Facultatieve Technologies

Cremation & Incineration Equipment

West Virginia Department of Environmental Protection

Division of Air Quality

Leavitt Funeral Home, Inc.

403 Seventh Street

Parkersburg, West Virginia

LEAVITT FUNERAL SERVICES and CREMATORY

LEAVITT
FUNERAL SERVICES
and CREMATORY

Caring for families. Celebrating lives.

July 29, 2015

Ms. Beverly D. McKeome
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street SE
Charleston, WV 25304

RE: Application for NSR Permit
Leavitt Funeral Home, Inc.
Parkersburg, West Virginia

Dear Ms. McKeome;

Please find enclosed the Application for NSR Permit for Leavitt Funeral Home, Inc. located at 403 Seventh Street, Parkersburg, WV. This permit is for a relocation of the current permit as we are planning on building a new facility at 414 Seventh Street, Parkersburg, West Virginia with a new human cremation system from Facultatieve Technologies. Upon installation and commissioning of the new system, we will take the old human Facultatieve Technologies cremator (DAQ ID No. 10700131) located at 2711 Camden Avenue, Parkersburg, WV offline. Our new crematory with the Facultatieve Technologies FT II cremator uses greatly advanced technology for cremation including a vast reduction in the use of fossil fuels, thus the reduction of emissions to the environment, reduction of cremation times and increased health and safety protection for our employees, our most valued asset offering BACT.

Our representative from Facultatieve Technologies, Mr. Ernie Kassoff has provided us with this manual which has all items required for the application. The package contains all items as directed in the Application for NSR Permit, index with tabs for easy reference. In addition, Mr. Kassoff has supplied within this package an emissions report from a similar unit that is currently operational. We will assume that we have provided all of the necessary information you require to complete the engineering evaluation and issue a permit for this modification. We have enclosed our permit fee and one (1) hard copy and two (2) electronic copies of the permit application as directed.

Please feel free to contact me with any questions regarding our site or Mr. Kassoff with technical questions. He can be reached via:
cell phone 330.242.6901
email: ernie.kassoff@facultatieve-technologies-usa.com

Best regards,

Jonathan C. Leavitt
President
Leavitt Funeral Home, Inc.

Jon Leavitt, *Owner*
Licensee-In-Charge
Stephen Leavitt, *Owner*
Dana A. Fouss, *Manager*

403 7th Street
Parkersburg, WV 26101
Phone: (304) 422-6459
Fax: (304) 422-4313

801 Victor Street
Belpre, OH 45714
Phone: (740) 423-6326
Fax: (740) 423-6337

www.LeavittFuneralHome.com

SELECTED Independent FUNERAL HOMES Member by Invitation

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West Virginia Department of Environmental Protection
Division of Air Quality

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Section I

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☐ **CONSTRUCTION** ☐ **MODIFICATION** ☒ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):* Leavitt Funeral Home, Inc.

2. Federal Employer ID No. ***(FEIN):*** 55-0366805

3. Name of facility *(if different from above):*

4. The applicant is the:
☒ **OWNER** ☐ **OPERATOR** ☐ **BOTH**

5A. Applicant's mailing address: 403 Seventh Street, Parkersburg, WV 26101

5B. Facility's present physical address: 414 Seventh Street, Parkersburg, WV 26101

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

➪ If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**

➪ If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation:

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**

➪ If **YES,** please explain: Owns Property

➪ If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Human Crematory

10. North American Industry Classification System **(NAICS)** code for the facility: 812210

11A. DAQ Plant ID No. (for existing facilities only): 10700131

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

From I-50 exit Division Street/WV-14/WV-95 toward Camden Avenue - turn right onto Avery Street - turn right onto 7th street - 414 7th Street is on the right side.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
414 Seventh Street	Parkersburg	Wood
12.E. UTM Northing (KM): 4346380.07	12F. UTM Easting (KM): 451924.46	12G. UTM Zone: 17S

13. Briefly describe the proposed change(s) at the facility:

New building to house new human crematory

14A. Provide the date of anticipated installation or change: 11/ 01 / 2015

- If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /

14B. Date of anticipated Start-Up if a permit is granted: 11 / 15 / 2015

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
24 Hours Per Day 7 Days Per Week 52 Weeks Per Year

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18**. Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13). Check in the amount of $1,000.00 attached to this application

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**
- Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**
- Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

➪ For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations
☐ Chemical Processes
☐ Concrete Batch Plant
☐ Grey Iron and Steel Foundry
☐ General Emission Unit, specify
☐ Haul Road Emissions
☐ Hot Mix Asphalt Plant
☒ Incinerator
☐ Indirect Heat Exchanger
☐ Quarry
☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Storage Tanks

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems
☐ Adsorption Systems
☒ Afterburner
☐ Baghouse
☐ Condenser
☐ Electrostatic Precipitator
☐ Flare
☐ Mechanical Collector
☐ Wet Collecting System
☐ Other Collectors, specify

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's "***Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below:

☐ Authority of Corporation or Other Business Entity
☐ Authority of Governmental Agency
☐ Authority of Partnership
☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE Jonathan C. Leavitt *(Please use blue ink)* DATE: 8/26/15 *(Please use blue ink)*

35B. Printed name of signee: Jonathan C. Leavitt		35C. Title: President
35D. E-mail: jon@leavittfuneralhome.com	36E. Phone: 304-422-6459	36F. FAX: 304-422-4313
36A. Printed name of contact person (if different from above):		36B. Title:
36C. E-mail:	36D. Phone:	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ **Attachment A: Business Certificate**
- ☒ **Attachment B: Map(s)**
- ☒ **Attachment C: Installation and Start Up Schedule**
- ☐ **Attachment D: Regulatory Discussion**
- ☒ **Attachment E: Plot Plan**
- ☒ **Attachment F: Detailed Process Flow Diagram(s)**
- ☒ **Attachment G: Process Description**
- ☐ **Attachment H: Material Safety Data Sheets (MSDS)**
- ☒ **Attachment I: Emission Units Table**
- ☒ **Attachment J: Emission Points Data Summary Sheet**
- ☒ **Attachment K: Fugitive Emissions Data Summary Sheet**
- ☒ **Attachment L: Emissions Unit Data Sheet(s)**
- ☐ **Attachment M: Air Pollution Control Device Sheet(s)**
- ☒ **Attachment N: Supporting Emissions Calculations**
- ☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
- ☒ **Attachment P: Public Notice**
- ☐ **Attachment Q: Business Confidential Claims**
- ☐ **Attachment R: Authority Forms**
- ☐ **Attachment S: Title V Permit Revision Information**
- ☒ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

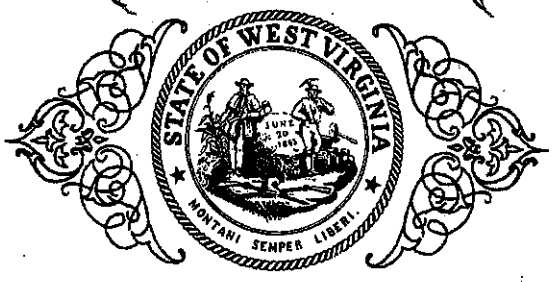
- ☐ ***Forward 1 copy of the application to the Title V Permitting Group and:***
- ☐ ***For Title V Administrative Amendments:***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit,***
- ☐ ***For Title V Minor Modifications:***
  - ☐ ***Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
- ☐ ***For Title V Significant Modifications processed in parallel with NSR Permit revision:***
  - ☐ ***NSR permit writer should notify a Title V permit writer of draft permit,***
  - ☐ ***Public notice should reference both 45CSR13 and Title V permits,***
  - ☐ ***EPA has 45 day review period of a draft permit.***

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

Section 2

BOOK 50 PAGE 556

State of West Virginia



Certificate

I, Ken Hechter, Secretary of State of the State of West Virginia, hereby certify that

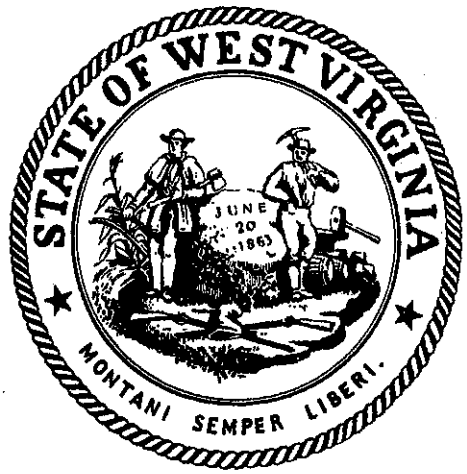
originals of the Articles of Amendment to the Articles of Incorporation of

LEAVITT FUNERAL HOME, INC.

are filed in my office, signed and verified, as required by the provisions of Chapter 31, Article 1, Section 31 of the West Virginia Code and conform to law. Therefore, I issue this

CERTIFICATE OF AMENDMENT TO THE ARTICLES OF INCORPORATION

of the corporation, to which I have attached a duplicate original of the Articles of Amendment.



Given under my hand and the Great Seal of the State of West Virginia on

March 8, 2000

Ken Hechter

Secretary of State

FILED
MAR 08 2000
IN THE OFFICE OF
SECRETARY OF STATE
WEST VIRGINIA

Filed in the Office of
Secretary of State of West Virginia
this date: _____

Articles filed in Duplicate Originals
Certificate Fee: $5.00
License Tax: _____

ARTICLES OF AMENDMENT

to

ARTICLES OF INCORPORATION

of

LEAVITT FUNERAL HOME, INC.

Pursuant to the provisions of Section 31, Article 1, Chapter 31 of the Code of West Virginia, the undersigned corporation adopts the following Articles of Amendment to its Articles of Incorporation:

FIRST: The name of the corporation is Leavitt Funeral Home, Inc.

SECOND: Pursuant to the provisions of Section 107, Article 1, Chapter 31 of the Code of West Virginia, the undersigned corporation adopts the following Articles of Amendment to the Articles of Incorporation of Leavitt Funeral Home, Inc., originally filed in the office of the West Virginia Secretary of State on October 24, 1951, and previously amended on February 19, 1982. The Articles of Incorporation are hereby amended as follows:

(1) Section IV of the Articles of Incorporation of Leavitt Funeral Home, Inc. is amended to read in its entirety as follows:

"The corporation is organized as:

A. Non-stock, non-profit _____.

B. Stock, for profit __X__, and the authorized capital stock of said corporation will be One Hundred Thousand Dollars ($100,000.00), which will be divided into Ten Thousand (10,000) shares of Voting Common Stock, par value Ten Dollars ($10.00) per share."

(2) A new Section 7 of the Articles of Incorporation of Leavitt Funeral Home, Inc. is amended to read in its entirety as follows:

"The name and address of the appointed person to whom notice or process may be sent is:

Jonathan C. Leavitt
20 South Hills Drive
Parkersburg, West Virginia 26101"

THIRD: The number of shares of which are outstanding and entitled to vote on said amendments is 282.

FOURTH: The designation and number of outstanding shares of each class entitled to vote thereon as a class were as follows:

CLASS	NO. OF SHARES
Common	282

FIFTH: The number of shares voted for such amendment was 50; and the number of shares voted against the amendment were zero.

SIXTH: The number of each class entitled to vote thereon as a class voted for and against such amendment, respectively, were:

CLASS	NO. OF SHARES	
	FOR	AGAINST
Common	282	0

SEVENTH: The manner in which any exchange, reclassification or cancellation of issued shares provided for in the amendment shall be effected, is as follows: Each holder of record of one or more certificates representing shares of the old common stock shall be entitled to receive one or more certificates representing the proportionate number of shares of the new common stock on surrender of the old certificate for cancellation.

EIGHTH: The amount of the authorized capital stock of this corporation shall be increased from 1,000 shares at the par value of $100.00 per share to 10,000 shares at the par value of $10.00 per share. The total authorized capital stock shall thereafter be $100,000.00.

NINTH: The foregoing amendments were adopted by the Shareholders of Leavitt Funeral Home, Inc. at a meeting of said Shareholders duly called and held on the 31st day of December, 1999, at which a quorum was present.

Dated: December 31, 1999

LEAVITT FUNERAL HOME, INC.

By: Jonathan C. Leavitt
Its President

and

By: Stephen P. Leavitt
Its Secretary

STATE OF WEST VIRGINIA
COUNTY OF WOOD, to wit:

I, Patricia L. McCullough, a notary public, do hereby certify that on this 31st day of December, 1999 personally appeared before me Jonathan C. Leavitt and Stephen P. Leavitt, who, being by me first duly sworn, declared that they are the President and Secretary, respectively, of Leavitt Funeral Home, Inc., that they signed the foregoing document as President and Secretary of the corporation, respectively, and that the statements therein contained are true.

Patricia L. McCullough
Notary Public

My Commission Expires: May 27, 2002

(NOTARIAL SEAL)

These Articles of Amendment were prepared by or under the direction of Richard A. Hudson, Esquire, of the law firm Spilman Thomas & Battle, PLLC, P. O. Box 1469, Parkersburg, West Virginia 26102.

Doc #: 107811

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
PATRICIA L. McCULLOUGH
LEAVITT FUNERAL HOME, INC
403 SEVENTH ST.
PARKERSBURG, WV 26101
My Commission Expires May 27, 2002

WOOD COUNTY COMMISSION
CORPORATIONS Clerk 04
Date/Time: 03/15/2000 10:32
Inst #: 312449
Book/Page: 50- / 556-
Recd/Tax: 4.00 .00

X

Section 3

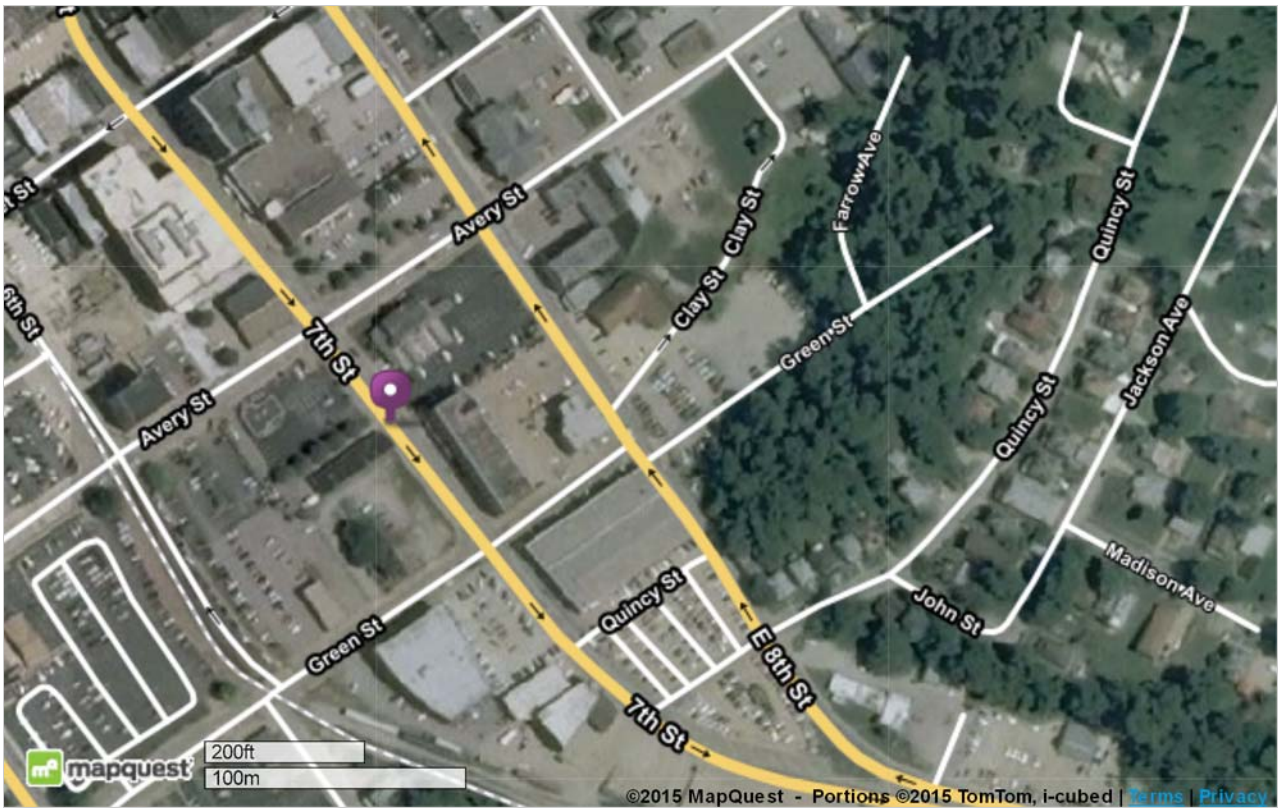
Map of:

414 7th St

Parkersburg, WV 26101-4602

Notes

Location of new crematory for Leavitt Funeral Home, Inc.



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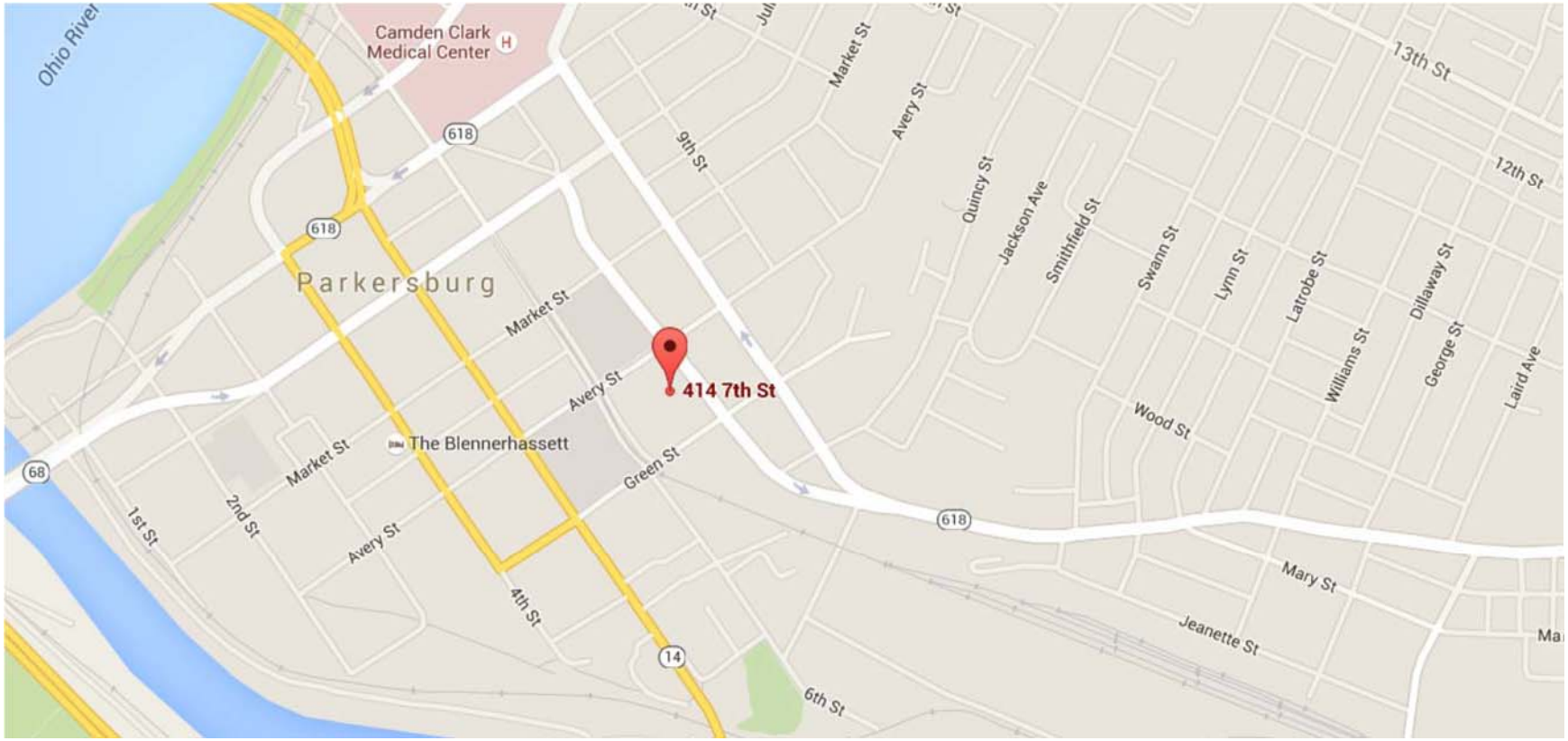
Leavitt Funeral Home, Inc.

Crematory Location

414 Seventh Street
Parkersburg, WV 26101



Leavitt Funeral Home
Crematory Location
Legend
414 7th St
414 7th St
Old U.S. 50
Google earth
© 2015 Google
N
100 ft

Section 4

Attachment C

Schedule of Planned Installation of New Human Cremator

Upon receipt of the Permit for Relocation we are planning on the following schedule for the installation and Start-up of one (1) Facultatieve Technologies FT II SE Cremation System. These dates could possibly change due to construction of the new crematory building and manufacturing of the cremator from our vendor, Facultatieve Technologies. In the event that the dates change we will provide a revised schedule to West Virginia Department of Environmental Protection – Division of Air Quality a minimum of 30 days from the anticipated installation and start-up.

Tuesday, November 10, 2015	Equipment delivered to jobsite, installation begins
Wednesday, November 11, 2015	Equipment installation continues
Friday, November 13, 2015	Installation complete
Monday, November 16, 2015	Operator training
Tuesday, November 17, 2015	Cremator Start-up / Operational

Section 5

West Virginia Department of Environmental Protection
Division of Air Quality

Application for NSR Permit

This Section Not Used

Section 6

ATTACHMENT

PROPERTY DESCRIPTION

414 Seventh Street
Parkersburg, WV 26101

All those certain lots, tracts or parcels of real estate situate, lying and being in the City of Parkersburg, County of Wood and State of West Virginia, more particularly bounded and described as follows:

FIRST TRACT: BEGINNING at a point on the southerly side of Seventh Street 135.27 feet from the southeast corner of Seventh Street and Avery Street, and being at the corner of the estate of Jacob B. Jackson; thence with the line of the estate of Jacob B. Jackson and parallel with Avery Street toward Sixth Street 167.15 feet to a point; thence toward Avery Street and parallel with Sixth Street 25.73 feet to a point; thence toward Sixth Street and parallel with Avery Street 21.9 feet to a point which is 150 feet from Sixth Street; thence easterly and parallel with Sixth Street 84.49 feet to the line of a lot sold by Anna E. Baldwin to Matthew McNulty of record in the Office of the Clerk of the County Commission of Wood County, West Virginia, in Deed Book 46, at page 347; thence toward Seventh Street 34 feet to a lot now or formerly owned by George W. Carney, which is 184 feet from Sixth Street; thence westerly and parallel with Sixth Street 6.92 feet to a corner of the Carney lot; thence toward Seventh Street and parallel with Avery Street 158.3 feet to Seventh Street; thence westerly with the line of Seventh Street 52 feet to the place of beginning.

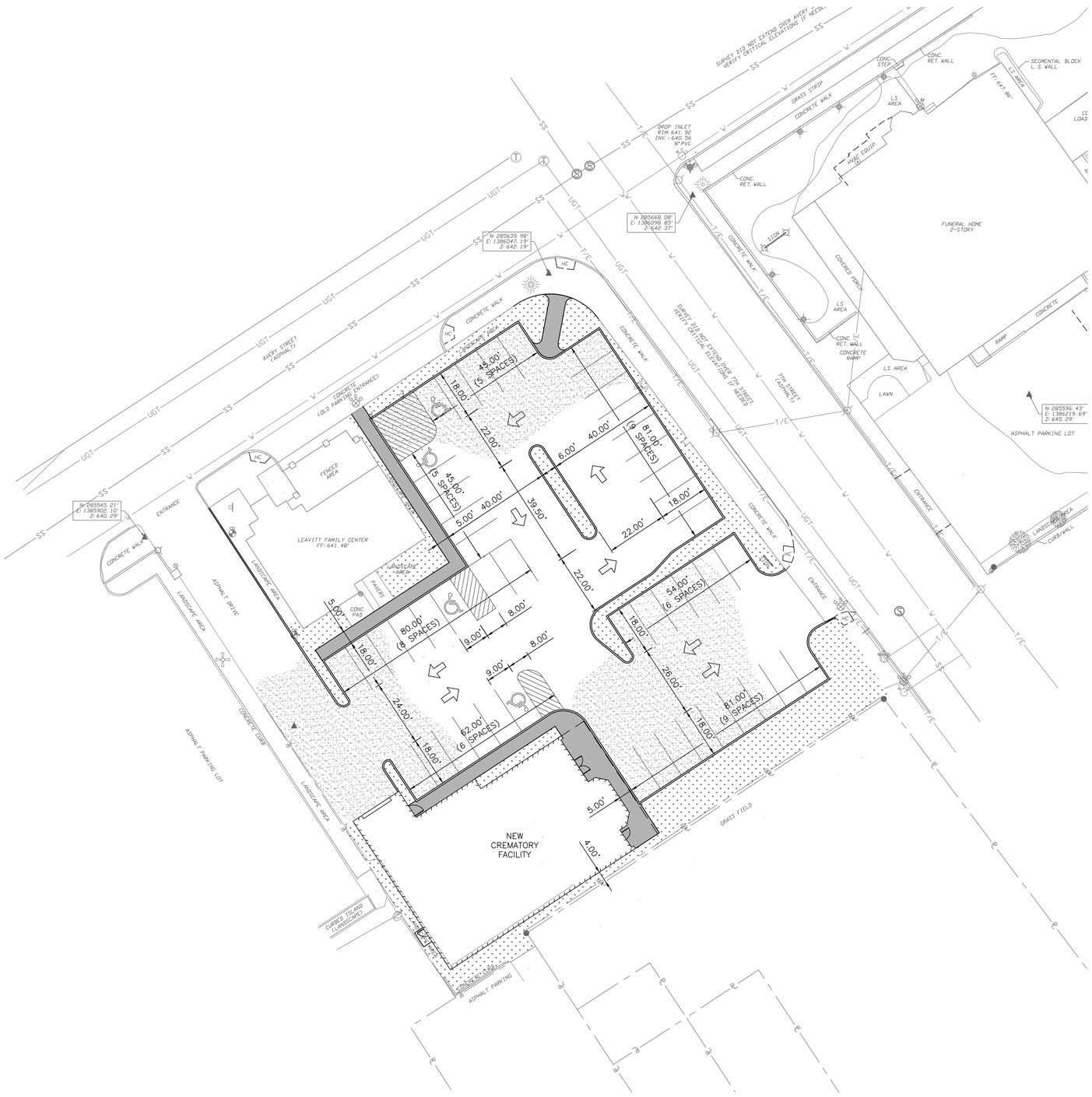
SECOND TRACT: BEGINNING at a point in the eastern line of Avery Street, 146.9 feet north of the northeastern corner of the intersection of Sixth and Avery Streets, a common corner to Lot Numbers 7 and 8 of the Tavenner Estate, shown on the plat hereinafter mentioned; thence in an eastern direction and with the common line of Lot Numbers 7 and 8, 109.27 feet to a point, another common corner to said Lot Numbers 7 and 8; thence at right angles in a northern direction and in a line parallel to the eastern line of Avery Street, 25 feet to a point; thence at right angles in a western direction and in a line parallel with the common line of Lot Numbers 7 and 8, 109.27 feet to a point in the eastern line of Avery Street; thence in a southern direction and with the said eastern line of Avery Street, 25 feet to the place of beginning, being all of Lot No. 8 of the division of the Tavenner Estate, a plat of which is of record in said Clerk's Office in Deed Book 89, at page 206.

