| | *Ref.= 47.2* | *Zero= 0* | *Test=55.3* | *Ref= 47.2* | *Zero= 0* | *Test=55.6* |
| | *Zero= 0* | *Test=55.3* | *Ref.= 47.2* | *Zero= 0* | *Test= 55.6* | *Ref.= 47.2* |
| *Oxygen* | *Date: 04-06-1992Mean test assay 14.1* | | | | | |
| *all values as %* | *Zero= 0* | *Ref.= 20.66* | *Test=14.1* | | | |
| | *Ref.= 20.66* | *Zero= 0* | *Test=14.1* | | | |
| | *Zero= 0* | *Test=14.1* | *Ref.= 20.66* | | | |

ANALYST ______________ Adela Sy

APPROVED BY ______________ John O'shea

# Scott Specialty Gases

233C Hamilton Blvd South Plainfield NJ
PHONE 908-754-7700 FAX 908-754-7303

## CERTIFICATION OF ANALYSIS-EPA PROTOCOL

Date Shipped 04-06-1992 Our Project 0714691 Your P.O. 22055
certified per Protocol#1 Procedure 3.0.4-G1 Top Pressure 2000psig
cylinder # ALM006784

| | | REFERENCE STD | | | GAS ANALYZER | | |
|---|---|---|---|---|---|---|---|
| MINOR comp. | CERT. conc. | CRM/SRM num | CYL. num | STD conc. | MAKE/ model | LAST cal. | ANAL prin. |
| Carbon Monoxide | 25.5ppm+/-1% | 2635 | CAL7100 | 24.3 ppm | Ecolyzer 2000-1709-2/1/92-Electrochemical | | |
| Oxygen | 6.02%+/-1% | 2658 | AAL18568 | 10.08 % | Varian-3700-31608928-3/14/92-GC TCD | | |

BALANCE Nitrogen EXPIRES 10-06-1993

*ANALYZER READINGS*

| *Component* | *First Analysis* | | | *Second Analysis* | | |
|---|---|---|---|---|---|---|
| *Carbon Monoxide* | *Date: 03-03-1992Mean test assay 25.3* | | | *Date: 04-06-1992Mean test assay 25.6* | | |
| *all values as ppm* | *Zero= 0* | *Ref.= 24.3* | *Test=25.3* | *Zero= 0* | *Ref.= 24.3* | *Test=25.6* |
| | *Ref.= 24.3* | *Zero= 0* | *Test=25.3* | *Ref= 24.3* | *Zero= 0* | *Test=25.6* |
| | *Zero= 0* | *Test=25.3* | *Ref.= 24.3* | *Zero= 0* | *Test= 25.6* | *Ref.= 24.3* |
| *Oxygen* | *Date: 04-06-1992Mean test assay 6.02* | | | | | |
| *all values as %* | *Zero= 0* | *Ref.= 10.08* | *Test=6.05* | | | |
| | *Ref.= 10.08* | *Zero= 0* | *Test=5.98* | | | |
| | *Zero= 0* | *Test=6.04* | *Ref.= 10.08* | | | |

ANALYST ________ Adela Sy

APPROVED BY ________ John O'shea

DETERMINATION, AND ANALYSIS VALIDATION

FIRM RTP

T NUMBER gas bottle [illegible] - ALM027929

SAMPLING TIME (24-hr CLOCK) NA

PLING LOCATION NA

SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) bottle

PLE MOISTURE CONTENT NA %

IENT TEMPERATURE 72

TESTER/DATE RDD 11-6-92

An ORSAT analysis of boiler exhaust gases is considered valid if the $F_o$ calculated from the ORSAT analysis is within ±5% of the $F_o$ calculated from fuel analysis. If fuel analysis data is not available, the $F_o$ calculated from the ORSAT analysis must be within ±5% of the average published $F_o$ for a given fuel as follows:

| FUEL | AVE. $F_o$ | ±5% ACCEPTANCE LIMITS |
|---|---|---|
| Anthracite | 1.070 | 1.016 - 1.124 |
| Bituminous | 1.140 | 1.083 - 1.197 |
| Lignite | 1.076 | 1.022 - 1.130 |
| Oil | 1.346 | 1.279 - 1.413 |
| Natural Gas | 1.749 | 1.662 - 1.836 |
| Propane | 1.510 | 1.434 - 1.586 |
| Butane | 1.479 | 1.405 - 1.553 |
| Wood | 1.050 | 0.9975- 1.102 |
| Bark | 1.056 | 1.003 - 1.109 |

## PRE-TEST ORSAT EQUIPMENT CHECK

ORSAT CHECK: PRE-TEST LEAK CHECK: INITIAL ____ ml 0 min.
ACCEPTANCE LIMIT: LEAK < 0.2 ml/5 min. FINAL ____ ml 5 min.
PRE-TEST AMBIENT $O_2$ = ____%; ACCEPTANCE LIMITS OF $O_2$ = 20.6 - 21.2%