BEING the same real estate conveyed unto Home Medical Equipment Co., a West Virginia corporation, by John F. Learman and Patricia L. Learman, husband and wife, by deed dated May 17, 1989, and of record in the aforesaid Clerk's Office in Deed Book 873, at Page 731.

THIRD TRACT: BEGINNING at a point lying N. 30° 16' 18" W. 175.26 feet from the intersection of the Westerly line of 7th Street aka Old Northwestern Pike and the Northerly line of Green Street, said point being the most Northerly corner of a 0.445 acre tract of land as conveyed to F. L. Morehead (DB 935/PG 244) from which the property described herein is a part; thence along said Westerly line of said 7th Street S. 30° 16' 18" E. 1.00 foot to a point; thence leaving said Street S. 63° 18' 32" W. 153.56 feet to a point; thence N. 26° 38' 39" W. 1.00 foot to a point in the Northerly line of the above-mentioned Morehead property; thence along the said Northerly line N. 63° 18' 32" E. 153.50 feet to the point of beginning, containing 154 square feet or .004 acres, as more particularly shown on the Survey of Matthew B. Harper OH PS S-7397 under the supervision of Paul M. Cochran, WV PS No. 48, dated November 1, 1994, attached to a deed of record in the aforesaid Clerk's Office in Deed Book 938, at page 654.

BEING the same real estate conveyed unto Home Medical Equipment Co., a West Virginia corporation, by F. L. Morehead, by deed dated November 23, 1994, and of record in the aforesaid Clerk's Office in Deed Book 938, at Page 654.

This conveyance is made subject to all rights of way, reservations, restrictive and protective covenants, and oil, gas and mineral leases of record in the chain of title in the aforesaid Clerk's Office.



CONCEPTUAL SITE PLAN
SCALE: 1"=20'

Attachment E - 2

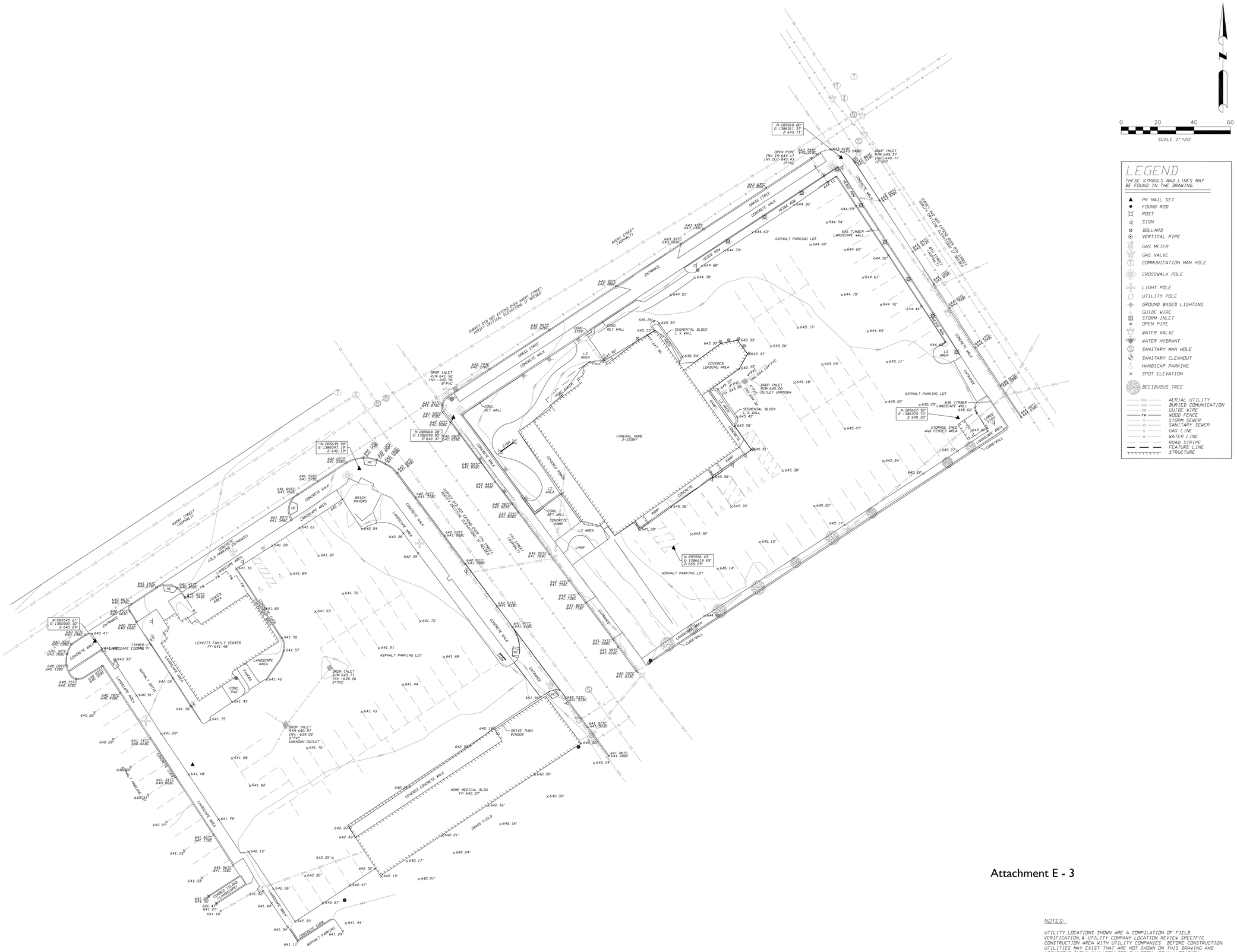
PICKERING ASSOCIATES
Architects • Engineers • Surveyors
11283 Emerson Avenue
Parkersburg, WV 26104
Phone: (304) 464-5305
Fax: (304) 464-4428

Rev.	Description	By	Date
A	ISSUED FOR REVIEW	MAW	06/25/15

Drawing Description

LEAVITT FUNERAL HOME
403 7TH STREET, PARKERSBURG, WV
LEAVITT FUNERAL MASTER PLANNING - PHASE 1
CONCEPTUAL SITE PLAN

Project: 2159037
Designed By: JRB
Drawn By: JRB
Checked By: MAW
Scale: AS NOTED
Plot Date: 06/25/15
Revision: A
Drawing Number:
C100



Attachment E - 3

NOTES:

UTILITY LOCATIONS SHOWN ARE A COMPILATION OF FIELD VERIFICATION, & UTILITY COMPANY LOCATION REVIEW SPECIFIC CONSTRUCTION AREA WITH UTILITY COMPANIES BEFORE CONSTRUCTION. UTILITIES MAY EXIST THAT ARE NOT SHOWN ON THIS DRAWING AND LOCATIONS SHOWN MAY VERY GREATLY FROM ACTUAL LOCATION.

ELEVATIONS BASED UPON OPUS SOLUTION NAVD 1988
COORDINATES BASED UPON OPUS SOLUTION WV STATE PLANE COORDINATES NORTH ZONE

UTILITY CONFIRMATION #1512027836 & 1512629950

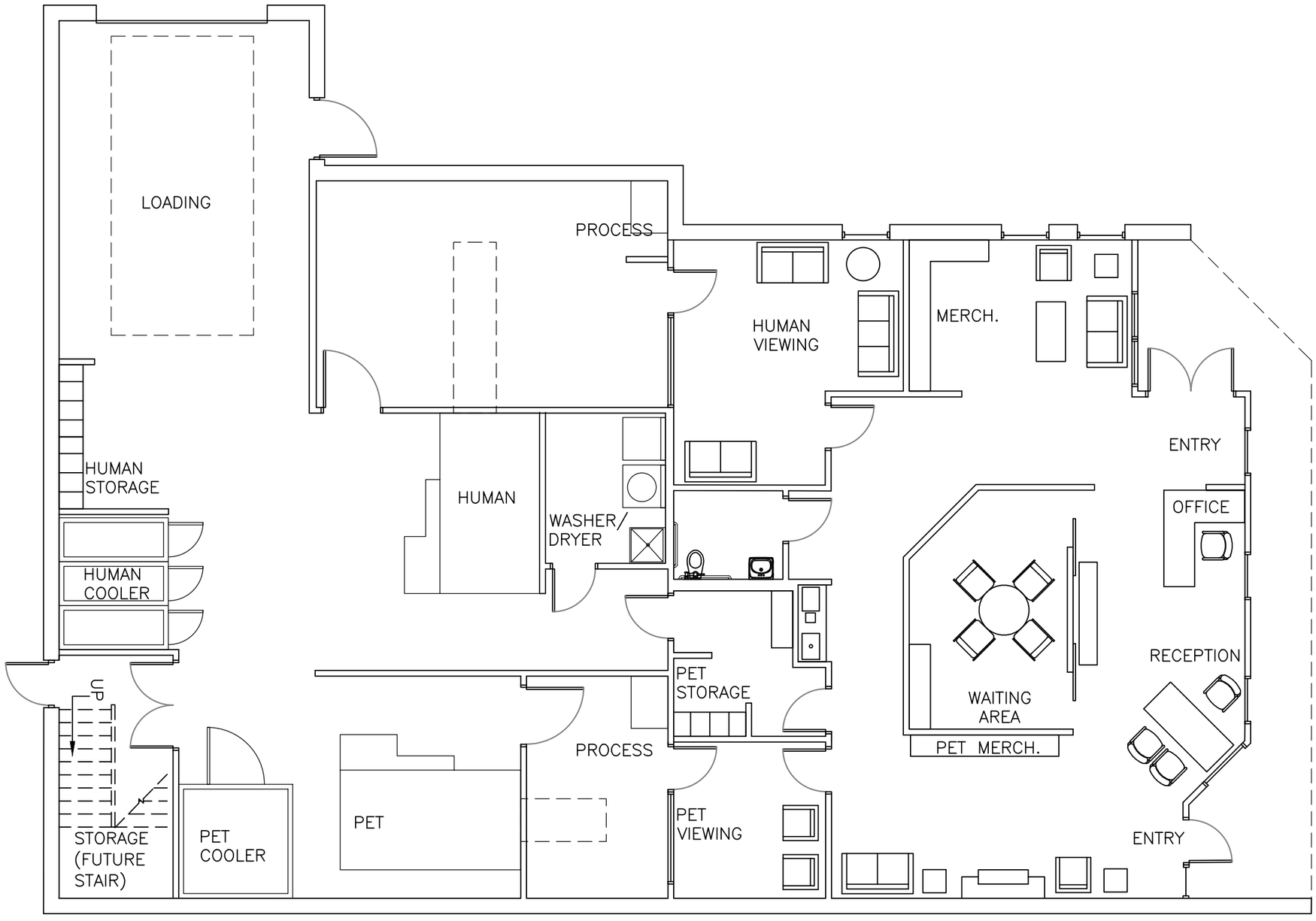
SHEET NUMBER S1
DATE: 5/13/2015
PROJECT # 2159037

LEAVITT'S FUNERAL HOME
7TH AND AVERY STREET
TOPOGRAPHIC SURVEY

PARKERSBURG CORPORATION
WOOD COUNTY, WV

PICKERING ASSOCIATES
Architects • Engineers • Surveyors
1283 EMERSON AVENUE, PARKERSBURG, WV 26104
(304) 464-5305 PICKERING USA.COM

DRAWN BY: WBS
CHECKED BY: TB RRC II
REVISIONS:
1.
2.
3.
4.



Attachment E - 4

CONCEPTUAL PLAN D

SCALE: 1/8" = 1' 0"

PICKERING ASSOCIATES
Architects • Engineers • Surveyors
11283 Emerson Avenue
Parkersburg, West Virginia 26104
Phone: (304) 464-5305
Fax: (304) 464-4428

Rev.	Description	By	Date

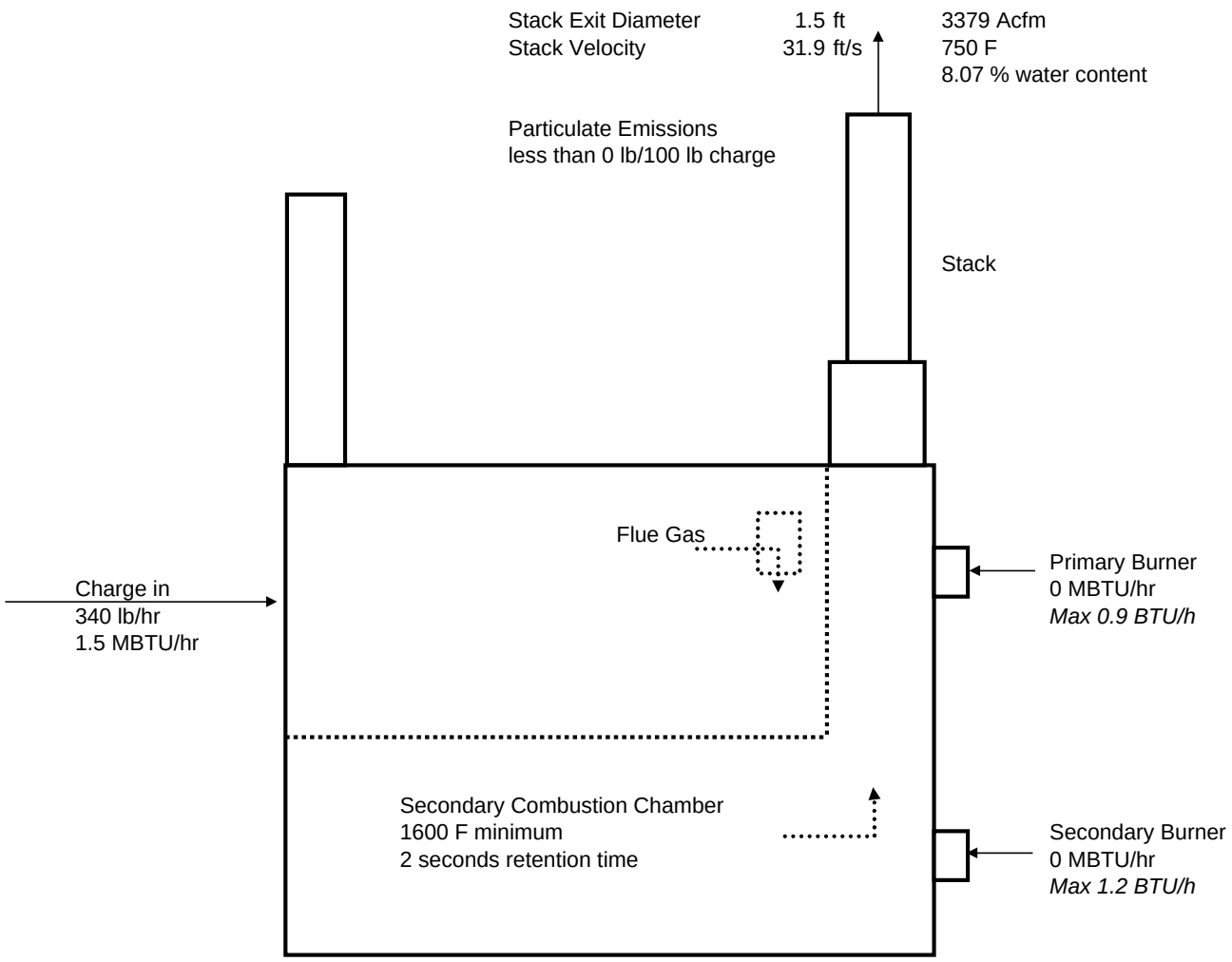
Drawing Description

LeavittFuneral Home
403 7th St. Parkersburg, WV 26101
New Crematory Facility
Conceptual Plan B

Project: 2159037
Designed By:
Drawn By:
Checked By:
Scale: 1/8"= 1'0"
Plot Date: 7/21/15
Revision: A
Drawing Number:
A4

Section 7

Attachment F - Process Flow



Normal Operating Condition

Energy from charge	1.5	MBTU/hr
Energy from Primary Burner	0	MBTU/hr
Energy from Secondary Burner	0	MBTU/hr
Total Energy	1.5	MBTU/hr

Facultatieve Technologies
Cremation & Incineration Equipment

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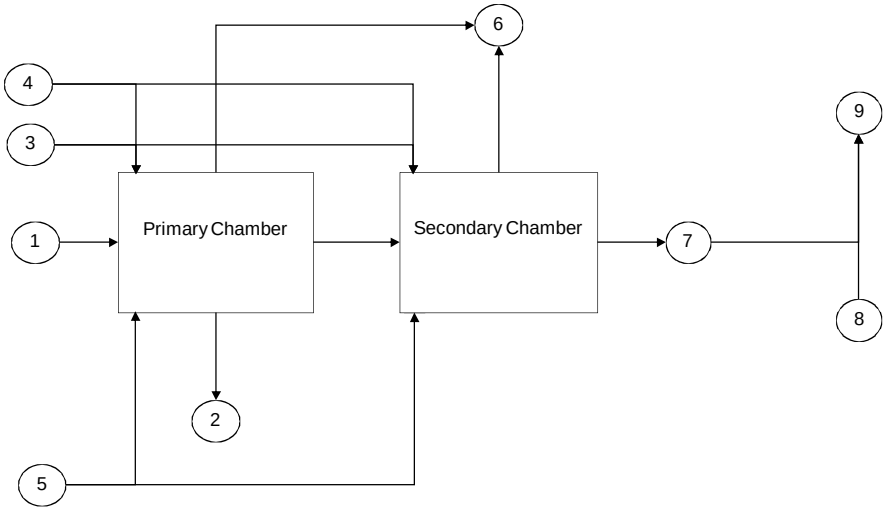
Drawn	Ernie Kassoff	Title	FTII
Date	17-Jul-15		Process Flow Diagram
Project			Normal Operating Condition
	Leavitt Funeral Home	Drg No	XXXX PFD 0001



Normal Operating Condition

		1	2	3	4	5	6	7	8	9
Description		Charge	Ash	Fuel	Burner Air	Combustion Air	Heat Loss	Cremator Flue Gas Out	Ejector Air	Final Flue Gas
Mass kg/h	CO2							147		148
	O2							79		514
	N2							705		2148
	SO2							0		0
	HCl							0		0
	H2O	71			0	7		136	15	151
	Dry mass	84	6		0	911			1879	
	Fuel			0						
	Total	155		0	0	919		1068	1894	2961
Volume Nm³/h					0	714		861	1472	2333
Volume Am³/h					0	766		3826	1580	5741
Temperature °C		20	600	20	20	20		941	20	399
Energy kW		446	1	0	0	10	16	439	21	461

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Facultatieve Technologies
Cremation & Incineration Equipment

Drawn	Ernie Kassoff	Title	Cremator Heat & Mass Balance
Date	17-July-2015		
Project	Leavitt Funeral Home	Contract	XXXX HM 0001

Section 8

Attachment G

Process Description of Facultatieve Technologies FT II Cremator

The Facultatieve Technologies FT II Cremator is designed to burn human remains and coffins. Its automatic controls will function to cremate efficiently with the minimum of operator intervention. It is designed to operate in compliance within the emission legislation outlined by the West Virginia Department of Environmental Protection – Division of Air Quality.

Below you will find a basic description of the operation of a Facultatieve Technologies cremator. Additional documentation including our Technical Brochure and Technical Specifications can be found following the descriptive.

The Facultatieve Technologies FT II Cremator is a multiple chamber design (primary and secondary) and in the case of Leavitt Funeral Home, Inc. will be fired with natural gas as auxiliary fuel. The cremator has a nominal burn rate of 150 – 200 lbs. per hour of human cadavers. The cremator is designed with an automated loading system allowing single batch loading.

The standard process of cremating a human cadaver in a Facultatieve Technologies cremator is to preheat the machine with the secondary chamber (afterburner) reaching a controlled temperature of not less than 1600°F and the primary chamber reaching a minimum temperature of 1035°F. Once these parameters have been met the operator is instructed that the cremator is ready to process a cremation. At that time the operator instructs the machine via the computerized touch screen to charge (automatically place into the primary chamber) the cadaver. The primary chamber door automatically opens and the cadaver is delivered via the automated loader into the cremation chamber. The door then closes and the cremation process begins with automatic control process of all functions via the onboard computer/PLC controller. Typical process times average 72 minutes and the cremator has a sight glass where the operator can observe that the cremation process has fully completed. Upon completion of the cremation process the operator opens the primary chamber door and moves the cremated remains into a cooling area for final disposition. The design of the Facultatieve Technologies FT II cremator is to immediately charge the next cadaver into the primary chamber immediately after the cremated remains have been moved to the cooling area. No cooldown is required and thus less requirements for excess fuel usage (cooling and reheating the system) and reduction of emissions from the cremator. In addition, the process design of the Facultative Technologies cremator is to use the human cadaver as the primary fuel source and only use natural gas to supplement the cremation process. Once the machines refractory is super-heated the use of gas to perform the cremation process is virtually non-existent. The only gas used is in the secondary chamber (afterburner) to maintain the regulated temperature of 1600°F required by the West Virginia Department of Environmental Protection – Division of Air Quality. The sum effect of this design is drastically reducing emissions.

As stated above, the Facultatieve Technologies is a multi-chamber cremator with a primary chamber where the cremation takes place and then a secondary chamber where destruction of emissions occur.

- The Primary Chamber is approximately 88 cu. ft. with a burner located in the rear wall of the hearth area. This burner is designed to modulate between low and high fire with a capacity of 0.85 MMBTU/hr. The temperatures in the primary chamber are controlled by the use of a temperature probe and PLC logic.

- The Secondary Chamber is approximately 113 cu. ft. in volume with a burner located in the rear wall. The unique design of our secondary chamber uses a serpentine baffle system to ensure that emissions from the primary chamber have ample time for destruction with a minimum of 2 seconds retention time prior to reaching the flue stack. As in the primary chamber the burner modulates between low and high fire with a capacity of 1.2 MMBTU/hr. The temperatures in the primary chamber are controlled by the use of a temperature probe and PLC logic.

The exhaust stack is estimated to have a total overall height of 28 ft. above grade level.

Health and Safety:

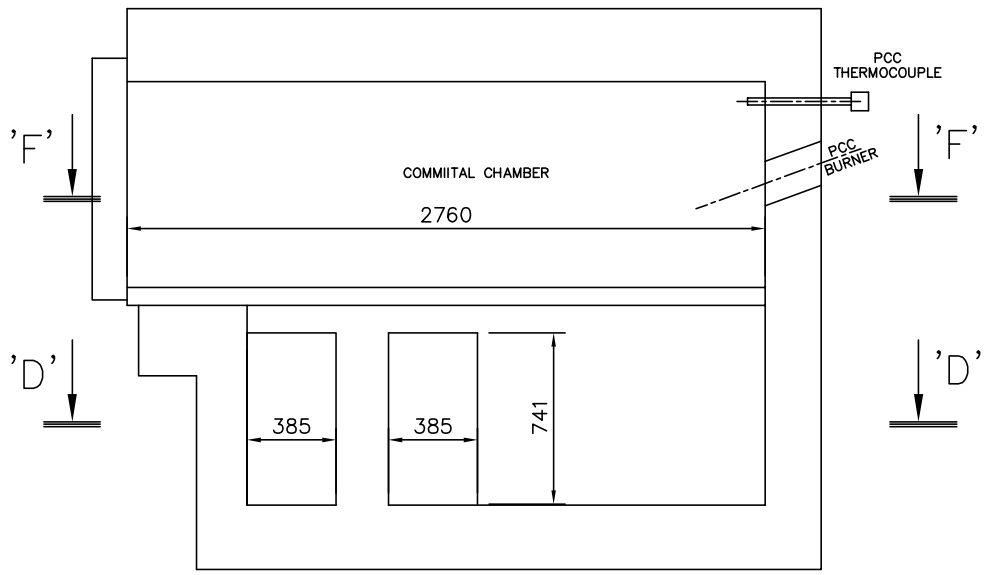
Statement of Intent

Facultatieve Technologies the Americas is one of North Americas leading suppliers of human and animal cremation systems supporting major blue chip companies throughout the industry. Facultative Technologies the Americas recognizes the impact that its business activities have on employees, the public and the environment.

As part of our corporate strategy, we intend to:

- Continuously improve a culture that recognizes the importance of Health, Safety and the impact of its products upon the Environment to the success of its business, and exercises its responsibilities in a manner that reflects this objective.
- Ensure that only the highest practical standards are achieved and adhered to in all our undertakings.
- Operate facilities in a manner that minimizes rick to employees, visitors, the Environment and community.
- Continually improve our performance in Health & Safety and the Environment through active participation, commitment and support of all our employees.

A B IF IN DOUBT ASK C DO NOT SCALE D REMOVE ALL SHARP EDGES E F



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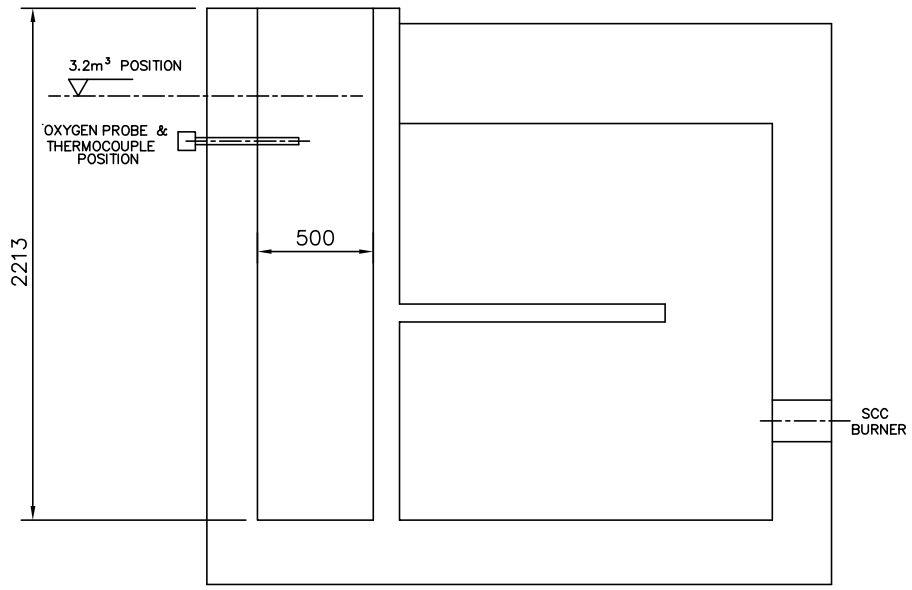

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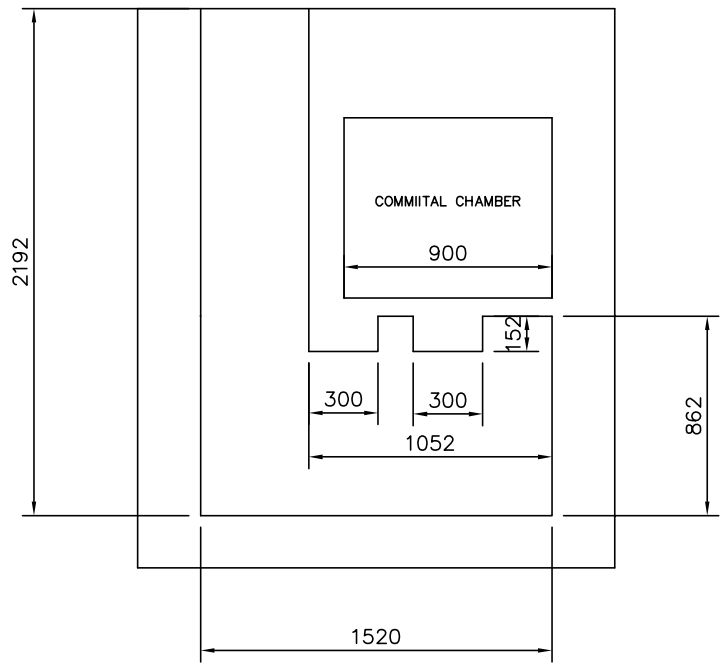

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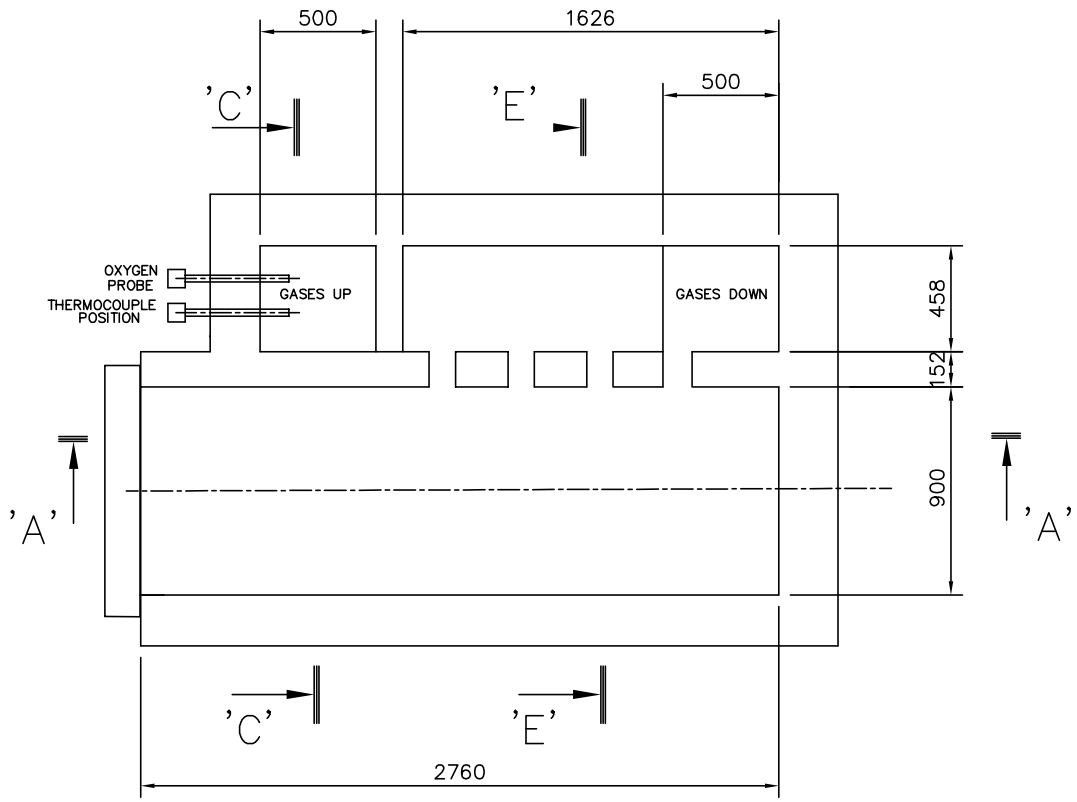

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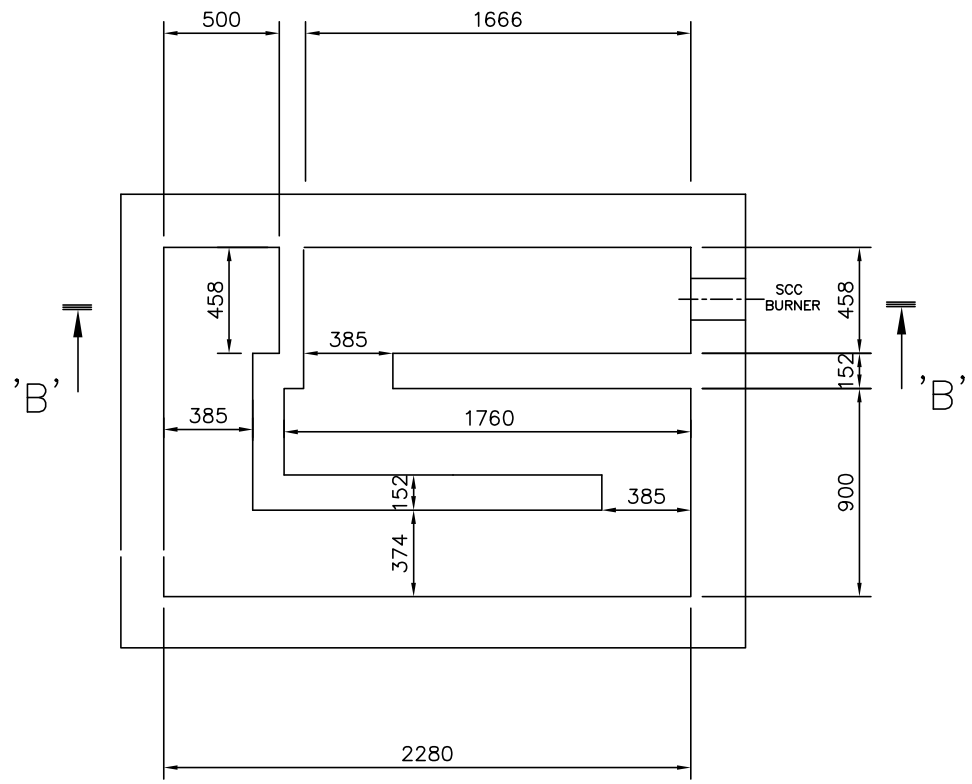

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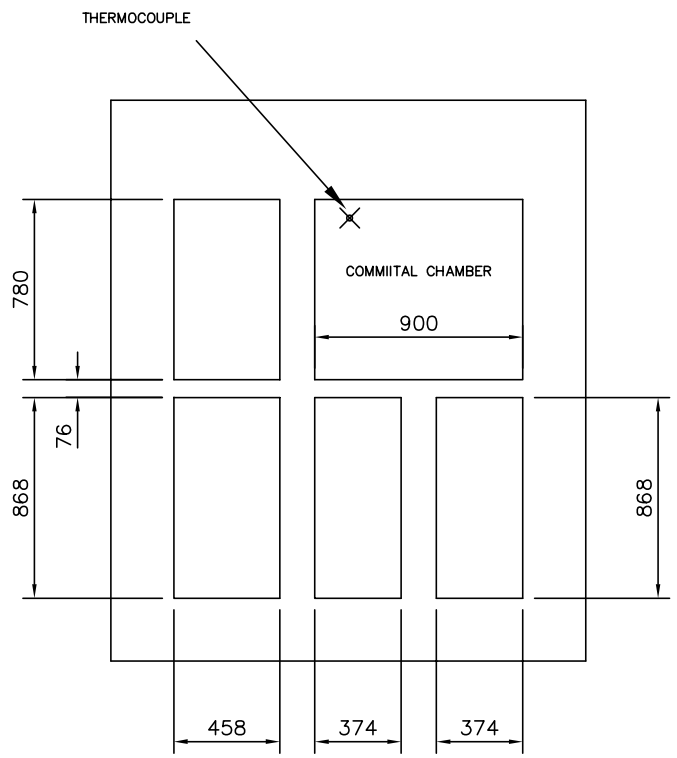

SECTION 'E'–'E'

Issue No P4	Issue No P3	Issue No P2
UPDATE	UPDATE	ADDED BURNERS
Mod By: DTuckwood	Mod By: DTuckwood	Mod By: DTuckwood
Date: 22/2/07	Date: 4/12/02	Date: 15/11/02
Chk'd:	Chk'd:	Chk'd:

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Drawn : DTuckwood	Date : 30/11/02	Title : COMMITAL CHAMBER & SECONDARY CHAMBER DIMENSIONS FOR FTII CREMATOR
Chk'd : JDPorter	Date : 31/11/02	
Appv'd:	Date :	
Scale : 1:25 @ A2	Dir T: SALES USA	
Project : FTII		Drg No : SK3742A S/END

Issue P4

Facultatieve Technologies

Cremation & Incineration Equipment

TECHNICAL SPECIFICATIONS

FT II / FT III CREMATORS

Date: May 2013 | ***US Manufactured FT II & FT III*** | E. Kassoff

Facultatieve Technologies The Americas, Inc. Facultatieve Technologies is a member of 'the Facultatieve Group'

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1.0 INTRODUCTION

The ***FT II & FT III*** Cremators' have been designed to cater to the specific needs of the modern day crematorium facility. The cremators' enable the proper disposal of containers and human remains while complying with the necessary flue gas emission requirements and legislation of city, state and federal agencies.

These cremators have been specifically designed after many years of experience and research in this specialized field. In designing the cremators, we have minimized the necessary labor required to operate it, and therefore the simplicity of its design ensures easy operation.

The design of these cremators is very capable of reducing the body to a high quality inert ash in a very efficient manner.

1.1 The Advanced Technical Features of the *FT II & FT III* Cremator

- **Excellent environmental performance** - emissions conforming to current U.S.A. and other world standards.
- **Robust solid hearth** - providing single pass raking
- **Excellent extended hearth life**.
- **Highest quality refractory** - including 63% Alumina in areas of heavy wear.
- **Robust construction** - a design capable of 6 or more cremations per day with cremation times around 60 to 80 minutes are fully achievable.
- **One secondary combustion zone burner** to ensure a secondary zone temperature of 1600°F, which can be maintained under all conditions of normal operation.
- **Aesthetically pleasing cabinet** with easily removable factory finished decorative covers.
- **Automatic control of air** - for both combustion and flue gas cooling purposes.
- **Advanced modern PLC control** to ensure optimum combustion conditions by continuously monitoring all combustion processes throughout each cremation.
- **Automatic control of suction**.
- **Automatic temperature control** of both primary and post combustion zones.
- **Automatic fail safe** against over temperature and pressure.
- **Compact design**, enabling easy installation.

2.0 ENVIRONMENTAL PERFORMANCE

The design of this cremator provides a secondary combustion zone, which maintains the flue gas temperature greater than 1600°F for a time of greater than 2 seconds during operation, with oxygen content of greater than 6%.

Similarly emissions of Carbon Monoxide will be less than 4.4 grains/100s ft^3 at all time, as measured at reference conditions of 11% O_2, 1 atm, 32°F, dry.

3.0 PROPOSED INSTALLATION

The ***FT II & FT III*** Cremators' are of a modular design, which allows the user to pick and choose the options available.

The basic ***FT II & FT III*** cremator will consist of the following:

- Single end design
- Dedicated combustion air fan.
- Dedicated draft control system comprising of an ejector air fan and ejector system.
- Automatic PLC based control system in conjunction with:
  - ✓ Easy to use Human Machine Interface (HMI) in the form of a standard desktop PC, complete with a Touch Screen SCADA system and standard data logging package.
- Remote engineering support - via modem.
- Stainless steel chimney

In addition, the following ***options*** may be considered:

- *FT II* & *FT III* cremator supplied in double end format.
- Remote location of combustion air fan and ejector fan.
- Automatic Container Loading Systems.
- Additional Flue Gas Monitoring Equipment – CO Analyzer, Opacity and Particulate monitors.

4.0 CREMATOR GENERAL DESCRIPTION

4.1 Principle of Operation

The cremator is comprised of a large primary chamber of generous proportions into which the container is inserted and within which the primary combustion takes place. The hearth floor is lined with flat sillimanite tiles which are easily replaced when required. To keep the primary chamber entirely separate from the secondary chamber and avoid bypassing of the flue gases, the hearth itself contains no openings; this ensures that all materials are retained for combustion in the primary chamber. The waste gas produced from this phase of the process exits the primary chamber via transfer ports in the chamber sidewall, descending below the solid hearth into the secondary combustion zone in which the gas phase combustion takes place.

The gases enter this zone and are then heated if necessary by the secondary zone burner and treated by the introduction of additional air. The flue gases make numerous passes within the secondary combustion zone, where the temperature is maintained at the required combustion temperature of 1600°F. The two requirements of temperature and oxygen are met to ensure compliance to the local, state and federal environmental requirements. Feedback to the control system from the emissions monitoring equipment ensures close control is always maintained, resulting in low pollutant emissions and excellent fuel economy.

4.2 Primary Combustion Chamber

The primary chamber is equipped with a single Facultatieve Technologies designed burner located in the end wall and two independently controlled sets of air jets. The locations of the air jets are critical to maintain superior combustion properties are located as follows:

- Top air introduced along the midpoint of the roof.
- Side air introduced along the sidewall of the cremator slightly above the hearth.

4.3 Secondary Combustion Zone

The FT cremator benefits from a generously designed secondary combustion zone, 115 cu. ft. in volume, and is of sufficient size to ensure a flue gas residence time of 2 seconds at all times during operation.

The FT cremator is designed with a secondary combustion zone comprising a series of passes below and to one side of the primary chamber. One independently operated Facultatieve Technologies designed burner within this zone ensures that the temperature requirements are maintained while adequate supplies of secondary air and the tortuous flue path ensure high levels of turbulence to promote complete combustion.

The post combustion of the flue gases is completed within these high intensity areas, and thus all smells and smoke are eliminated. The design of the post combustion chambers ensures a lengthy, complex passage through the cremator prior to the flue gas exit.

4.4 Combustion System

The primary chamber burner has a maximum rating of 850,000 Btu/hr and this enables normal operating temperature in the range of 1470°F to be achieved in the primary chamber.

(The maximum allowable operating temperature is 2010°F to 2100°F)

The secondary combustion zone burner has a maximum rating of 1,250,000 Btu/hr enable temperatures of 1600°F to be achieved in the secondary chamber as required by local, state and federal environmental regulations.

The primary and secondary burners are mounted at the rear of the cremator facilitating easy access for maintenance and repair.

The burners are configured for ***full modulating control,*** are ignited automatically and the burner system is protected against flame failure, thereby complying with the gas regulations outlined by NFPA and other North American agencies.

4.5 Control Valves and Instrumentation

The addition of combustion air to the combustion process is regulated by five modulating control valves, controlling the individual supply of air to each of the burners, primary chamber and to the secondary chamber.

The cremator primary chamber under-pressure condition is controlled via a differential pressure transducer, controlling the draft generation system and provides protection against system overpressures.

The primary chamber and secondary chamber temperatures are measured via type K thermocouples; temperatures are displayed on the interactive touch screen controller.

4.6 Combustion Air System

The cremator is supplied with combustion air by a dedicated fan designed to be capable of providing the required air pressure and flow for proper cremator operation. For higher operational efficiencies and reduced operational costs the fan is controlled by a variable speed inverter to ensure that the minimum of energy is used during the cremation process. The fan is located in an integrated enclosure within the cremators' decorative panelling and the enclosure is acoustically lined.

4.7 Induced Draft System - *Cremator Under-pressure / Draft Generation*

The cremator under-pressure is constantly measured and controlled by the addition of a cooling air volume into the hot flue gases via a Facultatieve Technologies designed ***coanda*** ejector located in the cremator waste gas outlet.

The volume of ejector air is constantly modulated by a variable speed inverter controlled ejector fan motor, the speed of the fan (hence the level of draft) is controlled by the cremators PLC control system.

Additionally, a pressure sensor controller continually monitors any overpressure condition within the cremators' primary chamber. On detection of overpressure the combustion air to cremator is automatically turned off so that the combustion rate within the cremator is rapidly reduced. On sustained overpressure, the cremator will go into abort mode until the cause of problem is identified (for example, this could be the failure of the ejector air supply).

This separate ejector fan is located in an integrated enclosure within the cremators' decorative panelling, which is acoustically lined.

4.8 Cremator Process Control – PLC Based

The cremator is supplied with a dedicated **Programmable Logic Controller (PLC)**; this controller supervises the operation of the cremator, the combustion process and automated loading (if utilized).

The cremators' control panel design is based upon a modern "*compact design*" PLC, complete with 32 digital inputs and 32 digital outputs in standard configuration with a maximum of 48 dependant on options fitted to each individual cremator. The programmable logic controller is preloaded with our dedicated control software program.
Facultatieve Technologies utilises the Mitsubishi PLC and associated *Melsec* computer software for process control of the cremator.

Manufacturer: Mitsubishi
Base unit Type: FX 3 U – 64 MR

The PLC based control system is capable of the total control of the cremator and all its functions in order to complete the cremation process once the primary chamber has been charged. The requirement for operator assistance is negated, therefore simplifying the day to day operation of the cremator.

The PLC control system automatically varies the combustion program according to container type and body weight (input by the operator prior to charging). The system constantly monitors signal inputs from thermocouples placed throughout the cremator providing information from the gas analyser's and then sending output signals to control the combustion air levels, burner operation and draft control system. This ensures total control of the cremator at optimum performance levels, guaranteeing cremations times are reduced, fuel efficiently is increased and emission limits are adhered to.

The system also monitors for combustion and component faults, taking appropriate action as required and transmitting fault alarms to the operator display. Should the need arise; provision has been included for manual override. Manual control of the cremator is then logged by the control system for verification of the process. However, the control system has specific software to safeguard the machine while under manual control preventing any dangerous situation from arising from incorrect manual operation.

The control enclosure, including the PLC system is located on the side or rear of the cremator. This location minimizes any of the effects that excess heat might cause and is adequately ventilated to ensure trouble free operation.

4.9 Personal Computer Based Control System Including Data Logging

The cremator is supplied with a personal computer (PC) for the operator to observe the operation of the cremator from a separate office area. This PC based control system is equipped with the Facultatieve Technologies industry leading control graphics package, and offers the added benefit of data logging and remote engineering support via a computer link.

The PC is equipped with the following software preinstalled:

- Microsoft Windows 7 operating system
- Opsoft for Windows
- Integrated graphics package
- Mitsubishi Melsec Medoc package
- Team Viewer remote computer access software

For the above control interface, the PLC design includes a serial data card, which, via a RS 232 or RS 485 connection communicates with the computer system. Allowing the use of our Windows based Optsoft graphics package to operate a **S**upervisory **C**ontrol **A**nd **D**ata **A**cquisition system – known as **SCADA.**

The software control program includes automatic data logging and this information is used to automatically generate a report in a format agreed by the Environmental Authorities and requires no further manipulation by the operator.

4.10 Cremator Process Control – Safety Features

The burner flame failure and burner safety systems are housed separately from the burners. They comprise of flame failure safety relays connected to a flame rectification type probe to monitor "start" flame and "main" flame. In the event that there is a flame failure in either the main burner or afterburner, these units will automatically shut off the gas and air supply valves. This will prevent burner ignition if any of the safety circuits are not energised.

An additional safety feature utilizes separate gas and air pressure switches which will shut off the burners if the air supply or gas pressure falls below or above pre-determined safety levels.

Electrical interlocks prevent the charging door being opened for the introduction of a container unless the temperature in the secondary combustion zone exceeds 1600°F. For additional safety, the charging door will only partially open during the ashing procedure (single ended cremators only).

The cremator is equipped with an automatic suction control to maintain a pre-set suction condition within the primary chamber for all normal combustion conditions. This is achieved by the dedicated ejector fan.

4.11 Remote Engineering Support

To enable remote engineering support, the standard PLC control system is supplied with a remote access facility, which enables remote observation of cremator parameters, retrieval and analysis of cremator emission data. This enables the cremator to be observed remotely by our technicians to resolve operating issues without the initial requirement to visit the site to rectify the problem. In addition, current cremator units operating in the field have allowed the modem to allow offsite maintenance scheduling and system management as well as remote monitoring of performance with Facultatieve Technologies technicians.

- Client will need to supply and maintain a suitable ADSL/broadband connection for this facility to operate.

4.12 Flue Gas Monitoring

The ***FT II*** and ***FT III*** cremators are supplied with an oxygen analyzer (detailed below), The oxygen analyzer is located at the secondary chamber exit to monitor the 0_2 concentration within the flue gases and to maintain an adequate level of 0_2 in the secondary chamber.

4.12.1 Oxygen Analysis System

Principle of operation	Zirconia based
Manufacturer	Fuji Electric
Analyser Model Type	ZRM
Detector Model	Type ZFK 2

Complete with high temperature stainless steel flow guide tube, suitable for high temperature operation.

The standard configuration above provides for the continuous monitoring of:

- Oxygen.
- Primary chamber temperature.
- Secondary combustion chamber temperature.

4.12.2 Oxygen & Carbon Monoxide Analysis System (optional)

This is based upon the Siemens Ultramat 23 Analyser utilising extractive flue gas sampling and conditioning. The Siemens Ultramat 23 has a fast response electrochemical cell for Oxygen detection and uses infra-red for carbon monoxide detection.

5.0 CREMATOR CONSTRUCTION DESCRIPTION

5.1 Shell and Framework

The shell and framework of the cremator is fabricated of steel plate and sectional steel construction, braced for rigidity, to properly support the refractory and insulating materials with which the shell is lined.

The overall external dimensions of the cremator are:

	FT *II* Cremator		FT *III* Cremator	
	Single end	**Double end**	**Single end**	**Double end**
Length	12' 8"	12' 6"	12' 8"	12' 6"
Width	6' 11"	6' 11"	7' 1"	7' 1"
Height	8' 1"	8' 1"	8' 1"	8' 1"
Height over door gear	10' 10"	10' 10"	10' 10"	10' 10"
Weight	28,500 lbs.	30,500 lbs.	29,500 lbs.	31,500 lbs.

5.2 Cremator Charging Door

The refractory lined charge door is located at the front of the cremator, counterbalanced and suspended on precision roller chains for ease of operation. Operation is by means of a single phase variable speed frequency driven electric motor controlled by adjacent push buttons, interlocked to prevent charging unless the secondary combustion chamber temperature is above 1600°F. The door opens to the full dimensions of the primary chamber allowing for maximum container size. ***Please note***; a manual door override is standard which allows the charge door to be opened in the event that there is a motor/inverter failure.