## MOLECULAR WEIGHT DETERMINATION

| RUN / S | 1 ACTUAL READING (ml) | 1 % | 2 ACTUAL READING (ml) | 2 % | 3 ACTUAL READING (ml) | 3 % | AVERAGE % | MULTIPLIER | CONTRIBUTION TO DRY MOLECULAR WEIGHT OF STACK GAS $M_{di}$ lb/lb-mole |
|---|---|---|---|---|---|---|---|---|---|
| 2 | 79 | 21 | 79 | 21 | 79.5 | 20.5 | 20.8 | 44/100 | |
| $O_2$ | 76 | 3 | 76 | 3 | 76 | 3.5 | 3.2 | 32/100 | |
| | | | | | | | | 28/100 | |
| | | | | | | | | 28/100 | |

$$= \frac{M_d\ (100 - \%\ H_2O) + 18\ (\%\ H_2O)}{100} = \_\_\_\_\_\_$$

$$M_d = \sum M_{di} = \_\_\_\_\_\_$$

FOR F-FACTOR CALCULATIONS ALL ORSAT ANALYSES MUST BE RUN IN TRIPLICATE AND MUST AGREE WITH EACH OTHER TO WITHIN 0.3% BY VOLUME

## POST-TEST ORSAT EQUIPMENT CHECK

ORSAT CHECK: POST-TEST LEAK CHECK: INITIAL ____ ml 0 min.
ACCEPTANCE LIMIT: LEAK < 0.2 ml/5 min. FINAL ____ ml 5 min.
POST-TEST AMBIENT $O_2$ = ____%; ACCEPTANCE LIMITS OF $O_2$ = 20.6 - 21.2%

## ORSAT ANALYSIS VALIDATION

Average Published $F_o$ = ______

Fuel Analysis $F_o = \dfrac{20.9\ (1.53\ \%C + 3.64\ \%H + 0.57\ \%S + 0.14\ \%N - 0.46\ \%O)}{0.321\ \%C\ (100)} =$ ______

ORSAT Analysis $F_o^* = \dfrac{20.9 - \%\ O_2}{\%\ CO_2} =$ ______, Acceptance Limits are shown above.

*Assuming CO concentration is neglible (< 1000 ppm)

# Scott Specialty Gases

2330 Hamilton Blvd South Plainfield NJ
PHONE 908-754-7700 FAX 908-754-7303

## CERTIFICATION OF ANALYSIS-EPA PROTOCOL

Date Shipped 07-07-1992 Our Project 0716175 Your P.O. 22436
certified per Protocol#1 Procedure 3.0.4-G1 Top Pressure 2000psig
cylinder # 1L3091

| | | REFERENCE STD | | | GAS ANALYZER | | |
|---|---|---|---|---|---|---|---|
| MINOR comp. | CERT. conc. | CRM/SRM num | CYL. num | STD conc. | MAKE/ model | LAST cal. | ANAL prin. |
| Carbon Monoxide | 96.6ppm+/-1% | 1679 | ALM10480 | 96.7 ppm | Per.Elm.-Sigma 2000-094331001115-4/15/92-GC FID | | |

BALANCE Nitrogen EXPIRES 1-07-1994

*ANALYZER READINGS*

| *Component* | *First Analysis* | | | *Second Analysis* | | |
|---|---|---|---|---|---|---|
| *Carbon Monoxide* | *Date: 06-30-1992Mean test assay 96.6* | | | *Date: 07-07-1992Mean test assay 96.5* | | |
| *all values as ppm* | *Zero= 0* | *Ref.= 96.7* | *Test=96.6* | *Zero= 0* | *Ref.= 96.7* | *Test=96.5* |
| | *Ref.= 96.7* | *Zero= 0* | *Test=96.6* | *Ref= 96.7* | *Zero= 0* | *test=96.5* |
| | *Zero= 0* | *Test=96.7* | *Ref.= 96.7* | *Zero= 0* | *Test= 96.5* | *Ref.= 96.7* |

ANALYST ____________ John O'shea

APPROVED BY ____________ Adela Sy

DETERMINATION, AND ANALYSIS VALIDATION

FIRM RTP

TEST NUMBER gas bottle audit - ALM022375

SAMPLING TIME (24-hr CLOCK) NA

SAMPLING LOCATION NA

SAMPLE TYPE (BAG, INTEGRATED, CONTINUOUS) bottle

SAMPLE MOISTURE CONTENT NA %

AMBIENT TEMPERATURE 72

TESTER/DATE RDP 11-6-92

An ORSAT analysis of boiler exhaust gases is considered valid if the $F_o$ calculated from the ORSAT analysis is within ±5% of the $F_o$ calculated from fuel analysis. If fuel analysis data is not available, the $F_o$ calculated from the ORSAT analysis must be within ±5% of the average published $F_o$ for a given fuel as follows:

| FUEL | AVE. $F_o$ | ±5% ACCEPTANCE LIMITS |
|---|---|---|
| Anthracite | 1.070 | 1.016 - 1.124 |
| Bituminous | 1.140 | 1.083 - 1.197 |
| Lignite | 1.076 | 1.022 - 1.130 |
| Oil | 1.346 | 1.279 - 1.413 |
| Natural Gas | 1.749 | 1.662 - 1.836 |
| Propane | 1.510 | 1.434 - 1.586 |
| Butane | 1.479 | 1.405 - 1.553 |
| Wood | 1.050 | 0.9975- 1.102 |
| Bark | 1.056 | 1.003 - 1.109 |