The dimensions of the charging door opening are:

	FT *II* Cremator		FT *III* Cremator	
	Single end	**Double end**	**Single end**	**Double end**
Width	35"	35"	43"	43"
Height	31"	31"	31"	31"

The **recommended maximum** size of container which can be inserted into the machine is:

	FT *II* Cremator		FT *III* Cremator	
	Single end	**Double end**	**Single end**	**Double end**
Length	92"	92"	92"	92"
Width	33"	33"	41"	41"
Height	27"	27"	27"	27"

Note:
With containers longer than 7' 0" please refer to Operations Manual instructions for "special loading" instructions (or contact Facultatieve Technologies directly) when utilizing any FT supplied Automated Loading devices.

5.3 Ash Removal

5.3.1 Single Ended Cremator

Access for raking on single ended units is through the charging door. At the end of the cremation, the door is opened to a safe, partially open position and the suction fan is energised which protects the operator from the radiated heat. The door is operated by a pushbutton and door height is controlled by PLC control system.

5.3.2 Double Ended Cremator

Access for raking on double ended units is through a dedicated rear ash door. At the end of the cremation, the door is opened by pushbutton operation to its fully open position, giving the operator easy access to the cremated remains. This door is designed and installed in a similar manner to the charging door. In the open position, the access opening is 9" high x 13" wide. ***Please note***; a manual door override is standard which allows the charge door to be opened in the event that there is a motor/inverter failure.

In both of the above designs, the ash is raked and moved directly to the integral ash chute into a refractory lined sump positioned below the ash out door. While within the refractory lined ash box, ashes are cooled automatically by a flow of air supplied by cremator blower system. The cooled ashes can then be dropped into the removable stainless ash box, by manually opening a slide valve. The ashes can then be removed from the cremator and transported elsewhere for further processing if so desired.

5.4 Access for Maintenance

The requirement of access for maintenance has been carefully considered in the cremator design, and easy removable panels have been provided for the cleaning out of accumulations of ash in any of the chambers and flue passages. Access ports to the secondary chamber and flue are provided for this purpose.

5.5 External Finish

Externally, the cremator shell is clad with pre-finished powder coated panels before leaving our production facility. Consequently, no additional finishing of these items is required and they are a distinctive feature of the cremator.

As well as giving the cremator a pleasing appearance, the panels ensure operator safety, by preventing any hot surfaces from being touched. The panels ensure a gap of air between the internal cremator shell and the external surfaces. This greatly reduces the external surface temperatures experienced.

The charging door at the front of the cremator as well as the rear ashing our door on double ender models are faced with stainless steel surrounded by a stainless steel bezel.

5.6 Refractory Materials – *FT* Cremator

5.6.1 Refractory Lining

Refractory are of high quality, comprising fire-brick, backed by calcium silicate insulation and micro-porous insulating materials.

Location of refractory in cremator	Quality of refractory (Alumina content)	Thermal conductivity (W/m °C)	Bulk density (g/cm³)	Maximum operating temperature (°F)
Used in areas of high turbulence	63%	2.0	2.25	2915
Used in cremator sidewalls	42%	1.9	2.25	2552
Used in cremator hearth	65%	1.62	2.45	2915
Castable refractory used for burner throat, lintels and outlet port	50%	N/A	2.37	1915
Ash chute	50%	N/A	2.37	2552

5.6.2 High Quality Insulation

Type and location of insulation	Insulation thickness (in.)	Thermal conductivity (W/m °C)	Bulk density (g/cm³)	Maximum operating temperature (°F)
Calcium Silicate Insulation used in the areas around and between the refractory and the steel casing	2.95"	0.10	0.2	1922
High grade micro-porous insulation included within the insulation layers between the steel casing and the internal refractory	1.00"	0.3	0.3 to 0.35	1742

The quality and thickness of the insulation materials used in the construction of the cremator are such that the exterior shell is kept at a safe temperature for the operators at all times.

6.0 TECHNICAL SPECIFICATION – *FT* CREMATOR

6.1 Cremator Primary Chamber Internal Dimensions

	FT *II* Cremator		FT *III* Cremator	
	Single end	**Double end**	**Single end**	**Double end**
Length	98"	98"	98"	98"
Width	35"	35"	43"	43"
Height (Flat roof design)	37"	37"	37"	37"

6.2 Secondary Combustion Chamber

Secondary combustion chamber volume 86.4 cu. ft.
Residence time in secondary combustion chamber > 2 seconds

The secondary combustion chamber is specifically designed to ensure a **flue gas residence time of 2 *seconds*** at a flue gas temperature of 1600°F and oxygen content of 6%.

6.3 Burners

		Max fire	Min fire
Primary chamber burner	kW	270	60
	Btu/h	921,895	204,865
Secondary chamber burner	kW	350	150
	Btu/h	1,195,049	512,164

Burner fuel: Natural gas or LPG.

Burner control mode: Continuous modulation of burner output, burners are Low NOx design.

Burner controls: Manufacturer Kromschroder

Model BCU 370

Flame detector Ionisation probe

Burner gas valves:

Primary and secondary chamber burners are fitted with fully modulating 120V gas safety control valves.

6.4 Utility / Fuel Consumption

Typical gas consumption of the cremator per cremation

- 1,000 – 1,800 ft³ of Natural Gas
  - Based upon five cremations per day, five days per week including preheat time.
  - Calorific value 935 Btu/ft³

Typical electrical consumption per hour under normal running conditions:

- 13 kWh

6.5 Cremation Capacity

This design of cremator is robust, and will perform up to **8 cremations per normal working day** (12 hours); however, it is fully capable of operating for extended periods beyond "normal working hours", as required.

6.6 Air Requirements

	Volume (ft^3_N/min)	Pressure (in. w.c.)	Motor (HP)	Manufacturer	Model
Combustion Air Fan	850(Design)	15	7.5	Cincinnati Fan	PB Series
Ejector Air Fan	300 (Min) 1500 (Max)	15	7.5	Cincinnati Fan	PB Series

	Modulating flow	
	Max flow (ft^3_N/min)	Min flow (ft^3_N/min)
Combustion air to primary chamber	300	0
Secondary chamber air	500	0

Air fan frequency inverter variable speed controller:

Manufacturer Allen Bradley
Model Power Flex 40

6.7 Cremator Process Data

	Temperatures (°F)		Static Under-Pressure	
	Max	Min		
Primary chamber	1920	1380	-0.025 to 0.275" w.c.	
Secondary chamber	2100	1600	N/A	

Note: Primary chamber temperature and pressure varies with progress of cremation.

6.8 Flue Gas Conditions

	Condition
Flue gas temperature	1600°F
Content of carbon monoxide Typical content over the cremation	<2.5 grains /s ft^3 (Using natural gas fuel)
Flue gas particulate content (Typically)	<4.5 grains /s ft^3

Gas sampling for combustion control of flue gases is made in the exit duct of the cremator.

All above figures are given at reference conditions of 32F, 1 atm, dry, 11 % vol/vol oxygen

6.9 Cremator Heat Loss

Although fabricated from the highest quality refractory and insulating materials, the cremator will lose heat to its surrounding environment. This heat loss is via convection, from all its surfaces, and is calculated as 38,000Btu/h at maximum.

6.10 Cremator Control / Instruments

Thermocouples

Primary chamber	No 1	Type K - Ni / Cr Element
Secondary chamber outlet	No 1	Type K - Ni / Cr Element
Chimney	No 1	Type K - Ni / Cr Element

Each of the above probes is connected to an indicator mounted on the control panel for visual indication of all process values.

	Manufacturer	Type
Primary chamber pressure controller	Dwyer Digihelic	DH II
Cremator air valve motors	Kromschroder	IC 40 (5)

Facultatieve Technologies has a policy of continuous improvement, and therefore reserve the right to amend this technical specification without prior notice.

Section 9

West Virginia Department of Environmental Protection
Division of Air Quality

Application for NSR Permit

This Section Not Used

Section 10

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
1S	1E	Facultatieve Technologies FT II		100 - 200 lbs./hr Human Remains	New Human Cremator November 2015	Secondary Combustion Chamber

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

Section 11

Attachment J

EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data															
Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m[4])
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
1E	Upward vertical stack	1S		1S	Secondary Combustion Chamber			HCl SO2	0.53 0.53	0.45 0.45	0.53 0.53	0.45 0.45	Gas Gas	ST max of many tests ST max of many tests	186 mg/m³ 36 ppmv
								NO **NO2**	**0.86** **0.026**	**0.74** **0.02**	**0.86** **0.026**	**0.74** **0.02**	**Gas** **Gas**	ST max of many tests EE	123 ppmv 2 ppmv
								CO **VOC**	**0.27** **0.05**	**0.23** **0.05**	**0.27** **0.05**	**0.23** **0.05**	**Gas** **Gas**	ST max of many tests ST max of many tests	41 ppmv 14 ppmv

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, etc. **DO NOT LIST** CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J

EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (^{o}F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
1E	1.5	750	3379	31.9	652 ft.	**Estimated 28 ft**	**4346380.07**	**451924.46**

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

Section 12

Attachment K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☐ Yes ☒ No ☐ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☐ Yes ☒ No ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☐ Yes ☒ No ☐ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered “NO” to all of the items above, it is not necessary to complete the following table, “Fugitive Emissions Summary.”

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads						
Unpaved Haul Roads						
Storage Pile Emissions						
Loading/Unloading Operations						
Wastewater Treatment Evaporation & Operations						
Equipment Leaks		Does not apply		Does not apply		
General Clean-up VOC Emissions						
Other						

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. DO NOT LIST H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

Section 13

Attachment L
Emission Unit Data Sheet
(INCINERATOR)

Control Device ID No. (must match List Form):

Equipment Information

1. Manufacturer: Facultatieve Technologies	2. Model No. FT II SE
3. On a separate sheet sketch or draw the proposed incinerator showing the location and dimensions (inside and out) of (1) the primary combustion chamber, (2) the secondary combustion chamber, (3) the flame port, (4) auxiliary burners, and (5) dampers **with special emphasis on dimensions of the flame port and secondary combustion chambers (inside). Also,** sketch in the minimum distance the gas travels through the secondary combustion chamber.	
4. Rated capacity of the incinerator for the type of waste to be burned: Maximum: 320 lb/hr Typical: 275 lb/hr Annual: 150 tons/yr	
5. By what means is waste charged? ☒ Batch ☐ Continuous ☐ Periodically	
6. Type: ☒ Multiple Chamber ☐ Single Chamber ☐ Other, specify:	
7. Projected operating schedule: 12 hr/day 250 day/yr	

Primary Combustion Chamber

8. Volume: 88 ft^3	9. Effective grate area: 28.6 ft^2
10. Maximum temperature: 2000 °F	11. Burning rate: 2.7 $lb/ft^2/hr$
12. Heat release in primary chamber: 12500 $BTU/hr/ft^3$	13. Total heat release in incinerator: 12800 $BTU/hr/ft^3$

Secondary Combustion Chamber

14. Volume: 113 ft^3	15. Cross sectional area: 3.1 ft^2
16. Volume of gas through secondary combustion chamber: up to 3320 ACFM @ 1600 °F	17. Gas velocity through secondary combustion chamber: 17.3 average at full throughput ft/sec
18. Minimum gas temperature: 1600 °F	19. Minimum retention time of gas: 2 sec
20. Minimum distance of gas travel through secondary combustion chamber: 34 ft	21. Location of air admission: Beginning of secondary chamber in roof

Flame Port

22. Flame port area: 0.102 ft^2	23. Velocity through flame port: 315 ft/sec

Dampers

24. Type: Butterfly	25. Number 5
26. Diameter: 3 & 4 inches	27. Capacity: 1000 ACFM @ 60 °F

Combustion Air

28. Type of draft: ☐ Natural ☐ Sliding damper ☐ Forced ☐ Barametric damper ☒ Induced
Windshielding? ☐ Yes ☐ No

30. Theoretical air/refuse ratio: 6.1 lb air/lb refuse

31. Percent of total air applied as:
variable overfire air
variable underfire air

29. If draft is forced or induced, describe ID fans or blowers:

Number	1	
HP rating	7.5	HP
Rated flow	1200	ft^3/min
Rated speed	3450	RPM
Fan rated draft	25	in. H_2O
Volume	1200 @ 60 F	

Auxiliary Burners

32. Proposed type and fuel: Nozzle Mixed Forced Air Burner - Natural Gas

33. **Primary Burner**
Capacity: 0.85 MMBTU/hr
Number: 1
Manufacture: Facultatieve Technologies
Model: HH VFB
Estimated capacity: 853795 BTU/hr
Fuel: Natural Gas
How controlled? Temperature & PLC Logic
Is there a temperature indicator? ☒ Yes ☐ No

34. **Secondary Burner**
Capacity: 1.2 MMBTU/hr
Number: 1
Manufacture: Facultatieve Technologies
Model: HH VFB
Estimated capacity: 1195310 BTU/hr
Fuel: Natural Gas
How controlled? Temperature & PLC Logic
Is there a temperature indicator? ☒ Yes ☐ No

Miscellaneous Devices and Controls

35. Automatic loading device. ☒ Yes ☐ No
If yes, describe.
Automatic coffin loader- Chain driven

36. Self closing doors. ☒ Yes ☐ No

37. Sparks arrestor ☐ Yes ☒ No

38. Flame failure protection equipment ☒ Yes ☐ No

39. Method of creating turbulence for combustion gases.
Describe.
Multiple changes in direction due to internal baffle walls

40. Method of cleaning secondary or settling chamber.
Describe.
Clean out ports allow rodding & raking of all gas passes

41. Other interlocking devices or controls. If yes, describe. ☒ Yes ☐ No
Maximum temperature for coffin insertion 1380 F - Door interlock
Primary air sequence controlled from programmable logic controller
Secondary air level controlled from measured oxygen concentration at secondary chamber exit

Installation

42. Indoor Installation: ☒ Yes ☐ No

43. Outdoor Installation: ☐ Yes ☒ No

If yes, describe method of supplying combustion air.
Appropriately sized louver in external wall

Stack or Vent Data

44. Inside diameter or dimensions: 1.5 ft	45. Gas exit temperature: 750 °F
46. Height: 28 ft	47. Stack serves: ☒ This equipment only ☐ Other equipment also (submit type and rating of all other equipment exhausted through this stack or vent)
48. Gas flow rate: 3379 ft/min	
49. Estimated percent of moisture: 7.7 %	

Waste

50. Source of waste: ☐ Hospital ☐ Restaurant ☐ Store ☐ Industry ☐ Apartment ☒ Crematory ☐ Warehouse ☐ Public Institution ☐ Other, specify:

51. Describe fully, in detail, the composition of waste feed to the incinerator:
Deceased humans in cardboard cremation containers or wood caskets

52. Expected BTU/lb as fired: 4630 BTU/lb	53. Daily amount: 5 bodies - 875 lb
54. Does incinerator have a charge hopper ☐ Yes ☒ No	55. What is the volume of the charge hopper? N/A ft^3
56. Does the charge hopper have automatic control? ☐ Yes ☐ No NA	57. Is the waste charged to the incinerator weighed? ☐ Yes ☒ No
58. Is the secondary chamber preheated prior to charging waste? ☒ Yes ☐ No	59. At what secondary temperature does waste charging begin? 1600 °F
60. Is the ash waste quenched? ☐ Yes ☒ No	61. Is all the waste burned generated on site? ☐ Yes ☒ No

62. For hospital waste, is the ash inspected for recognizable combustible components? ☐ Yes N/A ☐ No

63. For hospital waste, are recognizable combustible components of the ash reburned? ☐ Yes N/A ☐ No

64. Is any waste received from outside the local government boundary? ☐ Yes N/A ☐ No

65. Are hazardous or special waste burned? ☐ Yes ☒ No If yes, please describe:	66. Are potential infectious waste burned? ☐ Yes ☒ No

67. How will the waste material from process and control equipment be disposed of?
Returned to family of deceased

68. Method of charging waste solids: ☐ Manual ☐ Manual charge hopper ☐ Automatic charge hopper ☒ Other, specify: Automatic coffin loader	69. Method of feeding liquids: ☐ Lab pack ☐ Injection as a primary burner fuel ☐ Injection as a secondary burner fuel ☐ Other, specify: N/A
70. Rated steam flow – heat recovery boiler: N/A lbs/hr	71. Rated pressure – recovery boiler: N/A PSIG

Emissions Stream

72. Emission rates:

Pollutant	Pounds per Hour lb/hr	grain/ACF	@ °F	PSIA	Tons per Year Tons/yr	Parts per Million ppm
CO	up to 0.27	0.008	750	14.7	up to 0.23	41
Hydrocarbons	Part of V.O.C.'s					
NO_x	up to 1.35	0.042	750	14.7	up to 1.15	126
Pb						
PM_{10}	up to 0.3	0.009	750	14.7	up to 0.26	N/A
SO_2	up to 0.53	0.017	750	14.7	up to 0.45	36
VOCs	up to 0.05	0.002	750	14.7	up to 0.05	14
Other (specify) HCl	up to 0.53	0.017	750	14.7	up to 0.45	62
Hg	up to 0.01	0.0004	750	14.7	up to 0.01	0.3

73. If an *Air Pollution Control Device* is not submitted, the emission rates should be the same as those reported home "Maximum Potential and Maximum Actual Emissions" on the *Emission Points Data Summary Sheet*.

74. Emissions rates should be substantiated by submitting *stack test data* and/or *calculations*.

Fuel Usage Data

75. Estimated annual fuel cost: $

76. Firing rate: Maximum: 2 mmBTU/hr
Typical: 2 mmBTU/hr
Design: 2 mmBTU/hr

77. Fuel type: ☒ Natural Gas ☐ Coal ☐ Fuel Oil, No. ☐ Other, specify:

78. Typical heating content of fuel: 1037 BTU/cuft

79. Typical fuel sulfur content: 0 wt. %

80. Typical fuel ash content: 0 wt. %

81. Annual fuel usage: 10000000 cuft

82. Please complete an *Air Pollution Control Device Sheet(s)* for the control(s) used on this Emission Unit, if applicable.

83. Have you included the ***air pollution rates*** on the Emissions Points Data Summary Sheet? Yes

84. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING PLAN: Please list (1) describe the process parameters and how they were chosen (2) the ranges and how they were established for monitoring to demonstrate compliance with the operation of this process equipment operation or air pollution control device.

The Facultatieve Technologies FT II Cremator monitors the rate of cremation based upon the charging weight of the deceased. The machine monitors and displays temperatures in the primary chamber, secondary chamber and exhaust stack. In addition, since our design utilizes a fan to create draft, we constantly monitor the suction throughout the cremator. Lastly, we monitor and adjust the oxygen levels in the primary and Secondary chambers. All of these functions are displayed in "real time" on the "on-board" 15" touchscreen.

TESTING PLAN: Please describe any proposed emissions testing for this process equipment or air pollution control device.

Although emission testing is not required by the Division of Air Quality. However, we understand if requested both stack testing and/or emission testing will be provided.

RECORDKEEPING: Please describe the proposed recordkeeping that will accompany the monitoring.

The on-board computer system that the Facultatieve Technologies FT II cremator utilizes keeps complete records of each cremation including time of start, time of finish, all temperatures in both primary and secondary chambers, operators name and deceased name for each cremation. If desired, the operator can enter reason of death and has the capability to enter additional comments. The reports summary is programmable for each site and can include any information required by federal, state or local agencies.

REPORTING: Please describe the proposed frequency of reporting of the recordkeeping.

Records are kept for each cremation processed in the Facultatieve Technologies FT II cremator. Reports can be issued after each cremation weekly, monthly or yearly. All information is stored on the computer hard drive and any or all of the information is available at any time.

85. Please describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

The Facultatieve Technologies cremator is driven with an on-board computer and programmable logic controller. The software ensures that the machine only operates within the manufacturers design criteria. Password protected software can only be manipulated by Facultatieve Technologies engineers. Facultatieve Technologies provides "real time" monitoring and technical support for all machines by means of a dedicated IP Address. This internet connection is password protected as well, not allowing unauthorized access to the machine. Maintenance of replaceable parts is reviewed during the crematory training which is provided with all machine installations. Service contracts are in place for all FT cremators with bi-yearly factory maintenance provided.

Section 14

West Virginia Department of Environmental Protection
Division of Air Quality

Application for NSR Permit

This Section Not Used

Section 15

Attachment N - Estimated Emissions

Estimated Unabated Pollutants from Cremators

Normalised 0°C 11% O_2 dry basis

Pollutant	Units	AEA Results in UK A	B	C	Use	Mass				lb/h	Grain/Acf	Grain/scf	PPM	lb/1000 lb gas	ton/yr
Dioxin	ng/m³	0.03	0.08	0.03	**0.08**	72	ng/h	209662	ng/yr	1.6E-07	0.0000	0.0000		2.4E-08	2.06E-07
PAH	mg/m³	0.308	0.013	0.01	**0.308**	277	mg/h	807198	mg/yr	0.001	0.0000	0.0001	0	0.0001	0.001
TEQ	ng/m³	0	1	0.03	**1**	900	ng/h	2620773	ng/yr	0.002	0.0001	0.0004		0.0003	0.003
Mercury	mg/m³	0.69	0.88	0.43	**5**	4500	mg/h	13103867	mg/yr	0.010	0.0003	0.0020	0.2	0.0015	0.013
Heavy Metals	mg/m³	0.11	1.41	0.76	**1.41**	1269	mg/h	3695290	mg/yr	0.003	0.0001	0.0006		0.0004	0.004
Particulate	mg/m³	94	104	79	**80**	71999	mg/h	209661868	mg/yr	0.159	0.0055	0.0326		0.0243	0.206
HCl	mg/m³	43	15	38	**200**	179998	mg/h	524154670	mg/yr	0.397	0.0137	0.0814	52	0.0608	0.516
HF	mg/m³	1.2	0.6	0.2	**2**	1800	mg/h	5241547	mg/yr	0.004	0.0001	0.0008	1	0.0006	0.005
SO_x	mg/m³	81	54	76	**100**	89999	mg/h	262077335	mg/yr	0.198	0.0069	0.0407	15	0.0304	0.258
NO_x (as NO_2)	mg/m³	392	267	415	**508**	457195	mg/h	1331352861	mg/yr	1.008	0.0348	0.2068	104	0.1544	1.310
CO	mg/m³	12	78	24	**100**	89999	mg/h	262077335	mg/yr	0.198	0.0069	0.0407	34	0.0304	0.258
VOC	mg/m³	1	2	15	**20**	18000	mg/h	52415467	mg/yr	0.040	0.0014	0.0081	12	0.0061	0.052
NO	mg/m³	(also included in NO_x above)			**325**	292497	mg/h	851751338	mg/yr	0.645	0.0223	0.1323	102	0.0988	0.838
NO_2	mg/m³	(also included in NO_x above)			**10**	9000	mg/h	26207733	mg/yr	0.020	0.0007	0.0041	2	0.0030	0.026

Flue Gas Oxygen	16.78	%v/v dry					
Flue Gas Moisture	8.07	%v/v					
Flue Gas Mass Flow	2961	kg/h	6529	lb/h			
Flue Gas Volume	5741	Am³/h	2333	Nm³/h wet	2145	Nm³/h dry	900 Nm³/h (11%O_2 dry gas)
Flue Gas Temperature	399	°C					569 scfm (11% O2 dry gas at 20°C)

8	hour day	**6**	Cremations per day
7	days per week	42	Cremations per week
52	weeks per year	2184	Cremations per year
2912	hours per year		

Facultatieve Technologies
Cremation & Incineration Equipment

Drawn	Ernie Kassoff	Title
Date	17-July-2015	Estimated Emissions Inventory
Project	FTII	
	Leavitt Funeral Home	XXXX EI 0001

Section 16

Attachment O

Monitoring, Recordkeeping, Reporting and Testing Plans

Monitoring:

The Facultatieve Technologies FT II Cremator monitors the rate of cremation based upon the charging weight of the deceased. The machine monitors and displays temperatures in the primary chamber secondary chamber and exhaust stack. In addition since our design utilizes a fan to create draft we constantly monitor the suction throughout the cremator. Lastly we monitor and adjust the oxygen levels in the primary and secondary chambers. All of these functions are displayed in "real time" on the on-board 15" touch screen and are accessible via internet connection

Recordkeeping:

The on-board computer system that the FT II utilizes keeps complete records of each cremation including time of start, time of finish, all temperatures both in the primary and secondary chambers, operator name for each cremation and deceased name. In addition, if so desired the operator has the option to enter reason for death and has the capability to enter additional comments. The reports summary is programmable for each site and can include any information required by federal, state or local agencies.

Reporting:

Records are kept for each cremation processed in the Facultatieve Technologies FT II Cremator. Reports can be issued after each cremation, weekly, monthly or yearly. All information is stored on the computer hard drive and access to any or all of the information is available at any time. Copies of basic reports from our Operator Training Manual are included within this section

Testing Plans:

Emission testing is not required by the Division of Air Quality, however we understand if requested both stack testing and/or emissions tests will be provided. Please see note below regarding testing report from similar project.

Please Note:

We have attached to this submission, under separate cover, a copy of a full emissions report that was performed on an identical FT II cremator at the Swan Point Cemetery Crematory. Upon completion of the testing the unit was confirmed by the Rhode Island Department of Environmental Management Office of Air Resources and presented a Permit to Operate.

Section 17

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Leavitt Funeral Home, Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Modification Permit for a crematory located at 414 Seventh Street, Parkersburg, in Wood County, West Virginia.

The applicant estimates the increased potential to discharge the following Regulated Air Pollutants will be:

Particulate Matter (PM_{10})	up to 0.147 tons per year
Carbon monoxide (CO)	up to 0.184 tons per year
Nitrogen Oxide (NO_X)	up to 0.936 tons per year
Sulfer Dioxide (SO_2)	up to 0.184 tons per year
Hydrocarbons (part of VOC)	up to 0.037 tons per year
Hydrogen Chloride (HCl)	up to 0.368 tons per year
Mercury (Hg)	up to 0.009 tons per year

Startup of operation is planned to begin on or about the 16th day of November, 2015. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1250, during normal business hours.

Dated this the ___ day of _____, 2015

By: Leavitt Funeral Home, Inc.
Jonathan C. Leavitt
President
403 Seventh Street
Parkersburg, WV 26101

Section 18

West Virginia Department of Environmental Protection
Division of Air Quality

Application for NSR Permit

This Section Not Used

Section 19

West Virginia Department of Environmental Protection
Division of Air Quality

Application for NSR Permit

This Section Not Used

Section 20

West Virginia Department of Environmental Protection
Division of Air Quality

Application for NSR Permit

This Section Not Used

Section 21

EPA Stack Test

Custom Stack Analysis, LLC.

1-800-824-4274

Swan Point Cemetery
585 Blackstone Boulevard
Providence, Rhode Island 02906

Report

Performed Velocity, Moisture, Temperature, Volumetric Flow Rate, Particulate, Oxygen, Carbon Dioxide, Chromium and Carbon Monoxide Emissions Testing

Sampling performed on the FTC Model FT II SE Human Crematory and Model FT III Human Crematory Outlets

Providence, RI

Test Date: 2/5/15 & 2/6/15

Swan Point Cemetery
585 Blackstone Boulevard
Providence, Rhode Island 02906

Report

Performed Velocity, Moisture, Temperature, Volumetric Flow Rate, Particulate, Oxygen, Carbon Dioxide, Chromium and Carbon Monoxide Emissions Testing

Sampling performed on the FTC Model FT II SE Human Crematory and Model FT III Human Crematory Outlets

Providence, RI

Test Date: 2/5/15 & 2/6/15

3/16/2015

X

Signed by: customstack

Brian E. Lemasters
Custom Stack Analysis, LLC.

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EXECUTIVE SUMMARY

Custom Stack Analysis, LLC. conducted emissions sampling using USEPA Methods 1-5, 3A, 10 and 29. Testing was conducted on the Facultatieve Technologies Crematory (FTC) Model FT II SE Human Crematory and Model FT III Human Crematory Outlets at Swan Point Cemetery, located at 585 Blackstone Boulevard, Providence, RI 02906 on Feburary 5th & 6th, 2015 for initial compliance and engineering purposes with the below emission limits specified as a condition of the Minor Source Permit Approval Nos. 2242 and 2243, issued by the Office of Air Resources (OAR) on January 21st, 2014. The Custom Stack Analysis, LLC. test crew consisted of Mr. James Gray, Mr. Jonathan Augustein and Mr. Brian Lemasters. The testing procedures were coordinated by Mr. Anthony Hollingshead and Mr. Bill Laramee of Swan Point Cemetery and Mr. Derek Wilce and Mr. Andy Scadding of Facultatieve Technologies, Inc.

Pollutant	Emission Limitations	Test Result Average	Compliance Demonstrated
Particulate	0.08 gr/dscf @ 12% CO2 (two hour max average)	**Unit #1** 0.05 gr/dscf @ 12% CO2 **Unit #2** 0.04 gr/dscf @ 12% CO2	Yes Yes
Carbon Monoxide	100 ppm @ 7% O2 (one hour average)	< 10 ppm @ 7% O2 for any one hour average	**Unit #1** Yes **Unit #2** Yes

A description of the testing protocol is included on pages 4-9. All testing calculations are located on pages 13-26. Appendix 1 includes field test data. Appendix 2 contains laboratory data from Custom Stack Analysis, LLC. Appendix 3 contains calibration data for the equipment used on test day. Appendix 4 contains monitoring data. Appendix 5 contains process data. Test results are located on pages 2-3.

Test Results

Swan Point Cemetery - FTC Model FT II SE Human Crematory Outlet
2/5/2015
Methods 1-5, 3A & 10

		Run #1	Run #2	Run #3	Run #4
Stack Gas Velocity (ft/sec)		31.13	30.80	27.93	29.95
Standard Cubic Feet an Hour		81,602	78,436	71,750	77,263
Actual Cubic Feet per Minute		3,301	3,265	2,962	3,176
Stack Temperature (F)		740	775	770	762
Moisture % (Measured)		5.73%	5.73%	5.26%	5.57%
Isokinicity %		96.9%	96.4%	95.8%	96.4%
Carbon Dioxide %		3.09%	2.96%	2.97%	3.01%
Oxygen 1st Hour %		16.19%	16.26%	16.20%	16.22%
Oxygen 2nd Hour %		16.27%	16.46%	16.64%	16.88%
Nitrogen 1st Hour %		80.72%	80.78%	80.83%	80.78%
Nitrogen 2nd Hour %		80.64%	80.58%	80.39%	80.18%
Particulate	**(lbs/hr)**	0.0856	0.1837	0.1449	0.1890
Particulate	**(gr/dscf)**	0.00735	0.01640	0.01414	0.01512
Particulate	**(lbs/dscf)**	1.05E-06	2.34E-06	2.02E-06	2.16E-06
Particulate	**(gr/dscf @12%CO2)**	0.02856	0.06645	0.05716	0.06157
CO 1st Hour	**(ppm)**	1.85	0.76	0.78	0.87
	(lbs/hr)	0.0109	0.0072	0.0066	0.0091
	(ppm @7%O2)	5.445	2.289	2.295	2.563
CO 2nd Hour	**(ppm)**	1.38	0.06	0.00	0.01
	(lbs/hr)	0.0082	0.0003	0.0000	0.0001
	(ppm @7%O2)	4.147	0.184	0.000	0.033
Method 29					
Chromium	**(mg/dscm)**	0.0219	0.0098	0.0123	0.0099
	(mg/dscm @7%O2)	0.0647	0.0294	0.0364	0.0290
	(lbs/dscf)	1.37E-09	6.13E-10	7.69E-10	6.18E-10
	(lbs/hr)	1.12E-04	4.81E-05	5.52E-05	5.41E-05

Test Results

Swan Point Cemetery - FTC Model FT III SE Human Crematory Outlet
2/6/2015
Methods 1-5, 3A & 10

		Run #1	Run #2	Run #3	Avg.
Stack Gas Velocity (ft/sec)		30.92	29.78	29.82	30.17
Standard Cubic Feet an Hour		87,723	84,176	82,996	84,965
Actual Cubic Feet per Minute		3,279	3,157	3,162	3,199
Stack Temperature (F)		670	676	697	681
Moisture % (Measured)		4.76%	4.57%	4.30%	4.54%
Isokinicity %		95.2%	96.2%	95.9%	95.8%
Carbon Dioxide %		2.72%	2.89%	2.59%	2.73%
Oxygen 1st Hour %		17.01%	16.83%	16.98%	16.94%
Oxygen 2nd Hour %		17.09%	16.94%	17.37%	17.14%
Nitrogen 1st Hour %		80.28%	80.27%	80.44%	80.33%
Nitrogen 2nd Hour %		80.19%	80.16%	80.04%	80.13%
Particulate	**(lbs/hr)**	0.1226	0.1024	0.1297	0.1182
Particulate	**(gr/dscf)**	0.00978	0.00852	0.01094	0.00975
Particulate	**(lbs/dscf)**	1.40E-06	1.22E-06	1.56E-06	1.39E-06
Particulate	**(gr/dscf @12%CO2)**	0.04319	0.03533	0.05077	0.04310
CO 1st Hour	**(ppm)**	2.05	2.07	0.86	1.66
	(lbs/hr)	0.0130	0.0127	0.0052	0.0103
	(ppm @7%O2)	7.308	7.081	3.045	5.811
CO 2nd Hour	**(ppm)**	0.42	0.48	0.47	0.45
	(lbs/hr)	0.0026	0.0029	0.0028	0.0028
	(ppm @7%O2)	1.516	1.680	1.839	1.679

METHOD 1

Sample and velocity traverses for stationary sources.

To aid in the representative measurement of pollutant emissions and/ or total volumetric flow rate from a stationary source, a measurement site where the effluent stream is flowing in a known direction is selected, and the cross-section of the stack is divided into a number of equal areas. A traverse point is then located within each of these equal areas.

METHOD 2

Determination of stack gas velocity and volumetric flow rate.

The average gas velocity in a stack is determined from the gas density and from measurement of the average velocity head with a Type S (Stausscheibe or reverse type) pitot tube.

METHOD 3

Gas analysis for the determination of dry molecular weight.

This method is applicable for determining carbon dioxide and oxygen concentrations and dry molecular weight of a sample from a gas stream of a fossil-fuel combustion process.

METHOD 4

Determination of moisture content in stack gases.

A gas sample is extracted at a constant rate from the source. It is determined either volumetrically or gravimetrically.

METHOD 3A TESTING DESCRIPTION

A gas sample is continuously extracted from the stack, and a portion of the sample is conveyed to an instrumental analyzer for determination of O2 gas concentration. The gases pass through a heated sampling probe and filter to prevent condensation. The gases then pass through a calibration valve to a heated sampling line. After the heated sampling line is a Universal Analyzers Model 530 air cooled single sample thermoelectric water condenser with a perostolic pump for moisture removal. The sample is then passed through to a California Analytical Instruments Model 100F for O2 concentrations. Before the testing procedures commence the analyzer is left to warm up for a 90 minute period. It is then calibrated according to Method 7E specifications. To the extent practicable, the measured emissions should be between 20 to 100 percent of the selected calibration span. Three calibration gases are selected. The High-Level gas concentrations shall be equivalent to 20 to 100 percent of the calibration span. Mid-Level concentrations shall be equivalent to 40 to 60 percent of the calibration span. The Low-Level Gas concentrations of less than 20 percent of the span. Before the first run an analyzer calibration error check is conducted. If the low-level, mid, or high cal gases expected concentrations differ by more than +-2% of the span then the procedure needs to be repeated until an acceptable 3 point calibration is obtained. After the analyzer calibration check the upscale and low level calibration gases are introduced to the sampling calibration valve and recorded. System bias calibration must be within 5.0% of the analyzer calibration span for low-scale and upscale calibration gases. At the conclusion of each of the test runs the low-level gas and an upscale gas closest to the concentrations are introduced to the calibration valve assembly. If either the low-level or upscale value exceeds +-3% of the span, then the run is considered invalid.

METHOD 5 TESTING DESCRIPTION

Particulate samples were collected following EPA Methods 1-5. The equipment used for testing consisted of a Custom Stack Analysis Stack Train Sampler (EPA type). A type “S” pitot and a heated sampling probe were used with the sampling train. All equipment was calibrated in the laboratory prior to the test. The sampling nozzle and the pitot tubes were measured on the day of the test. All calibrations can be found in the appendix. The dust laden gases are passed through a heated pyrex probe and a heated glass four inch filter holder containing Gelman Type A-E fiberglass filter media. The gases leaving the filter were collected in a series of four impingers packed in ice. The first, third, and fourth impingers were the modified Greenburg-Smith type and the second one was a standard Greenburg-Smith type. The first and second impinger contained 100 ml of distilled water. After leaving the third and fourth empty impingers the gases passed through a “Drierite” column containing about 500 grams of indicating silica gel to remove any remaining water vapor. The dry gas then passed through the hose portion of the umbilical cord to a Custom Stack Analysis Model #3000 “Stacksampler” module. In the module the gas was moved through the system by a leakless air pump to a Rockwell 175-S dry test meter. The dry test meter exhausted to a calibrated orifice to measure the flow rate of the gases passing through the sampling apparatus. A type “S” pitot tube was attached to the sheath of the heated probe and nozzle. The orifice pressure taps and the pitot tube were connected to a Dwyer duel 10 inch combination inclined-well type manometer. One half of the manometer measured the orifice differential pressure (^H) and the other half measured the flue gas velocity head (^P). The temperature of the flue gas was measured by a type “K” thermocouple connected to a Marlin Digital Temperature controller. The $C0_2$ and 0_2 levels were analyzed using a CAI 300 analyzer.

METHOD 10 TESTING DESCRIPTION

A gas sample is continuously extracted from the stack, and a portion of the sample is conveyed to an instrumental analyzer for determination of CO gas concentration using a Luft-type nondispersive infrared analyzer. The gases pass through a heated sampling probe and filter to prevent condensation. The gases then pass through a calibration valve to a heated sampling line. After the heated sampling line is a Universal Analyzers Model 530 air cooled single sample thermoelectric water condenser with a perostolic pump for moisture removal. The sample is then passed through an ascarite tube to a Thermo Environmental Instruments Model 48 Luft-type analyzer where the gases are analyzed for CO concentrations. Before the testing procedures commence the analyzer is left to warm up for a 90 minute period. It is then calibrated according to Method 7E specifications. To the extent practicable, the measured emissions should be between 20 to 100 percent of the selected calibration span. Three calibration gases are selected. The High-Level gas concentrations shall be equivalent to 20 to 100 percent of the calibration span. Mid-Level concentrations shall be equivalent to 40 to 60 percent of the calibration span. The Low-Level Gas concentrations of less than 20 percent of the span. Before the first run an analyzer calibration error check is conducted. If the low-level, mid, or high cal gases expected concentrations differ by more than +-2% of the span then the procedure needs to be repeated until an acceptable 3 point calibration is obtained. After the analyzer calibration check the upscale and low level calibration gases are introduced to the sampling calibration valve and recorded. System bias calibration must be within 5.0% of the analyzer calibration span for low-scale and upscale calibration gases. At the conclusion of each of the test runs the low-level gas and an upscale gas closest to the concentrations are introduced to the calibration valve assembly. If either the low-level or upscale value exceeds +-3% of the span, then the run is considered invalid.

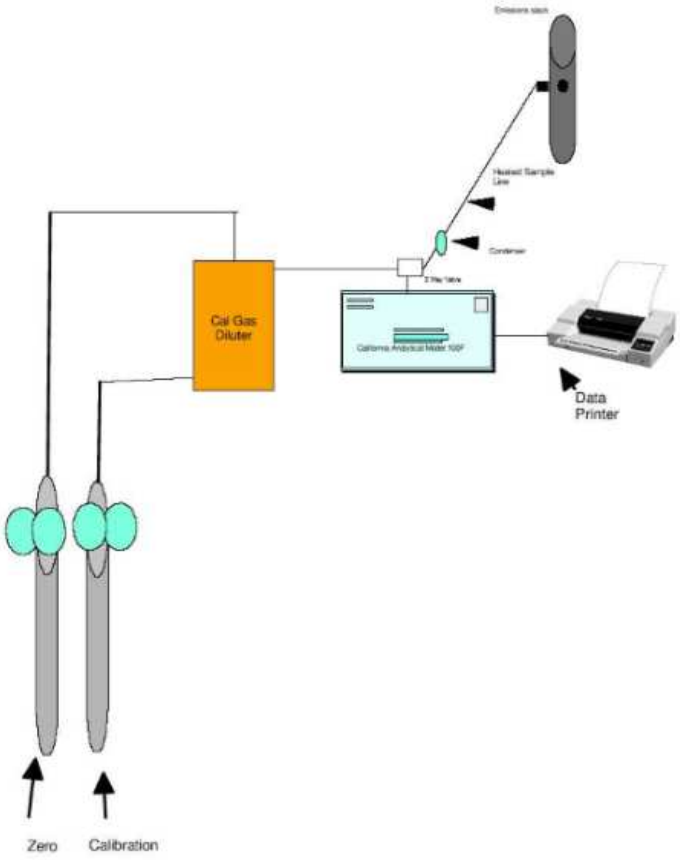
METHOD 29 TESTING DESCRIPTION

Samples were collected following EPA Method 29. Each point was sampled for 10 minutes for a total of a 120 minute test. The equipment used for testing consisted of a Burrell Model B orsat analyzer and a Alliance Pollution Control Stack Train Sampler (EPA type). A type "S" pitot and a heated sampling probe was used with the sampling train. All equipment was calibrated in the laboratory prior to the test. The sampling nozzle and the pitot tubes were measured on the day of the test. All calibrations can be found in the appendix. The gases are passed through a heated pyrex probe and a heated glass four inch filter holder containing Gelman Type A-E fiberglass filter media. The gases leaving the filter were collected in a series of six impingers packed in ice. The first, second, fourth, fifth, and sixth impingers were the modified Greenburg-Smith type and the third one was a standard Greenburg-Smith type. The first impinger is left empty. The second and third impinger contained 100 ml each of HNO_3 / H_2O_2. The gases then pass through the fourth impinger which is left empty. After leaving the fourth impinger the gases passed through a fifth and sixth impinger containing 100 ml each of acidified KMnO4. They then pass through a "Drierite" column containing about 500 grams of calcium sulfate (CaSO4) desicant to remove any remaining water vapor. The dry gas then passed through the hose portion of the umbilical cord to an Alliance Pollution Control "Stack Sampler" module. In the module the gas was moved through the system by a leakless air pump to a Rockwell 175-S dry test meter. The dry test meter exhausted to a calibrated orifice to measure the flow rate of the gases passing through the sampling apparatus. A type "S" pitot tube was attached to the sheath of the heated probe and nozzle. The orifice pressure taps and the pitot tube were connected to a Dwyer dual 10 inch combination inclined-well type manometer. One half of the manometer measured the orifice differential pressure (^H) and the other half measured the flue gas velocity head (^P). The temperature of the flue gas was measured by a type "K" thermocouple connected to a Marlin digital temperature controller. The $C0_2$ and 0_2 levels were collected into teddlar bags and brought back to the laboratory for orsat analysis. Sampling train recovery was conducted as follows: Container No. 1 contained the filter. Container No. 3 contained the probe nozzle, probe fitting, probe liner, and front half of the filter holder with 100 ml of 0.1 N HNO_3. Container No. 4 consisted of impingers 1 through 3, connecting glassware and back half of filter holder being rinsed with 100 ml of 0.1 N HNO_3. Container No. 5A was the fourth impinger being rinsed with 100 ml of 0.1 N HNO_3. Container No. 5B consisted of the fifth and sixth impinger with acidified $KmnO_4$ being rinsed three times with a total of 100 ml of acidified $KmnO_4$. They are then rinsed with 100 ml of water. Container No.

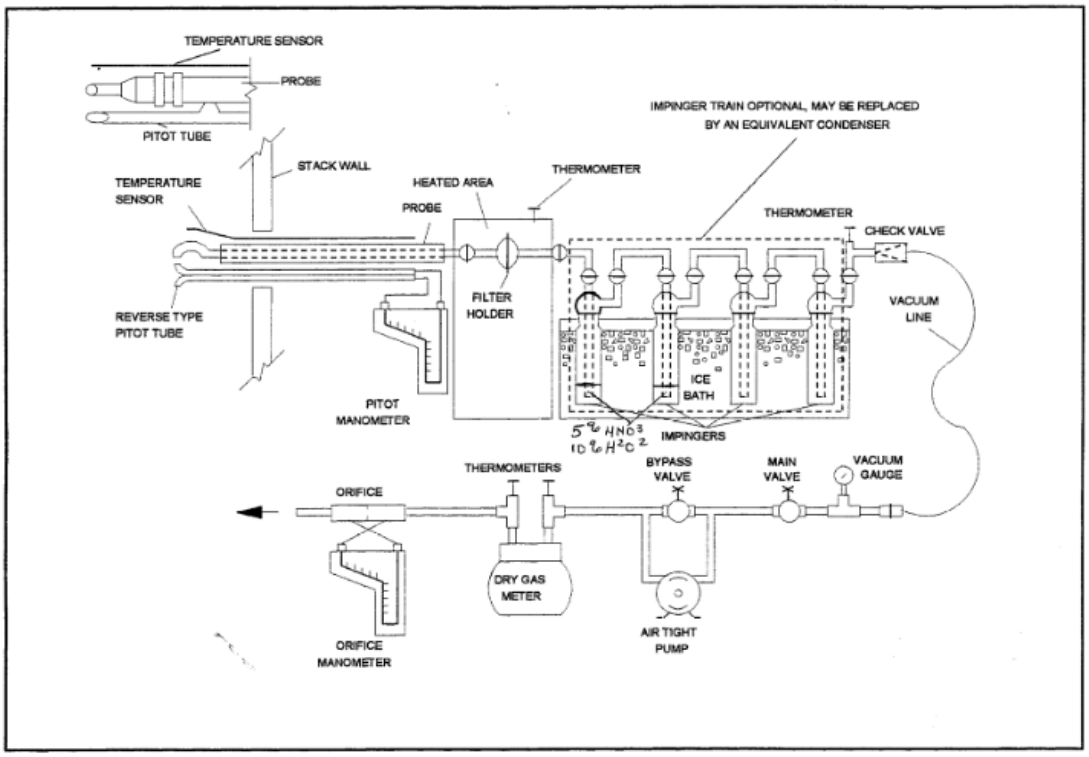
METHOD 29 TESTING DESCRIPTION CONT.

5C was the fifth and sixth impinger being rinsed with 25ml of 8 N HCL to remove any remaining deposits. The container is initially filled with 200 ml of water. Container No. 6 contains the spent calcium sulfate. Container No. 8A contained 300 ml of 0.1 N Nitric acid solution used in the sample recovery. Container No. 8B contained 100 ml of distilled water used in the sample recovery. Container No. 9 contained 200 ml of fresh Hn03/H2O2 solution that was used in the impingers. Container No. 10 contained 100 ml of fresh acidified potassium permanganate solution. Container No. 11 contained 200 ml of distilled water plus 25 ml of 8N HCL. Container No. 12 contained 3 unused blank filters from the same lot as the sampling filters.