## PRE-TEST ORSAT EQUIPMENT CHECK

ORSAT CHECK: PRE-TEST LEAK CHECK: INITIAL _____ ml __0__ min.
ACCEPTANCE LIMIT: LEAK < 0.2 ml/5 min. FINAL _____ ml __5__ min.
PRE-TEST AMBIENT $O_2$ = _____%; ACCEPTANCE LIMITS OF $O_2$ = 20.6 - 21.2%

## MOLECULAR WEIGHT DETERMINATION

| RUN / GAS | 1 ACTUAL READING (ml) | 1 % | 2 ACTUAL READING (ml) | 2 % | 3 ACTUAL READING (ml) | 3 % | AVERAGE % | MULTIPLIER | CONTRIBUTION TO DRY MOLECULAR WEIGHT OF STACK GAS $M_{di}$ lb/lb-mole |
|---|---|---|---|---|---|---|---|---|---|
| $CO_2$ | 96 | 4 | 97 | ~~4~~ 3 | 97 | 3 | 3.33 | 44/100 | |
| $O_2$ | 75 | 21 | 76 | 21 | 76 | 21 | 21.0 | 32/100 | |
| CO | | | | | | | | 28/100 | |
| $N_2$ | | | | | | | | 28/100 | |

$$M_w = \frac{M_d\ (100 - \%\ H_2O) + 18\ (\%\ H_2O)}{100} = \_\_\_\_\_\_$$

$$M_d = \sum M_{di} = \_\_\_\_\_\_$$

FOR F-FACTOR CALCULATIONS ALL ORSAT ANALYSES MUST BE RUN IN TRIPLICATE AND MUST AGREE WITH EACH OTHER TO WITHIN 0.3% BY VOLUME

## POST-TEST ORSAT EQUIPMENT CHECK

ORSAT CHECK: POST-TEST LEAK CHECK: INITIAL _____ ml __0__ min.
ACCEPTANCE LIMIT: LEAK < 0.2 ml/5 min. FINAL _____ ml __5__ min.
POST-TEST AMBIENT $O_2$ = _____%; ACCEPTANCE LIMITS OF $O_2$ = 20.6 - 21.2%

## ORSAT ANALYSIS VALIDATION

Average Published $F_o$ = __________

Fuel Analysis $F_o = \frac{20.9\ (1.53\ \%C + 3.64\ \%H + 0.57\ \%S + 0.14\ \%N - 0.46\ \%O)}{0.321\ \%C\ (100)}$ = __________

ORSAT Analysis $F_o^* = \frac{20.9 - \%\ O_2}{\%\ CO_2}$ = __________, Acceptance Limits are shown above.

*Assuming CO concentration is neglible (< 1000 ppm)

Revision 3 2/8/83

## REFERENCES


Lockwood, Kessler & Bartlett, Inc., August 31, 1979. Old Bethpage Landfill, Fireman's Training Center, % Combustible Gas, Sampling Data Summary. Submitted to: Town of Oyster Bay, Syosset, New York.

Lockwood, Kessler & Bartlett, Inc., December 1, 1979. Land Use Plan, Old Bethpage Landfill. Submitted to: Town of Oyster Bay, Syosset, New York.

Lockwood, Kessler & Bartlett, Inc., June 13, 1980. Preliminary Engineering Design Report; Phase 1 Gas Control and Recovery Program. Submitted to: Town of Oyster Bay, Syosset, New York.

Lockwood, Kessler & Bartlett, Inc., January 29, 1981. Old Bethpage Landfill, Fireman's Training Center, % Combustible Gas, Sampling Data Summary. Submitted to: Town of Oyster Bay, Syosset, New York.

Lockwood, Kessler & Bartlett, Inc., October 1983. Comprehensive Land Use and Operations Plan. Submitted to: Town of Oyster Bay, Syosset, New York.

Lockwood, Kessler & Bartlett, Inc., April 1987. 1986 Annual Report Summarizing the Status of Landfill Gas Monitoring Programs and the Establishment of the Zero Percent Gas Migration Limitation at the Old Bethpage Landfill. Submitted to: Town of Oyster Bay, Syosset, New York.

Malcolm Pirnie, Inc., November 1988. Town of Oyster Bay/Fireman's Training Center Subsurface Gas Sampling Program Work Scope. Submitted to: Fire Service Academy, Town of Oyster Bay, Nassau County, New York.

Lockwood, Kessler & Bartlett, Inc., June, 1992. 1991 Annual Report Summarizing the Results of Landfill Gas Monitoring Programs At The Old Bethpage Solid Waste Disposal Complex and Adjacent Areas submitted to: Town of Oyster Bay, Syosset, New York.