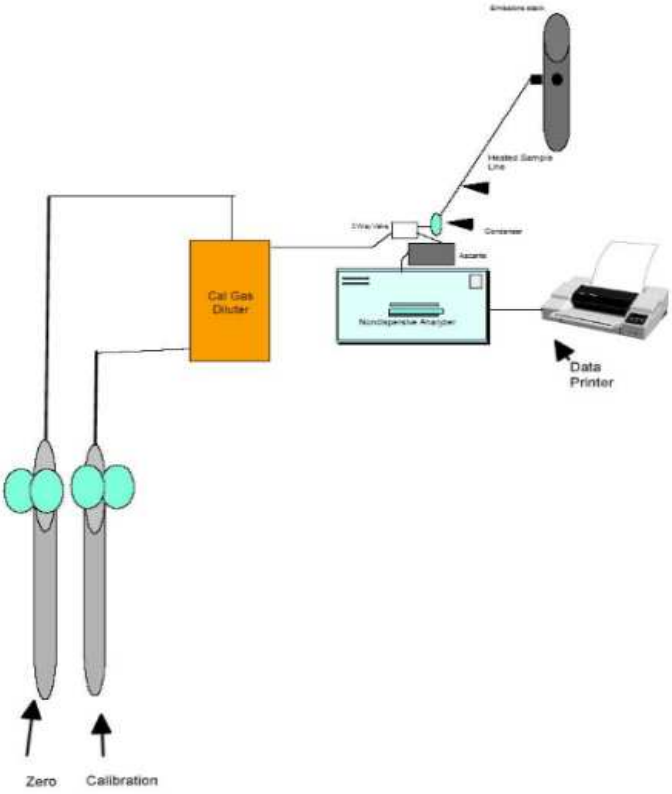
3A Sampling System



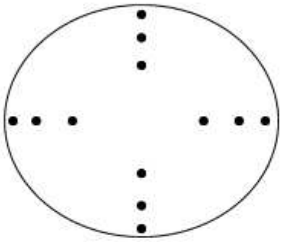
29 Sampling System



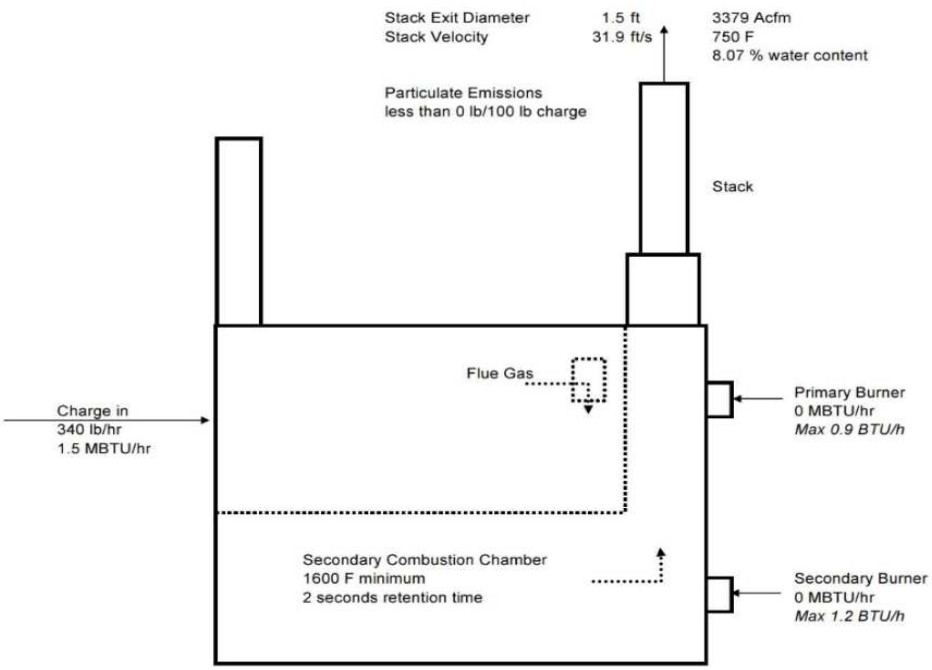
10 Sampling System



Location of Sampling Points



Location:		FTC Model FT II SE Human Crematory & FTC Model FT III Human Crematory Outlets		
Upstream		36"		
Downstream		180"		
Stack Diameter	1	18"	0.8	Inches
Sample Point #	2		2.6	
	3		5.3	Inches
	4		12.7	
	5		15.4	
	6		17.2	



Normal Operating Condition

Energy from charge	1.5 MBTU/hr
Energy from Primary Burner	0 MBTU/hr
Energy from Secondary Burner	0 MBTU/hr
Total Energy	1.5 MBTU/hr

Facultatieve Technologies
Cremation & Incineration Equipment

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Drawn	Ernie Kassoff	Title	FT III
Date	11th June 2013		Process Flow Diagram
Project			Normal Operating Condition
	Swan Point Crematory	Drg No	XXXX PFD 0001

CALCULATIONS

FT II Outlet Methods 1-5, 3A & 10

		RUN #1	RUN #2	RUN #3	RUN #4		
1.	**Vm (std)**	86.04	82.32	74.84	92.10	=	$VM * 17.64 * \frac{PBAR + \frac{\wedge H}{13.6}}{Tm} * Y$

			RUN #1	RUN #2	RUN #3	RUN #4
Vm (std)	= Volume of gas collected, corrected to standard conditions, cuft.	=	86.04	82.32	74.84	92.10
Vm	= Volume of gas sampled at meter box, cuft.	=	86.44	82.81	75.92	92.45
17.64	= Standard temperature, 528 Rankine / std pressure, 29.92.	=	17.64	17.64	17.64	17.64
Tm	= Average dry gas meter temperature, + 460 Rankine.	=	524.1	524.6	528.7	524.0
Pbar	= Barometric pressure, inches of mercury (Hg)	=	29.71	29.71	29.71	29.71
^H	= Average pressure differential across orifice.	=	1.71	1.56	1.30	1.99
13.6	= Specific gravity of mercury.	=	13.6	13.6	13.6	13.6
Y	= Calibration factor of meter box.	=	0.9912	0.9912	0.9912	0.9912

		RUN #1	RUN #2	RUN #3	RUN #4		
2.	**Vw (std)**	5.23	5.00	4.16	4.98	=	$Vlc * \frac{P\ H20}{Mh20} * \frac{R\ Tstd}{Pstd} = K2 * Vlc$

			RUN #1	RUN #2	RUN #3	RUN #4
Vlc	= Volume of water and silica colected.	=	111	106.2	88.2	105.6
P H20	= Density of water, 0.002201 lb/ml.	=	0.002201	0.002201	0.002201	0.0022
M H20	= Molecular weight of water, 18.01 lb/lb-mole.	=	18.01	18.01	18.01	18.01
R	= Ideal gas constant, 21.85 in. hg - ft3/R-lb-mole.	=	21.85	21.85	21.85	21.85
Tstd	= Standard absolute temperature, 528 R.	=	528	528	528	528
Pstd	= Standard absolute pressure, 29.92 in. Hg.	=	29.92	29.92	29.92	29.92
K2	= 0.0471 ft3 / ml.	=	0.0471	0.0471	0.0471	0.0471

		RUN #1	RUN #2	RUN #3	RUN #4		
3.	**Bws**	0.0573064	0.0573055	0.0526139	0.0512606	=	$\frac{Vw(std)}{Vm(std) + Vw(std)}$

			RUN #1	RUN #2	RUN #3	RUN #4
Bws	= Water vapor in the gas stream, proportion.	=	0.0573064	0.0573055	0.0526139	0.0513
Vw(std)	= Volume of water vapor in the gas sample, scf.	=	5.23	5.00	4.16	4.98
Vm(std)	= Volume of gas sampled at meter box, scf.	=	86.04	82.32	74.84	92.10

		RUN #1	RUN #2	RUN #3	RUN #4		
4.	**Md**	29.141476	29.124277	29.122844	29.11784	=	0.44 (%CO2) + 0.32 (%O2) + 0.28 (%N2) + %CO)

			RUN #1	RUN #2	RUN #3	RUN #4
Md	= Dry molecular weight, lb / lb-mole.	=	29.141476	29.124277	29.122844	29.118
0.44	= Molecular weight of CO2 divided by 100.	=	0.44	0.44	0.44	0.44
0.32	= Molecular weight of O2 divided by 100.	=	0.32	0.32	0.32	0.32
0.28	= Molecular weight of N2 or CO divided by 100.	=	0.28	0.28	0.28	0.28

Co2, O2, N2, and CO are in percent by volume, dry basis.

		RUN #1	RUN #2	RUN #3	RUN #4		
5.	**Ms**	28.50	28.49	28.54	28.55	=	Md * (1-Bws) + M H20 * (Bws)

			RUN #1	RUN #2	RUN #3	RUN #4
Ms	= Molecular weight of gas , wet basis, lb /lb-mole.	=	28.50	28.49	28.54	28.55
M H20	= Molecular weight of water, 18 lb / lb-mole.	=	18	18	18	18

		RUN #1	RUN #2	RUN #3	RUN #4		
6.	**Vs**	31.13	30.80	27.93	34.65	=	$85.49 * Cp * \sqrt{\wedge p} * \sqrt{\frac{Ts + 460}{Ps * Ms}}$

			RUN #1	RUN #2	RUN #3	RUN #4
Vs	= Average stack gas velocity, ft / sec.	=	31.13	30.80	27.93	34.65
85.49	= Pitot tube constant, ft / sec.	=	85.49	85.49	85.49	85.49
Cp	= Pitot tube coefficient, dimensionless.	=	0.84	0.84	0.84	0.84
^P	= Velocity head of stack gas, avg. sq rt.	=	0.364	0.355	0.323	0.397
Ts	= Temperature of stack gas, + 460 (Rankine).	=	1199.8	1234.8	1230.4	1253.1
Ps	= Absolute stack gas pressure, barometric + static.	=	29.72	29.72	29.72	29.72
Ms	= Molecular weight of stack gas, wet basis.	=	28.50	28.49	28.54	28.55

		RUN #1	RUN #2	RUN #3	RUN #4		
7.	**ACFM**	3301	3265	2962	3674	=	Stack Area * 60 * Vs

			RUN #1	RUN #2	RUN #3	RUN #4
Vs	= Average stack gas velocity, ft / sec.	=	31.13	30.80	27.93	34.65

		RUN #1	RUN #2	RUN #3	RUN #4		
8.	**Isokinicity**	96.9	96.4	95.8	96.7	=	$\frac{K4 * Ts * Vmstd}{Ps * Vs * An * Min * (1-Bws)}$

		RUN #1	RUN #2	RUN #3	RUN #4
K4 = 0.09450 for English units.	=	0.0945	0.0945	0.0945	0.0945
Ts = Stack temperature + 460 R.	=	1199.8	1234.8	1230.4	1253.1
Vmstd = Volume of gas collected, scf.	=	86.04	82.32	74.84	92.10
Ps = Stack pressure, inches Hg.	=	29.72	29.72	29.72	29.72
Vs = Stack velocity, ft / sec.	=	31.13	30.80	27.93	34.65
An = Area of the sampling nozzle, cuft.	=	0.0009621	0.0009621	0.0009621	0.001
Min. = Minutes of test	=	120	120	120	120
Bws = Water vapor in the gas stream, proportion.	=	0.0573064	0.0573055	0.0526139	0.0513

		RUN #1	RUN #2	RUN #3	RUN #4		
9.	**Lbs/Hr**	0.09	0.18	0.14	0.19	=	$2.205 * E-6 * \frac{Mn}{Vm\ std} * scfh$

			RUN #1	RUN #2	RUN #3	RUN #4
2.205 * E-6	=	Conversion from mg to lbs.	=	2.205 * E-6	2.205 * E-6	2.205 * E-6	2.205 * E-
Mn	=	Weight gain of filter and wash minus blank.	=	41.05	87.65	68.7	90.4
scfh	=	Standard stack volumetric flow rate.	=	81602	78436	71750	87514
Vm std	=	Volume of air sampled at stp.	=	86.04	82.32	74.84	92.10

		RUN #1	RUN #2	RUN #3	RUN #4		
10.	**Gr/Dscf**	0.00735	0.01640	0.01414	0.01512	=	$0.0154 * \frac{Mn}{Vmstd}$

			RUN #1	RUN #2	RUN #3	RUN #4
0.0154	=	Conversion to grains from mg.	=	0.0154	0.0154	0.0154	0.0154
Vm std	=	Volume of air sampled at stp.	=	86.04	82.32	74.84	92.10
Mn	=	Weight gain of filter and wash minus blank.	=	41.05	87.65	68.7	90.4

		RUN #1	RUN #2	RUN #3	RUN #4		
11	**Gr/Dscf @ 12% CO2**	0.0285606	0.0664455	0.0571582	0.0615715	=	$Cr = Cm * \frac{r}{m}$

							RUN #1	RUN #2	RUN #3	RUN #4
Cm	=	measured concentration in a dry gas having m				=	0.00735	0.01640	0.01414	0.01512
r	=	corrected concentration in a dry gas having a specified reference volume % CO2				=	12	12	12	12
m	=	measured volume % CO2 in a dry gas				=	3.09	2.96	2.97	2.95

		RUN #1	RUN #2	RUN #3	RUN #4		
12	**SCFH**	81602	78436	71750	87514	=	$3600 * (1 - Bws) * Vs * A * \frac{Tstd}{Ts} * \frac{Ps}{Pstd}$

							RUN #1	RUN #2	RUN #3	RUN #4
3600	=	Seconds per hour.				=	3600	3600	3600	3600
Bws	=	Water vapor in the gas stream, proportion.				=	0.0573064	0.0573055	0.0526139	0.0513
A	=	Area of stack in sq ft.				=	1.7671459	1.7671459	1.7671459	1.7671
Tstd	=	Standard absolute temperature, 528 R.				=	528	528	528	528
Pstd	=	Standard absolute pressure, 29.92 in. Hg.				=	29.92	29.92	29.92	29.92
Ts	=	Temperature of stack gas, + 460 (Rankine).					1199.8	1234.8	1230.4	1253.1
Ps	=	Absolute stack gas pressure, barometric + static.					29.71	29.71	29.71	29.71
Vs	=	Average stack gas velocity, ft / sec.					31.13	30.80	27.93	34.65

CALCULATIONS

CO 1st Hour

		RUN #1	RUN #2	RUN #3	RUN #4		
1.	**Lbs/Hr**	0.011	0.007	0.007	0.009	=	.726 * SCFH * PPM * 10^- 7

				RUN #1	RUN #2	RUN #3
scfh	=	Standard stack volumetric flow rate.	=	81602	78436	71750
PPM	=	PPM corrected	=	1.85	0.76	0.78

		RUN #1	RUN #2	RUN #3	RUN #4		
2	**PPM Corr.**	1.85	0.76	0.78		=	Cgas = (C - Co) Cma / (Cm - Co)

				RUN #1	RUN #2	RUN #3
Co	=	Average of initial and final system calibration bias check responses for the zero gas, ppm.	=	0.12	0.12	0.12
C	=	Effluent gas concentration, dry basis, ppm.	=	1.99	0.90	0.92
Cm	=	Average of initial and final system calibration bias check responses for the upscale gas, ppm.	=	26.345	26.55	26.795
Cma	=	Actual concentration of the upscale calibration gas, ppm.	=	25.88	25.88	25.88

		RUN #1	RUN #2	RUN #3	RUN #4		
3	**PPM @ 7% 02**	5.45	2.29	2.30		=	PPM * 13.9 / (20.9 - 02)

				RUN #1	RUN #2	RUN #3
02	=	Oxgen	=	16.189	16.262	16.199
PPM	=	PPM	=	1.845	0.764	0.776

CALCULATIONS

CO 2nd Hour

	RUN #1	RUN #2	RUN #3	RUN #4		
Lbs/Hr	0.00818	0.00033	0.00000	0.00006	=	.726 * SCFH * PPM * 10^- 7

				RUN #1	RUN #2	RUN #3	RUN #4
scfh	=	Standard stack volumetric flow rate.	=	81602	78436	71750	87514
PPM	=	PPM	=	1.38	0.06	0.00	0.01

	RUN #1	RUN #2	RUN #3	RUN #4		
PPM Corr.	1.382	0.059	0.000	0.010	=	$Cgas = (C - Co) \frac{Cma}{Cm - Co}$

				RUN #1	RUN #2	RUN #3	RUN #4
Co	=	Average of initial and final system calibration bias check responses for the zero gas, ppm.	=	0.12	0.12	0.12	0.12
C	=	Effluent gas concentration, dry basis, ppm.	=	1.52	0.18	0.12	0.13
Cm	=	Average of initial and final system calibration bias check responses for the upscale gas, ppm.	=	26.345	26.55	26.795	27.08
Cma	=	Actual concentration of the upscale calibration gas, ppm.	=	25.88	25.88	25.88	25.88

	RUN #1	RUN #2	RUN #3	RUN #4		
PPM @ 7% 02	4.15	0.18	0.00	0.03	=	PPM * 13.9 / (20.9 - 02)

				RUN #1	RUN #2	RUN #3	RUN #4
02	=	Oxgen	=	16.27	16.46	16.64	16.88
PPM	=	PPM	=	1.38	0.06	0.00	0.01

CALCULATIONS

FT III Outlet Methods 1-5, 3A & 10

		RUN #1	RUN #2	RUN #3		
1.	**Vm (std)**	90.84	88.16	86.63	=	$VM * 17.64 * \frac{PBAR + \frac{\hat{}H}{13.6}}{Tm} * Y$

			RUN #1	RUN #2	RUN #3
Vm (std)	= Volume of gas collected, corrected to standard conditions, cuft.	=	90.84	88.16	86.63
Vm	= Volume of gas sampled at meter box, cuft.	=	91.77	89.39	87.26
17.64	= Standard temperature, 528 Rankine / std pressure, 29.92.	=	17.64	17.64	17.64
Tm	= Average dry gas meter temperature, + 460 Rankine.	=	531.9	533.6	530.1
Pbar	= Barometric pressure, inches of mercury (Hg)	=	29.97	29.97	29.97
^H	= Average pressure differential across orifice.	=	1.96	1.75	1.72
13.6	= Specific gravity of mercury.	=	13.6	13.6	13.6
Y	= Calibration factor of meter box.	=	0.9912	0.9912	0.9912

		RUN #1	RUN #2	RUN #3		
2.	**Vw (std)**	4.54	4.22	3.90	=	$Vlc * \frac{P\ H20}{Mh20} * \frac{R\ Tstd}{Pstd} = K2 * Vlc$

			RUN #1	RUN #2	RUN #3
Vlc	= Volume of water and silica colected.	=	96.4	89.5	82.7
P H20	= Density of water, 0.002201 lb/ml.	=	0.002201	0.002201	0.002201
M H20	= Molecular weight of water, 18.01 lb/lb-mole.	=	18.01	18.01	18.01
R	= Ideal gas constant, 21.85 in. hg - ft3/R-lb-mole.	=	21.85	21.85	21.85
Tstd	= Standard absolute temperature, 528 R.	=	528	528	528
Pstd	= Standard absolute pressure, 29.92 in. Hg.	=	29.92	29.92	29.92
K2	= 0.0471 ft3 / ml.	=	0.0471	0.0471	0.0471

		RUN #1	RUN #2	RUN #3		
3.	**Bws**	0.0476262	0.0456526	0.0430491	=	$\frac{Vw(std)}{Vm(std) + Vw(std)}$

			RUN #1	RUN #2	RUN #3
Bws	= Water vapor in the gas stream, proportion.	=	0.0476262	0.0456526	0.0430491
Vw(std)	= Volume of water vapor in the gas sample, scf.	=	4.54	4.22	3.90
Vm(std)	= Volume of gas sampled at meter box, scf.	=	90.84	88.16	86.63

		RUN #1	RUN #2	RUN #3		
4.	**Md**	29.115075	29.136075	29.09294	=	0.44 (%CO2) + 0.32 (%O2) + 0.28 (%N2) + %CO)

			RUN #1	RUN #2	RUN #3
Md	= Dry molecular weight, lb / lb-mole.	=	29.115075	29.136075	29.09294
0.44	= Molecular weight of CO2 divided by 100.	=	0.44	0.44	0.44
0.32	= Molecular weight of O2 divided by 100.	=	0.32	0.32	0.32
0.28	= Molecular weight of N2 or CO divided by 100.	=	0.28	0.28	0.28

Co2, O2, N2, and CO are in percent by volume, dry basis.

		RUN #1	RUN #2	RUN #3		
5.	**Ms**	28.59	28.63	28.62	=	Md * (1-Bws) + M H20 * (Bws)

			RUN #1	RUN #2	RUN #3
Ms	= Molecular weight of gas , wet basis, lb /lb-mole.	=	28.59	28.63	28.62
M H20	= Molecular weight of water, 18 lb / lb-mole.	=	18	18	18

		RUN #1	RUN #2	RUN #3		
6.	**Vs**	30.92	29.78	29.82	=	$85.49 * Cp * \sqrt{\wedge p} * \sqrt{\frac{Ts + 460}{Ps * Ms}}$

			RUN #1	RUN #2	RUN #3
Vs	= Average stack gas velocity, ft / sec.	=	30.92	29.78	29.82
85.49	= Pitot tube constant, ft / sec.	=	85.49	85.49	85.49
Cp	= Pitot tube coefficient, dimensionless.	=	0.84	0.84	0.84
^P	= Velocity head of stack gas, avg. sq rt.	=	0.375	0.360	0.358
Ts	= Temperature of stack gas, + 460 (Rankine).	=	1129.8	1136.1	1157.3
Ps	= Absolute stack gas pressure, barometric + static.	=	29.98	29.98	29.98
Ms	= Molecular weight of stack gas, wet basis.	=	28.59	28.63	28.62

		RUN #1	RUN #2	RUN #3		
7.	**ACFM**	3279	3157	3162	=	Stack Area * 60 * Vs

			RUN #1	RUN #2	RUN #3
Vs	= Average stack gas velocity, ft / sec.	=	30.92	29.78	29.82

		RUN #1	RUN #2	RUN #3		
8.	**Isokinicity**	95.2	96.2	95.9	=	$\frac{K4 * Ts * Vmstd}{Ps * Vs * An * Min * (1-Bws)}$

			RUN #1	RUN #2	RUN #3
K4	= 0.09450 for English units.	=	0.0945	0.0945	0.0945
Ts	= Stack temperature + 460 R.	=	1129.8	1136.1	1157.3
Vmstd	= Volume of gas collected, scf.	=	90.84	88.16	86.63
Ps	= Stack pressure, inches Hg.	=	29.98	29.98	29.98
Vs	= Stack velocity, ft / sec.	=	30.92	29.78	29.82
An	= Area of the sampling nozzle, cuft.	=	0.0009621	0.0009621	0.0009621
Min.	= Minutes of test	=	120	120	120
Bws	= Water vapor in the gas stream, proportion.	=	0.0476262	0.0456526	0.0430491

		RUN #1	RUN #2	RUN #3		
9.	**Lbs/Hr**	0.12	0.10	0.13	=	$2.205 * E-6 * \frac{Mn}{Vm\ std} * scfh$

				RUN #1	RUN #2	RUN #3
2.205 * E-6	=	Conversion from mg to lbs.	=	2.205 * E-6	2.205 * E-6	2.205 * E-6
Mn	=	Weight gain of filter and wash minus blank.	=	57.7	48.75	61.55
scfh	=	Standard stack volumetric flow rate.	=	87723	84176	82996
Vm std	=	Volume of air sampled at stp.	=	90.84	88.16	86.63

		RUN #1	RUN #2	RUN #3		
10.	**Gr/Dscf**	0.00978	0.00852	0.01094	=	$0.0154 * \frac{Mn}{Vmstd}$

				RUN #1	RUN #2	RUN #3
0.0154	=	Conversion to grains from mg.	=	0.0154	0.0154	0.0154
Vm std	=	Volume of air sampled at stp.	=	90.84	88.16	86.63
Mn	=	Weight gain of filter and wash minus blank.	=	57.7	48.75	61.55

		RUN #1	RUN #2	RUN #3		
11	**Gr/Dscf @ 12% CO2**	0.04319	0.0353316	0.050768	=	$Cr = Cm * \frac{r}{m}$

				RUN #1	RUN #2	RUN #3
Cm	=	measured concentration in a dry gas having m	=	0.00978	0.00852	0.01094
r	=	corrected concentration in a dry gas having a specified reference volume % CO2	=	12	12	12
m	=	measured volume % CO2 in a dry gas	=	2.72	2.89	2.59

		RUN #1	RUN #2	RUN #3		
12	**SCFH**	87723	84176	82996	=	$3600 * (1 - Bws) * Vs * A * \frac{Tstd}{Ts} * \frac{Ps}{Pstd}$

				RUN #1	RUN #2	RUN #3
3600	=	Seconds per hour.	=	3600	3600	3600
Bws	=	Water vapor in the gas stream, proportion.	=	0.0476262	0.0456526	0.0430491
A	=	Area of stack in sq ft.	=	1.7671459	1.7671459	1.7671459
Tstd	=	Standard absolute temperature, 528 R.	=	528	528	528
Pstd	=	Standard absolute pressure, 29.92 in. Hg.	=	29.92	29.92	29.92
Ts	=	Temperature of stack gas, + 460 (Rankine).		1129.8	1136.1	1157.3
Ps	=	Absolute stack gas pressure, barometric + static.		29.97	29.97	29.97
Vs	=	Average stack gas velocity, ft / sec.		30.92	29.78	29.82

CALCULATIONS

CO 1st Hour

		RUN #1	RUN #2	RUN #3		
1.	**Lbs/Hr**	0.013	0.013	0.005	=	.726 * SCFH * PPM * 10^- 7

				RUN #1	RUN #2	RUN #3
scfh	=	Standard stack volumetric flow rate.	=	87723	84176	82996
PPM	=	PPM corrected	=	2.05	2.07	0.86

		RUN #1	RUN #2	RUN #3		
2	**PPM Corr.**	2.05	2.07	0.86	=	Cgas = (C - Co) Cma / (Cm - Co)

				RUN #1	RUN #2	RUN #3
Co	=	Average of initial and final system calibration bias check responses for the zero gas, ppm.	=	-0.31	-0.795	-0.305
C	=	Effluent gas concentration, dry basis, ppm.	=	1.81	1.35	0.55
Cm	=	Average of initial and final system calibration bias check responses for the upscale gas, ppm.	=	26.485	26	25.455
Cma	=	Actual concentration of the upscale calibration gas, ppm.	=	25.88	25.88	25.88

		RUN #1	RUN #2	RUN #3		
3	**PPM @ 7%**	7.31	7.08	3.04	=	PPM * 13.9 / (20.9 - 02)

				RUN #1	RUN #2	RUN #3
02	=	Oxgen	=	17.005464	16.833333	16.978317
PPM	=	PPM	=	2.0476059	2.0717522	0.8589829

CALCULATIONS

CO 2nd Hour

	RUN #1	RUN #2	RUN #3		
Lbs/Hr	0.00265	0.00292	0.00281	=	.726 * SCFH * PPM * 10^- 7

				RUN #1	RUN #2	RUN #3
scfh	=	Standard stack volumetric flow rate.	=	87723	84176	82996
PPM	=	PPM	=	0.42	0.48	0.47

	RUN #1	RUN #2	RUN #3		
PPM Corr.	0.415	0.478	0.467	=	$Cgas = (C - Co) \frac{Cma}{Cm - Co}$

				RUN #1	RUN #2	RUN #3
Co	=	Average of initial and final system calibra bias check responses for the zero gas, p	=	-0.31	-0.795	-0.305
C	=	Effluent gas concentration, dry basis, ppr	=	0.12	-0.3	0.16
Cm	=	Average of initial and final system calibration bias check responses for the upscale gas	=	26.485	26	25.455
Cma	=	Actual concentration of the upscale calibration gas, ppm.	=	25.88	25.88	25.88

	RUN #1	RUN #2	RUN #3		
PPM @ 7% 02	0.43	-1.03	0.57	=	PPM * 13.9 / (20.9 - 02)

				RUN #1	RUN #2	RUN #3
02	=	Oxgen	=	17.09	16.94	17.37
PPM	=	PPM	=	0.42	0.48	0.47

Appendix #1

Test Data

TEST DATA

COMPANY NAME	Swan Point Cemetery - FTC Model FT II SE Human Cremator
ADDRESS	585 Blackstone Boulevard
CITY	Providence
STATE	RI
ZIP	2906
TEST METHODS	Methods 1-5, 3A & 10
CREW MEMBERS	Jim G, Jonathan A, Brian L
LOCATION	Outlet
SOURCE	FTC Model FT II SE Human Crematory Outlet
CONTROL	FTC Model FT II SE Human Crematory

	RUN #1	RUN #2	RUN #3	RUN #4
DATE	2/5/2015	2/5/2015	2/5/2015	2/5/2015
TIME	10:15-12:27	13:11-15:22	16:11-18:20	19:34-21:43
RUN LENGTH (min)	120.00	120.00	120.00	120.00
VOLUME (cubic feet)	86.442	82.81	75.919	92.446
BAROMETRIC (in. Hg)	29.71	29.71	29.71	29.71
METER TEMP. (R)	524.1	524.6	528.7	524.0
STACK TEMP. (R)	1199.8	1234.8	1230.4	1253.1
AVERAGE ?P (in. WC)$^{1/2}$	0.36	0.36	0.32	0.40
AVERAGE ?H (in. WC)	1.71	1.56	1.30	1.99
IMPINGER VOLUME (ml)	111.00	106.20	88.20	105.60
PITOT COEF.	0.84	0.84	0.84	0.84
Static Pressure (in. WC)	0.08	0.08	0.08	0.08
STACK AREA (sq/ft)	1.77	1.77	1.77	1.77
NOZZLE SIZE (sq/ft)	0.0009621	0.000962	0.000962	0.000962
CARBON DIOXIDE (%)	3.09	2.96	2.97	2.95
OXYGEN 1 (%)	16.19	16.26	16.20	16.16
OXYGEN 2 (%)	16.27	16.46	16.64	16.88
NITROGEN 1 (%)	80.72	80.78	80.83	80.89
NITROGEN 2 (%)	80.64	80.58	80.39	80.18

WEIGHTS				
INITIAL PROBE #1 (mg)	101682.5	114963.9	107380.3	109616.1
POST PROBE #1 (mg)	101691.1	114965.4	107384.8	109623.1
TOTAL (mg)	8.6	1.5	4.5	7
INITIAL PROBE #2 (mg)	101682	114963.7	107379.9	109615.7
POST PROBE #2 (mg)	101691	114965.8	107385.3	109623.6
TOTAL (mg)	9	2.1	5.4	7.9
AVG Probe Weight (mg)	8.8	1.8	4.95	7.45
INITIAL FILTER #1 (mg)	21651.2	27244.9	22225	26255.6
POST FILTER #1 (mg)	21683.9	27331.1	22289	
TOTAL (mg)	32.7	86.2	64	83.4
INITIAL FILTER #2 (mg)	21651.4	27245	22225.0	26255.8
POST FILTER #2 (mg)	21683.4	27330.7	22288.7	
TOTAL (mg)	32	85.7	63.7	82.7
AVG Filter Weight (mg)	32.35	85.95	63.85	83.05
INITIAL ACE. BLANK	107412.8	107412.8	107412.8	107412.8
POST ACE. BLANK	107412.9	107412.9	107412.9	107412.9
TOTAL	0.1	0.1	0.1	0.1

TEST RESULTS

OUTLET

	RUN #1	RUN #2	RUN #3	RUN #4
VM (std) ft^3	86.04	82.32	74.84	92.10
VW (std) ft^3	5.23	5.00	4.16	4.98
BWS Fraction (measured)	0.057	0.057	0.053	0.05
MD (lb/lb-mole (dry))	29.14	29.12	29.12	29.12
MS (lb/lb-mole (wet))	28.50	28.49	28.54	28.55
VS (ft/sec)	31.13	30.80	27.93	34.65
SCFH	81602	78436	71750	87514
ACFM	3301	3265	2962	3674
DCFM	1360	1307	1196	1459
ISOKINETIC %	96.9	96.4	95.8	96.7
PARTICULATE				
LBS/HR	0.085647	0.183722	0.144903	0.188978
GR/DSCF	0.007347	0.016396	0.014137	0.015116
LBS/DSCF	1.05E-06	2.34E-06	2.02E-06	2.16E-06
GR/DSCF @ 12% CO2	0.0285606	0.0664455	0.0571582	0.0615715

Vm (std) = Volume of gas sampled at standard conditions.

Vw (std) = Volume of water vapor collected at standard conditions.

Bws = Stack moisture content.

Md = Determination of dry molecular weight of stack gas.

Ms = Determination of stack gas molecular weight.
Vs = Average gas stack velocity. (ft/sec.)

ACFM = Actual cubic feet per minute of gas velocity.

DCFM = Dry standard cubic feet per minute of gas velocity.

Lbs/Hr = Pounds per Hour.

Gr/Dscf = Grains per dry standard cubic feet.

TEST RESULTS

	RUN #1	RUN #2	RUN #3	RUN #4
CEM MONITORING				
CO 1 (lbs/hr)	0.011	0.007	0.007	0.009
CO 2 (lbs/hr)	0.008	0.000	0.000	0.000
O2 1 %	16.19	16.26	16.20	16.16
O2 2 %	16.27	16.46	16.64	16.88
CO2 %	3.44	3.33	3.36	3.35

TEST DATA

	RUN #1	RUN #2	RUN #3	RUN #4
CEM MONITORING				
CO 1 (ppm)	1.99	0.90	0.92	1.03
CO 2 (ppm)	1.52	0.18	0.12	0.13
O2 1 (%)	16.16	16.16	16.13	16.18
O2 2 (%)	16.24	16.42	16.55	16.86
CO2 (%)	3.44	3.33	3.36	3.35
CO 1 CAL. CORR.				
INITIAL ZERO	0.12	0.12	0.12	0.12
INITIAL UPSCALE	26.08	26.61	26.49	27.10
FINAL ZERO	0.12	0.12	0.12	0.12
FINAL UPSCALE	26.61	26.49	27.10	27.06
ACTUAL UPSCALE	25.88	25.88	25.88	25.88
CO 1 (ppm corrected)	1.85	0.76	0.78	0.87
CO 2 CAL CORR.				
INITIAL ZERO	0.12	0.12	0.12	0.12
INITIAL UPSCALE	26.08	26.61	26.49	27.10
FINAL ZERO	0.12	0.12	0.12	0.12
FINAL UPSCALE	26.61	26.49	27.10	27.06
ACTUAL UPSCALE	25.88	25.88	25.88	25.88
CO 2 (ppm corrected)	1.38	0.06	0.00	0.01
O2 1 CAL. CORR.				
INITIAL ZERO	0.05	0.10	0.13	0.02
INITIAL UPSCALE	10.12	10.10	10.06	10.11
FINAL ZERO	0.10	0.13	0.02	0
FINAL UPSCALE	10.10	10.06	10.11	10.12
ACTUAL UPSCALE	10.10	10.10	10.10	10.1
O2 (ppm corrected)	16.19	16.26	16.20	16.16
O2 2 CAL CORR.				
INITIAL ZERO	0.05	0.10	0.13	0.02
INITIAL UPSCALE	10.12	10.10	10.06	10.11
FINAL ZERO	0.10	0.13	0.02	0
FINAL UPSCALE	10.10	10.06	10.11	10.12
ACTUAL UPSCALE	10.10	10.10	10.10	10.1
O2 (ppm corrected)	16.27	16.46	16.64	16.88
CO2 CAL CORR.				
INITIAL ZERO	0.47	0.47	0.51	0.46
INITIAL UPSCALE	10.02	9.97	10.00	10.15
FINAL ZERO	0.47	0.51	0.46	0.47
FINAL UPSCALE	9.97	10.00	10.15	10.17
ACTUAL UPSCALE	9.90	9.90	9.90	9.90
CO2 (ppm corrected)	3.09	2.96	2.97	2.95

TEST DATA

	RUN #1	RUN #2	RUN #3	RUN #4
METHOD 29				
Chromium (mg)	**0.0534**	**0.0229**	**0.0261**	**0.0258**

TEST RESULTS

	OUTLET RUN #1	RUN #2	RUN #3	RUN #4
METHOD 29				
Chromium (mg/dscm)	0.021914	0.009822	0.012315	0.0098917
Chromium (mg/dscm @ 7% 02)	0.064662	0.02944	0.036415	0.0290194

mg/dscm $$Cs = \frac{Mt / K4}{Vmstd}$$

Cs = Concentration of a metal in the stack gas, mg/dscm.

K4 = 10-3 mg/ug.

Mt = Total mass of that metal collected in the sampling train, ug.

Vmstd = Volume of gas sample as measured by the dry gas meter, corrected to dry standard conditions, dscm.

TEST RESULTS

Lbs/Hr $= 2.205 * 10^{-6} * \frac{Mt}{Vmstd} * scfh$

				RUN #1	RUN #2	RUN #3	RUN #4
2.205 * 10^	=	Conversion from mg to lbs.	=	2.205 * 10^-6	2.205 * 10^-6	2.205 * 10^-6	2.205 * 10^-6
scfh	=	Standard stack volumetric flow rate.	=	81601.673	78436.057	71750.157	87513.88
Vm std	=	Volume of air sampled at stp.	=	86.04	82.32	74.84	92.10
Mt	=	Total mass of that metal collected in the sampling train, mg	=				
Chromium	=		=	0.000111668	4.81094E-05	5.51755E-05	5.406E-05

Swan Point Cemetery - FTC Model FT II SE Human Crematory Outlet						Methods 1-5, 3A & 10		Test Date	2/5/2015		
Meter Box Id:	2	Probe ID	4p-1		Cold Box ID:	1		EPA Observer:			
As ft^2	Pbar	Pq (static)	Ps		Avg. Ts F	CO2 - F_{CO2}	O2	N2+C	Md	Ms	Pitot Ck
1.77	29.71	0.08	29.72		740	3.09	16.24	80.67	29.14	28.36	ok
Y	ΔH :	Cp	Vm cf	Vlc	Avg. Tm F	Vm std	Vw std	Bws	S Bws		Leak Ck
0.9912	1.714	0.84	86.442	111.00	64.08	86.044	5.225	0.057	217.666		0 @ 7"
								Assumed Bws:	7.000		
Avg. Sqrt Dlp	Vs	scfm wet	acfm		Qsd dscfh	# Sample Points	Dn	Total Test time	Time @ point	Avg. Dlh	Test Time
0.364	31.21	1,446	3,309		8.18E+04	12	0.42	120	10.00	1.709407	10:15-12:27

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Point No.	Meter (cf)	dl "p"	Target dl "h"	Actual dl "h"	Ts F	tm F (in)	tm F (out)	Cond Temp F	Filter Temp F	Probe Temp F	Vacuum	Imp. Liquid Collected		
A-1	2.75	0.22	2.84	2.84	688	64	64	36	225	255	6	Wt. (end)	Wt. (start)	lc
2	12.466	0.24	2.93	2.93	757	64	64	37	252	253	6	764.1	715.1	49.0
3	22.241	0.16	1.95	1.95	756	63	63	41	259	252	4	620.0	583.7	36.3
4	30.216	0.20	2.45	2.45	749	63	63	45	262	253	5	644.8	636.7	8.1
5	39.034	0.13	1.59	1.59	752	64	63	47	266	252	3	0.0	0.0	0.0
6	46.033	0.10	1.24	1.24	737	65	63	47	244	254	3	0.0	0.0	0.0
B-1	52.314	0.08	1.00	1.00	732	66	63	37	224	256	3	0.0	0.0	0.0
2	57.935	0.05	0.63	0.63	714	65	64	39	231	255	2	885.6	868.0	17.6
3	62.125	0.15	1.84	1.84	750	64	63	39	237	255	4			
4	69.591	0.11	1.35	1.35	747	64	63	41	245	258	4	Isokinetics	96.6	
5	76.282	0.12	1.47	1.47	752	64	63	44	254	256	4	Test Date	2/5/2015	
6	83.051	0.10	1.23	1.23	744	63	62	42	253	254	4			
0	89.196													

Swan Point Cemetery - FTC Model FT II SE Human Crematory Outlet							Methods 1-5, 3A & 10		Test Date	2/5/2015	
Meter Box Id:	2	Probe ID	4p-1		Cold Box ID:	2		EPA Observer:			
As ft^2	Pbar	Pq (static)	Ps		Avg. Ts F	CO2 - F_{CO2}	O2	N2+C	Md	Ms	Pitot Ck
1.77	29.71	0.08	29.72		775	2.96	16.29	80.75	29.13	28.35	ok
Y	ΔH :	Cp	Vm cf	Vlc	Avg. Tm F	Vm std	Vw std	Bws	S Bws		Leak Ck
0.9912	1.714	0.84	82.814	106.20	64.58	82.325	4.999	0.057	260.740		.009 @ 12"
								Assumed Bws:	7.000		
Avg. Sqrt Dlp	Vs	scfm wet	acfm		Qsd dscfh	# Sample Points	Dn	Total Test time	Time @ point	Avg. Dlh	Test Time
0.355	30.87	1,390	3,273		7.86E+04	12	0.42	120	10.00	1.564045	13:11-15:22

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Point No.	Meter (cf)	dl "p"	Target ΔH	Actual dl ΔH	Ts F	tm F (in)	tm F (out)	Cond Temp F	Filter Temp F	Probe Temp F	Vacuum	Imp. Liquid Collected		
A-1	89.897	0.21	2.55	2.55	763	65	63	36	228	261	11	Wt. (end)	Wt. (start)	lc
2	98.687	0.17	2.06	2.06	762	64	63	33	248	253	10	640.9	595.0	45.9
3	106.733	0.18	2.17	2.17	768	63	63	37	261	255	10	637.3	600.5	36.8
4	114.939	0.16	1.91	1.91	781	63	63	40	265	253	9	561.1	551.9	9.2
5	122.708	0.11	1.32	1.32	778	63	63	42	267	253	7	0.0	0.0	0.0
6	129.214	0.10	1.20	1.20	776	64	64	43	268	256	7	0.0	0.0	0.0
B-1	135.377	0.09	1.09	1.09	771	67	64	30	226	258	6	0.0	0.0	0.0
2	141.234	0.06	0.72	0.72	774	66	64	36	256	255	4	937.5	923.2	14.3
3	146.076	0.12	1.44	1.44	778	66	64	36	247	257	6			
4	152.806	0.17	2.04	2.04	778	65	64	37	253	257	11	Isokinetics	96.2	
5	160.584	0.11	1.30	1.30	792	64	64	40	264	258	8	Test Date	2/5/2015	
6	167.171	0.08	0.96	0.96	776	65	65	39	259	255	7			
0	172.711													

Swan Point Cemetery - FTC Model FT II SE Human Crematory Outlet							Methods 1-5, 3A & 10		Test Date	2/5/2015	
Meter Box Id:	2	Probe ID	4p-1		Cold Box ID:	3		EPA Observer:			
As ft^2	Pbar	Pq (static)	Ps		Avg. Ts F	CO2 - F_{CO2}	O2	N2+C	Md	Ms	Pitot Ck
1.77	29.71	0.08	29.72		770	2.97	16.34	80.69	29.13	28.35	ok
Y	ΔH :	Cp	Vm cf	Vlc	Avg. Tm F	Vm std	Vw std	Bws	S Bws		Leak Ck
0.9912	1.714	0.84	75.919	88.20	68.67	74.839	4.152	0.053	255.116		0 @ 6"
								Assumed Bws:	7.000		
Avg. Sqrt Dlp	Vs	scfm wet	acfm		Qsd dscfh	# Sample Points	Dn	Total Test time	Time @ point	Avg. Dlh	Test Time
0.323	28.03	1,266	2,971		7.20E+04	12	0.42	120	10.00	1.299295	16:11-18:20

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Point No.	Meter (cf)	dl "p"	Target dl "h"	Actual dl "h"	Ts F	tm F (in)	tm F (out)	Cond Temp F	Filter Temp F	Probe Temp F	Vacuum	Imp. Liquid Collected		
A-1	173.08	0.08	1.00	1.00	735	70	67	30	223	256	2	Wt. (end)	Wt. (start)	lc
2	178.694	0.07	0.84	0.84	787	69	68	32	239	255	2	691.2	644.3	46.9
3	184.002	0.10	1.20	1.20	790	69	68	30	261	252	3	736.3	711.1	25.2
4	190.232	0.16	1.90	1.90	798	69	68	31	269	255	4	562.8	557.7	5.1
5	197.965	0.09	1.08	1.08	787	69	69	33	265	254	3	0.0	0.0	0.0
6	203.846	0.07	0.84	0.84	787	69	68	33	257	256	2	0.0	0.0	0.0
B-1	209.068	0.08	0.96	0.96	784	70	68	27	226	254	3	0.0	0.0	0.0
2	214.532	0.12	1.49	1.49	748	69	68	28	240	257	4	847.8	836.8	11.0
3	221.548	0.16	1.99	1.99	742	68	67	30	249	255	5			
4	229.186	0.13	1.61	1.61	747	68	67	32	255	258	5	Isokinetics	95.5	
5	236.242	0.14	1.72	1.72	752	67	66	31	260	256	5	Test Date	2/5/2015	
6	243.441	0.08	0.96	0.96	788	67	66	33	262	253	3			
0	248.994													

Swan Point Cemetery - FTC Model FT II SE Human Crematory Outlet									Test Date	2/5/2015	
Meter Box Id:	2	Probe ID	4p-1		Cold Box ID:	4		EPA Observer:			
As ft^2	Pbar	Pq (static)	Ps		Avg. Ts F	CO2 - F_{CO2}	O2	N2+C	Md	Ms	Pitot Ck
1.77	29.71	0.08	29.72		793	2.95	16.52	80.53	29.13	28.35	ok
Y	ΔH :	Cp	Vm cf	Vlc	Avg. Tm F	Vm std	Vw std	Bws	S Bws		Leak Ck
0.9912	1.714	0.84	92.446	105.60	64.00	92.100	4.971	0.051	285.422	0.999	0 @ 8"
								Assumed Bws:	7.000		
Avg. Sqrt Dlp	Vs	scfm wet	acfm		Qsd dscfh	# Sample Points	Dn	Total Test time	Time @ point	Avg. Dlh	Test Time
0.397	34.77	1,543	3,686		8.78E+04	12	0.42	120	10.00	1.994167	19:34-21:43
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Point No.	Meter (cf)	dl "p"	Target dl "h"	Actual dl "h"	Ts F	tm F (in)	XAD	Cond Temp F	Filter Temp F	Probe Temp F	Vacuum	Imp. Liquid Collected		
												Wt. (end)	Wt. (start)	lc
1	249.831	0.24	3.01	3.00	726	66	64	21	224	252	5	796.9	752.0	44.9
2	259.434	0.27	3.20	3	793	65	63	23	236	255	5	753.1	714.2	38.9
3	269.206	0.30	3.43	3.40	834	64	62	27	250	257	7	538.5	529.0	9.5
4	279.526	0.25	2.87	2.90	832	64	62	30	259	257	6	0.0	0.0	0.0
5	289.095	0.21	2.42	2.40	825	64	61	34	263	254	6	920.5	908.2	12.3
6	297.974	0.18	2.09	2.10	816	64	62	35	265	255	5			
B-1	306.117	0.16	1.86	2.10	815	65	64	26	226	253	5			
2	313.938	0.11	1.29	1.30	804	64	62	30	264	256	4	Isokinetics	96.4	
3	320.352	0.08	0.96	0.96	780	64	62	29	253	254	3	Test Date	2/5/2015	
4	325.949	0.06	0.73	0.73	755	63	62	27	246	254	3		4/5/1900	
5	330.933	0.09	1.08	1.20	770	63	62	26	241	253	3			
6	336.976	0.07	0.84	0.84	767	62	62	26	235	253	3			
0	342.277													

TEST DATA

COMPANY NAME	Swan Point Cemetery - FTC Model FT III SE H
ADDRESS	585 Blackstone Boulevard
CITY	Providence
STATE	RI
ZIP	2906
TEST METHODS	Methods 1-5, 3A & 10
CREW MEMBERS	Jim G, Jonathan A, Brian L
LOCATION	Outlet
SOURCE	FTC Model FT III SE Human Crematory Outlet
CONTROL	FTC Model FT III SE Human Crematory

	RUN #1	RUN #2	RUN #3
DATE	2/6/2015	2/6/2015	2/6/2015
TIME	11:13-13:24	14:44-16:55	17:45-19:59
RUN LENGTH (min)	120.00	120.00	120.00
VOLUME (cubic feet)	91.766	89.39	87.264
BAROMETRIC (in. Hg)	29.97	29.97	29.97
METER TEMP. (R)	531.9	533.6	530.1
STACK TEMP. (R)	1129.8	1136.1	1157.3
AVERAGE ?P (in. WC)$^{1/2}$	0.38	0.36	0.36
AVERAGE ?H (in. WC)	1.96	1.75	1.72
IMPINGER VOLUME (ml)	96.40	89.50	82.70
PITOT COEF.	0.84	0.84	0.84
Static Pressure (in. WC)	0.09	0.09	0.09
STACK AREA (sq/ft)	1.77	1.77	1.77
NOZZLE SIZE (sq/ft)	0.0009621	0.000962	0.000962
CARBON DIOXIDE (%)	2.72	2.89	2.59
OXYGEN 1 (%)	17.01	16.83	16.98
OXYGEN 2 (%)	17.09	16.94	17.37
NITROGEN 1 (%)	80.28	80.27	80.44
NITROGEN 2 (%)	80.19	80.16	80.04

WEIGHTS			
INITIAL PROBE #1 (mg)	119431.4	94746.7	116845.7
POST PROBE #1 (mg)	119438.4	94759.2	116850.2
TOTAL (mg)	7	12.5	4.5
INITIAL PROBE #2 (mg)	119431.5	94746.9	116845.4
POST PROBE #2 (mg)	119438.2	94759.1	116850.5
TOTAL (mg)	6.7	12.2	5.1
AVG Probe Weight (mg)	6.85	12.35	4.8
INITIAL FILTER #1 (mg)	27462.4	27489.7	20627.7
POST FILTER #1 (mg)	27513.3	27526.5	20684.5
TOTAL (mg)	50.9	36.8	56.8
INITIAL FILTER #2 (mg)	27462	27489.9	20627.3
POST FILTER #2 (mg)	27513	27526.1	20684.2
TOTAL (mg)	51	36.2	56.9
AVG Filter Weight (mg)	50.95	36.5	56.85
INITIAL ACE. BLANK	107412.8	107412.8	107412.8
POST ACE. BLANK	107412.9	107412.9	107412.9
TOTAL	0.1	0.1	0.1

TEST RESULTS

OUTLET

	RUN #1	RUN #2	RUN #3
VM (std) ft^3	90.84	88.16	86.63
VW (std) ft^3	4.54	4.22	3.90
BWS Fraction (measured)	0.048	0.046	0.043
MD (lb/lb-mole (dry))	29.12	29.14	29.09
MS (lb/lb-mole (wet))	28.59	28.63	28.62
VS (ft/sec)	30.92	29.78	29.82

SCFH	87723	84176	82996
ACFM	3279	3157	3162
DCFM	1462	1403	1383
ISOKINETIC %	95.2	96.2	95.9

PARTICULATE			
LBS/HR	0.122586	0.102398	0.129732
GR/DSCF	0.009782	0.008515	0.010942
LBS/DSCF	1.40E-06	1.22E-06	1.56E-06
GR/DSCF @ 12% CO2	0.0431900	0.0353316	0.0507680

Vm (std) = Volume of gas sampled at standard conditions.

Vw (std) = Volume of water vapor collected at standard conditions.

Bws = Stack moisture content.

Md = Determination of dry molecular weight of stack gas.

Ms = Determination of stack gas molecular weight.
Vs = Average gas stack velocity. (ft/sec.)

ACFM = Actual cubic feet per minute of gas velocity.

DCFM = Dry standard cubic feet per minute of gas velocity.

Lbs/Hr = Pounds per Hour.

Gr/Dscf = Grains per dry standard cubic feet.

TEST RESULTS

	RUN #1	RUN #2	RUN #3
CEM MONITORING			
CO 1 (lbs/hr)	0.013	0.013	0.005
CO 2 (lbs/hr)	0.003	0.003	0.003
O2 1 %	17.01	16.83	16.98
O2 2 %	17.09	16.94	17.37
CO2 %	3.03	3.20	2.91

TEST DATA

	RUN #1	RUN #2	RUN #3
CEM MONITORING			
CO 1 (ppm)	1.81	1.35	0.55
CO 2 (ppm)	0.12	-0.30	0.16
O2 1 (%)	16.95	16.78	16.92
O2 2 (%)	17.02	16.84	17.29
CO2 (%)	3.03	3.20	2.91

CO 1 CAL. CORR.			
INITIAL ZERO	0.24	-0.86	-0.73
INITIAL UPSCALE	26.12	26.85	25.15
FINAL ZERO	-0.86	-0.73	0.12
FINAL UPSCALE	26.85	25.15	25.76
ACTUAL UPSCALE	25.88	25.88	25.88
CO 1 (ppm corrected)	2.05	2.07	0.86

CO 2 CAL CORR.			
INITIAL ZERO	0.24	-0.86	-0.73
INITIAL UPSCALE	26.12	26.85	25.15
FINAL ZERO	-0.86	-0.73	0.12
FINAL UPSCALE	26.85	25.15	25.76
ACTUAL UPSCALE	25.88	25.88	25.88
CO 2 (ppm corrected)	0.42	0.48	0.47

O2 1 CAL. CORR.			
INITIAL ZERO	0.18	0.13	0.13
INITIAL UPSCALE	10.15	10.11	10.13
FINAL ZERO	0.13	0.13	0.14
FINAL UPSCALE	10.11	10.13	10.11
ACTUAL UPSCALE	10.10	10.10	10.10
O2 (ppm corrected)	17.01	16.83	16.98

O2 2 CAL CORR.			
INITIAL ZERO	0.18	0.13	0.13
INITIAL UPSCALE	10.15	10.11	10.13
FINAL ZERO	0.13	0.13	0.14
FINAL UPSCALE	10.11	10.13	10.11
ACTUAL UPSCALE	10.10	10.10	10.10
O2 (ppm corrected)	17.09	16.94	17.37
CO2 CAL CORR.			
INITIAL ZERO	0.47	0.47	0.47
INITIAL UPSCALE	9.80	9.79	9.84
FINAL ZERO	0.47	0.47	0.47
FINAL UPSCALE	9.79	9.84	9.78
ACTUAL UPSCALE	9.90	9.90	9.90
CO2 (ppm corrected)	2.72	2.89	2.59

Swan Point Cemetery - FTC Model FT III SE Human Crematory Outlet						Methods 1-5, 3A & 10		Test Date	2/6/2015		
Meter Box Id:	2	Probe ID	4p-1		Cold Box ID:	8		EPA Observer:			
As ft^2	Pbar	Pq (static)	Ps		Avg. Ts F	CO2 - F_{CO2}	O2	N2+C	Md	Ms	Pitot Ck
1.77	29.97	0.09	29.98		670	2.72	16.98	80.30	29.11	28.34	ok
Y	ΔH :	Cp	Vm cf	Vlc	Avg. Tm F	Vm std	Vw std	Bws	S Bws		Leak Ck
0.9912	1.714	0.84	91.766	96.40	71.92	90.838	4.538	0.048	144.753		0 @ 6"
								Assumed Bws:	7.000		
Avg. Sqrt Dlp	Vs	scfm wet	acfm		Qsd dscfh	# Sample Points	Dn	Total Test time	Time @ point	Avg. Dlh	Test Time
0.375	31.06	1,542	3,293		8.81E+04	12	0.42	120	10.00	1.960048	11:13-13:24

Protect

Unprotect

An
0.00096211

TRUE

Point No.	Meter (cf)	dl "p"	Target dl "h"	Actual dl "h"	Ts F	tm F (in)	tm F (out)	Cond Temp F	Filter Temp F	Probe Temp F	Vacuum	Imp. Liquid Collected		
A-1	451.15	0.27	3.60	3.60	669	72	70	28	225	256	5	Wt. (end)	Wt. (start)	lc
2	461.168	0.30	3.88	3.88	702	72	70	32	237	258	5	800.9	764.6	36.3
3	472.088	0.13	1.72	1.72	675	72	70	42	265	255	3	604.5	572.2	32.3
4	479.378	0.12	1.60	1.60	664	71	70	47	245	255	3	551.3	541.2	10.1
5	486.665	0.11	1.47	1.47	665	71	70	47	232	257	3	0.0	0.0	0.0
6	493.586	0.07	0.94	0.94	663	70	70	46	225	254	2	0.0	0.0	0.0
B-1	499.168	0.18	2.47	2.47	639	74	71	34	224	256	4	0.0	0.0	0.0
2	507.971	0.12	1.60	1.60	669	72	71	36	236	257	3	876.9	859.2	17.7
3	514.972	0.13	1.72	1.72	678	72	72	36	244	255	3			
4	522.241	0.15	1.95	1.95	696	72	72	39	239	254	4	Isokinetics	94.7	
5	530.187	0.12	1.62	1.62	658	72	72	41	234	253	4	Test Date	2/6/2015	
6	537.246	0.07	0.94	0.94	659	73	73	39	230	256	3			
0	542.917													

Swan Point Cemetery - FTC Model FT III SE Human Crematory Outlet						Methods 1-5, 3A & 10		Test Date	2/6/2015		
Meter Box Id:	2	Probe ID	4p-1		Cold Box ID:	5		EPA Observer:			
As ft^2	Pbar	Pq (static)	Ps		Avg. Ts F	CO2 - F_{CO2}	O2	N2+C	Md	Ms	Pitot Ck
1.77	29.97	0.09	29.98		676	2.89	16.81	80.30	29.14	28.36	ok
Y	ΔH :	Cp	Vm cf	Vlc	Avg. Tm F	Vm std	Vw std	Bws	S Bws		Leak Ck
0.9912	1.714	0.84	89.391	89.50	73.58	88.165	4.213	0.046	150.402		.008 @ 10"
								Assumed Bws:	7.000		
Avg. Sqrt Dlp	Vs	scfm wet	acfm		Qsd dscfh	# Sample Points	Dn	Total Test time	Time @ point	Avg. Dlh	Test Time
0.360	29.92	1,477	3,172		8.46E+04	12	0.42	120	10.00	1.745886	14:44-16:55

Tab

Protect

Unprotect

An
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TRUE

Point No.	Meter (cf)	dl "p"	Target ΔH	Actual dl ΔH	Ts F	tm F (in)	tm F (out)	Cond Temp F	Filter Temp F	Probe Temp F	Vacuum	Imp. Liquid Collected		
												Wt. (end)	Wt. (start)	lc
A-1	546.062	0.07	0.97	0.97	630	73	71	30	224	257	3			
2	551.743	0.12	1.61	1.61	659	72	70	33	234	258	5	707.2	671.5	35.7
3	558.899	0.17	2.23	2.23	688	73	71	34	242	254	6	687.5	653.7	33.8
4	567.387	0.13	1.70	1.70	694	73	71	38	251	255	5	544.8	537.2	7.6
5	574.842	0.14	1.83	1.83	691	73	72	41	260	256	6	0.0	0.0	0.0
6	582.346	0.12	1.58	1.58	687	73	71	42	254	256	5	0.0	0.0	0.0
B-1	589.566	0.11	1.48	1.48	669	76	74	32	225	253	5	0.0	0.0	0.0
2	596.496	0.13	1.73	1.73	673	74	73	37	229	254	6	994.9	982.5	12.4
3	603.814	0.16	2.19	2.19	644	74	73	39	241	256	7			
4	612.139	0.15	1.96	1.96	696	74	72	40	258	256	7			
5	620.318	0.18	2.36	2.36	689	74	72	42	257	255	9			
6	628.924	0.10	1.31	1.31	693	74	72	44	265	254	6			
0	635.453													

Isokinetics	95.8
Test Date	2/6/2015

Swan Point Cemetery - FTC Model FT III SE Human Crematory Outlet						Methods 1-5, 3A & 10		Test Date	2/6/2015		
Meter Box Id:	2	Probe ID	4p-1		Cold Box ID:	6		EPA Observer:			
As ft^2	Pbar	Pq (static)	Ps		Avg. Ts F	CO2 - F_{CO2}	O2	N2+C	Md	Ms	Pitot Ck
1.77	29.97	0.09	29.98		697	2.59	17.11	80.30	29.10	28.32	ok
Y	ΔH :	Cp	Vm cf	Vlc	Avg. Tm F	Vm std	Vw std	Bws	S Bws		Leak Ck
0.9912	1.714	0.84	87.264	82.70	70.08	86.629	3.893	0.043	170.366		0 @ 6"
								Assumed Bws:	7.000		
Avg. Sqrt Dlp	Vs	scfm wet	acfm		Qsd dscfh	# Sample Points	Dn	Total Test time	Time @ point	Avg. Dlh	Test Time
0.358	29.98	1,453	3,179		8.34E+04	12	0.42	120	10.00	1.715297	17:45-19:59

TRUE

Protect

Unprotect

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0.00096211

Point No.	Meter (cf)	dl "p"	Target dl "h"	Actual dl "h"	Ts F	tm F (in)	tm F (out)	Cond Temp F	Filter Temp F	Probe Temp F	Vacuum	Imp. Liquid Collected Wt. (end)	Wt. (start)	lc
A-1	647.74	0.22	2.90	2.90	683	72	69	35	228	257	5			
2	657.324	0.24	3.08	3.08	714	73	70	35	241	260	5	729.3	698.2	31.1
3	667.102	0.16	2.05	2.05	714	72	69	39	254	259	4	613.0	583.4	29.6
4	675.179	0.13	1.67	1.67	711	71	69	44	261	256	4	545.0	536.6	8.4
5	682.568	0.11	1.41	1.41	707	71	69	47	266	253	4	0.0	0.0	0.0
6	689.468	0.08	1.03	1.03	703	71	68	51	270	257	3	0.0	0.0	0.0
B-1	695.490	0.09	1.17	1.17	696	72	69	31	224	258	3	0.0	0.0	0.0
2	701.569	0.06	0.79	0.79	684	70	68	37	238	256	2	904.1	890.5	13.6
3	706.545	0.15	1.96	1.96	684	68	67	36	246	254	4			
4	714.381	0.12	1.56	1.56	687	67	66	36	252	255	3			
5	721.387	0.11	1.41	1.41	703	67	65	35	257	257	3			
6	727.986	0.12	1.57	1.57	681	67	65	34	260	257	3			
0	735.006													

Isokinetics	95.4
Test Date	2/6/2015

2-5-15

Run 1
10:15 - 11:15
11:27 - 12:27

lc = 0 @ 7"

Run 2
13:10 - 14:11
14:22 - 15:22

lc = .009 @ 12"

Run 3
16:11 - 17:11
17:20 - 18:20

lc = 0 @ 6"

Run 4
19:34 - 20:34
20:43 - 21:43

lc = 0 @ 8"

2-6-15

Run 1

11:13 - 12:13
12:24 - 13:24

Ic = 0 @ 6"

Run 2

14:44 - 15:44
15:55 - 16:55

Ic = .008 @ 10"

Run 3

17:45 - 18:45
18:59 - 19:59

Ic = 0 @ 6"

Appendix #2

Laboratory Data

Lab Data Sheet For: Swan Point Cemetery - FTC Model FT II SE Human Crematory Outlet By: Brian L

Moisture Weights

Method 5 Moisture

			grams	grams	grams	grams	grams	grams	grams
RUN # 1		Box ID	1	2	3	4	5	6	Drierite
	Gross	1	764.1	620.0	644.8				885.6
	Tare		715.1	583.7	636.7				868.0
	Net		49.0	36.3	8.1	0.0	0.0	0.0	17.6
		Reagent	H2O	H2O	H2O	H2O			
		mLs	100.0	100.0	100.0	100.0			

			grams		grams
Intial Imp mL =	300.0	Impinger Total =	93.4	Total =	111

			grams	grams	grams	grams	grams	grams	grams
RUN # 2		Box ID	1	2	3	4	5	6	Drierite
	Gross	2	640.9	637.3	561.1				937.5
	Tare		595.0	600.5	551.9				923.2
	Net		45.9	36.8	9.2	0.0	0.0	0.0	14.3
		Reagent	H2O	H2O	H2O	H2O			
		mLs	100.0	100.0	100.0	100.0			

			grams		grams
Intial Imp mL =	300.0	Impinger Total =	91.9	Total =	106.2

			grams	grams	grams	grams	grams	grams	grams
RUN # 3		Box ID	1	2	3	4	5	6	Drierite
	Gross	3	691.2	736.3	562.8				847.8
	Tare		644.3	711.1	557.7				836.8
	Net		46.9	25.2	5.1	0.0	0.0	0.0	11.0
		Reagent	H2O	H2O	H2O	H2O			
		mLs	100.0	100.0	100.0	100.0			

			grams		grams
Intial Imp mL =	300.0	Impinger Total =	77.2	Total =	88.2

			grams	grams	grams	grams	grams	grams	grams
RUN # 4		Box ID	1	2	3	4	5	6	Drierite
	Gross	4	796.9	753.1	538.5				920.5
	Tare		752.0	714.2	529.0				908.2
	Net		44.9	38.9	9.5	0.0	0.0	0.0	12.3
		Reagent	H2O	H2O	H2O	H2O			
		mLs	100.0	100.0	100.0	100.0			

			grams		grams
Intial Imp mL =	300.0	Impinger Total =	93.3	Total =	105.6

Conditions:	Temp	RH	Date	Pb		Scales
Initial	47	57	2/5/2015	29.71	s/n	1203240794
Post	58	28	2/8/2015	28.29	s/n	7124111434

Lab Data Sheet For: Swan Point Cemetery - FTC Model FT II SE Human Crematory Outlet By: Brian L

Filter Weight Method 5

Run #	ID#	Temp	RH	Barometric	Time	Date	Gross	Temp	RH	Barometric	Time	Date	Tare	Net Gain
1	2202	52	28	28.53	16:58	2/9/2015	21683.9	58	26	28.85	11:11	1/28/2015	21651.2	32.7
1	2202	42	30	28.76	8:58	2/13/2015	21683.4	53	29	28.76	9:31	1/30/2015	21651.4	32
													AVG	32.35
2	2198	52	28	28.53	17:00	2/9/2015	27331.1	51	29	28.53	14:32	1/27/2015	27244.9	86.2
2	2198	42	30	28.76	8:59	2/13/2015	27330.7	58	26	28.85	11:01	1/28/2015	27245	85.7
													AVG	85.95
3	2201	52	28	28.53	17:01	2/9/2015	22289	58	26	28.85	11:10	1/28/2015	22225	64
3	2201	42	30	28.76	9:00	2/13/2015	22288.7	53	29	28.76	9:30	1/30/2015	22225	63.7
													AVG	63.85
4	2204	52	28	28.53	17:03	2/9/2015	26339	58	26	28.85	11:15	1/28/2015	26255.6	83.4
4	2204	42	30	28.76	9:02	2/13/2015	26338.5	53	29	28.76	9:32	1/30/2015	26255.8	82.7
													AVG	83.05

Scale Serial # 39080133 Total Gain 265.2

Lab Data Sheet For: Swan Point Cemetery - FTC Model FT II SE Human Crematory Outlet By: Brian L

Probe Rinse Weight

Run #		Temp	RH	Barometric	Time	Date	Gross	Temp	RH	Barometric	Time	Date	Tare	Net Gain
1		41	30	28.76	8:25	2/16/2015	101691.1	54	28	28.26	8:50	2/2/2015	101682.5	8.6
1		54	26	28.91	12:22	2/20/2015	101691	59	28	28.53	16:30	2/9/2015	101682	9
													AVG	8.8
2		41	30	28.76	8:26	2/16/2015	114965.4	54	28	28.26	8:52	2/2/2015	114963.9	1.5
2		54	26	28.91	12:24	2/20/2015	114965.8	59	28	28.53	16:31	2/9/2015	114963.7	2.1
													AVG	1.8
3		41	30	28.76	8:28	2/16/2015	107384.8	54	28	28.26	8:53	2/2/2015	107380.3	4.5
3		54	26	28.91	12:25	2/20/2015	107385.3	59	28	28.53	16:33	2/9/2015	107379.9	5.4
													AVG	4.95
4		41	30	28.76	8:29	2/16/2015	109623.1	54	28	28.26	8:54	2/2/2015	109616.1	7
4		54	26	28.91	12:26	2/20/2015	109623.6	59	28	28.53	16:35	2/9/2015	109615.7	7.9
													AVG	7.45

Scale Serial # 39080133

Total Gain 23

Lab Data Sheet For: Swan Point Cemetery - FTC Model FT III SE Human Crematory Outlet By: Brian L

Moisture Weights

Method 5 Moisture

			grams	grams	grams	grams	grams	grams	grams
RUN # 1		Box ID	1	2	3	4	5	6	Drierite
	Gross	8	800.9	604.5	551.3				876.9
	Tare		764.6	572.2	541.2				859.2
	Net		36.3	32.3	10.1	0.0	0.0	0.0	17.7
		Reagent	H2O	H2O	H2O	H2O			
		mLs	100.0	100.0	100.0	100.0			

		grams			grams
Intial Imp mL =	300.0	Impinger Total =	78.7	Total =	96.4

			grams	grams	grams	grams	grams	grams	grams
RUN # 2		Box ID	1	2	3	4	5	6	Drierite
	Gross	5	707.2	687.5	544.8				994.9
	Tare		671.5	653.7	537.2				982.5
	Net		35.7	33.8	7.6	0.0	0.0	0.0	12.4
		Reagent	H2O	H2O	H2O	H2O			
		mLs	100.0	100.0	100.0	100.0			

		grams			grams
Intial Imp mL =	300.0	Impinger Total =	77.1	Total =	89.5

			grams	grams	grams	grams	grams	grams	grams
RUN # 3		Box ID	1	2	3	4	5	6	Drierite
	Gross	6	729.3	613.0	545.0				904.1
	Tare		698.2	583.4	536.6				890.5
	Net		31.1	29.6	8.4	0.0	0.0	0.0	13.6
		Reagent	H2O	H2O	H2O	H2O			
		mLs	100.0	100.0	100.0	100.0			

		grams			grams
Intial Imp mL =	300.0	Impinger Total =	69.1	Total =	82.7

Conditions:	Temp	RH	Date	Pb		Scales
Initial	47	57	2/5/2015	29.71	s/n	1203240794
Post	58	28	2/8/2015	28.29	s/n	7124111434

Lab Data Sheet For: Swan Point Cemetery - FTC Model FT III SE Human Crematory Outlet By: Brian L

Filter Weight Method 5

Run #	ID#	Temp	RH	Barometric	Time	Date	Gross	Temp	RH	Barometric	Time	Date	Tare	Net Gain
1	2219	59	28	28.53	17:09	2/9/2015	27513.3	53	27	28.67	8:07	2/2/2015	27462.4	50.9
1	2219	42	30	28.76	9:08	2/13/2015	27513	51	28	28.67	21:51	2/3/2015	27462	51
													AVG	50.95
2	2206	59	28	28.53	17:10	2/9/2015	27526.5	58	26	28.85	11:19	1/28/2015	27489.7	36.8
2	2206	42	30	28.76	9:09	2/13/2015	27526.1	53	29	28.76	9:35	1/30/2015	27489.9	36.2
													AVG	36.5
3	2220	59	28	28.53	17:12	2/9/2015	20684.5	53	27	28.67	8:10	2/2/2015	20627.7	56.8
3	2220	42	30	28.76	9:11	2/13/2015	20684.2	51	28	28.67	21:52	2/3/2015	20627.3	56.9
													AVG	56.85

Scale Serial # 39080133 Total Gain 144.3

Lab Data Sheet For: Swan Point Cemetery - FTC Model FT III SE Human Crematory Outlet By: Brian L

Probe Rinse Weight

Run #		Temp	RH	Barometric	Time	Date	Gross	Temp	RH	Barometric	Time	Date	Tare	Net Gain
1		41	30	28.76	8:33	2/16/2015	119438.4	54	28	28.23	8:56	2/2/2015	119431.4	7
1		54	26	28.91	12:30	2/20/2015	119438.2	59	28	28.53	16:20	2/9/2015	119431.5	6.7
													AVG	6.85
2		41	30	28.76	8:35	2/16/2015	94759.2	54	28	28.23	8:57	2/2/2015	94746.7	12.5
2		54	26	28.91	12:31	2/20/2015	94759.1	59	28	28.53	16:22	2/9/2015	94746.9	12.2
													AVG	12.35
3		41	30	28.76	8:37	2/16/2015	116850.2	54	28	28.23	8:59	2/2/2015	116845.7	4.5
3		54	26	28.91	12:33	2/20/2015	116850.5	59	28	28.53	16:23	2/9/2015	116845.4	5.1
													AVG	4.8

Scale Serial # 39080133 Total Gain 24

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March 16, 2015

Analytical Report for Service Request No: K1501586

James Gray
Custom Stack Analysis, LLC.
14614 Cenfield St. N.E.
P.O. Box 3750
Alliance, OH 44601

RE: Swan Point Cemetery / 2/5/2015

Dear James,

Enclosed are the results of the sample(s) submitted to our laboratory February 17, 2015
For your reference, these analyses have been assigned our service request number **K1501586.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3293. You may also contact me via email at Shar.Samy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Shar Samy, Ph.D.
Project Manager

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEC UST	http://dec.alaska.gov/applications/eh/ehllabreports/USTLabs.aspx	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L14-51
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	Not available	-
Idaho DHW	http://www.healthandwelfare.idaho.gov/Health/Labs/CertificationDrinkingWaterLabs/tabid/1833/Default.aspx	-
ISO 17025	http://www.pjlabs.com/	L14-50
Louisiana DEQ	http://www.deq.louisiana.gov/portal/DIVISIONS/PublicParticipationandPermitSupport/LouisianaLaboratoryAccreditationProgram.aspx	03016
Maine DHS	Not available	WA01276
Michigan DEQ	http://www.michigan.gov/deq/0,1607,7-135-3307_4131_4156---,00.html	9949
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Montana DPHHS	http://www.dphhs.mt.gov/publichealth/	CERT0047
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/oqa/	WA005
North Carolina DWQ	http://www.dwqlab.org/	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/envserv/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wisconsin DNR	http://dnr.wi.gov/	998386840
Wyoming (EPA Region 8)	http://www.epa.gov/region8/water/dwhome/wyomingdi.html	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.

Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Chain of Custody

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Chain of Custody Form

K1501556

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Swan Point Cemetery	A	Method 29 - Cr
Work Order		Project Number	2/5/2015	B	
Company Name	CustomStackAnalysis, LLC.	Bill To Company		C	
Send Report To	Brian Lemasters	Invoice Attn.		D	
Address	14614 Cenfield St. N.E.	Address		E	
				F	
City/State/Zip	Alliance, OH 44601	City/State/Zip		G	
Phone	330-525-5119	Phone		H	
Fax	330-525-7908	Fax		I	
e-Mail Address	brianl@customstackanalysis.com			J	

No.	Sample Description	Date	Time	Matrix	Pres. Key Numbers	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	Run 1 - Cont. #1	2/5/2015	12:27 PM			1	X										
2	Run 1 - Cont. #3	2/5/2015				1	X										
3	Run 1 - Cont. #4	2/5/2015				1	X										
4	Run 2 - Cont. #1	2/5/2015	3:22 PM			1	X										
5	Run 2 - Cont. #3	2/5/2015				1	X										
6	Run 2 - Cont. #4	2/5/2015				1	X										
7	Run 3 - Cont. #1	2/5/2015	6:20 PM			1	X										
8	Run 3 - Cont. #3	2/5/2015				1	X										
9	Run 3 - Cont. #4	2/5/2015				1	X										
10																	

Sampler(s): Please Print & Sign: Brian Lemasters

Shipment Method: Fedex

Required Turnaround Time: (Check Box) ☒ 10 Wk Days ☐ 5 Wk Days ☐ 3 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☑ Other

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Notes:
	2-13-15	2:00				
Relinquished by:	Date:	Time:	Received by (Laboratory):	Date:	Time:	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory): K Smith 2/17/15 0920			

ALS Cooler ID	Cooler Temp	QC Package: (Check Box Below)	
		☐ Level II: Standard QC	☐ Level III: Raw Data
		☐ TRRP LRC	☐ TRRP Level IV
		☐ Level IV: SW846 Methods/CLP like	
		☐ Other:	

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS.

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(Fax) 360.636.1068

Chain of Custody Form

V15015516

ALS Project Manager:		ALS Work Order #:	

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name	Swan Point Cemetery	A	Method 29 - Cr
Work Order		Project Number	2/5/2015	B	
Company Name	CustomStackAnalysis, LLC.	Bill To Company		C	
Send Report To	Brian Lemasters	Invoice Attn.		D	
Address	14614 Cenfield St. N.E.	Address		E	
				F	
City/State/Zip	Alliance, OH 44601	City/State/Zip		G	
Phone	330-525-5119	Phone		H	
Fax	330-525-7908	Fax		I	
e-Mail Address	brianl@customstackanalysis.com			J	

No.	Sample Description	Date	Time	Matrix	Pres. Key Numbers	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	Run 4 - Cont. #1	2/5/2015	9:43 PM			1	X										
2	Run 4 - Cont. #3	2/5/2015				1	X										
3	Run 4 - Cont. #4	2/5/2015				1	X										
4	Cont. 8A - .1NHNO3 Blank					1											
5	Cont. #9 - 5% HNO3 / 10% H2O2					1											
6	Cont. #12 - Filter Blank					1											
7																	
8																	
9																	
10																	

Sampler(s): Please Print & Sign: Brian Lemasters

Shipment Method: Fedex

Required Turnaround Time: (Check Box) ☒ 10 Wk Days ☐ 5 Wk Days ☐ 3 Wk Days ☐ 2 Wk Days ☐ 24 Hour ☑ Other

Results Due Date:

Relinquished by:	Date:	Time:	Received by:	Date:	Time:	Notes:
	2-13-15	2:00				
Relinquished by:	Date:	Time:	Received by (Laboratory):	Date:	Time:	
Logged by (Laboratory):	Date:	Time:	Checked by (Laboratory): 2/17/15 0920			

ALS Cooler ID	Cooler Temp	QC Package: (Check Box Below)	
		☐ Level II: Standard QC	☐ Level III: Raw Data
		☐ TRRP LRC	☐ TRRP Level IV
		☐ Level IV: SW846 Methods/CLP like	
		☐ Other:	

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C

Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS.

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PC Shar

Cooler Receipt and Preservation Form

Client / Project: Custom Stack Service Request **K15** 01554

Received: 2/17/15 Opened: 2/17/15 By: KD Unloaded: 2/17/15 By: TD

1. Samples were received via? ***Mail*** ***Fed Ex*** ***UPS*** ***DHL*** ***PDX*** ***Courier*** ***Hand Delivered***
2. Samples were received in: (circle) ***Cooler*** ***Box*** ***Envelope*** ***Other*** _____ ***NA***
3. Were custody seals on coolers? NA Y N If yes, how many and where? _____

   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected. Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
—	—	—	—	—	—		7729 1079 9075	

4. Packing material: ***Inserts*** ***Baggies*** ***Bubble Wrap*** ***Gel Packs*** ***Wet Ice*** ***Dry Ice*** ***Sleeves*** _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Did all bottles arrive in good condition (unbroken)? *Indicate in the table below.* NA Y N
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Page _____ ***of*** _____

Metals

ALS Environmental—Kelso Laboratory
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ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client:	Custom Stack Analysis, LLC.	**Service Request:**	K1501586
Project:	Swan Point Cemetery/2/5/2015	**Date Collected:**	02/05/15
Sample Matrix:	Misc.	**Date Received:**	02/17/15
		Date Extracted:	02/23/15

Total Metals
Units: Micrograms (µg)
(Field Blank Corrected)

		Front Half Run - 1 (Analytical Fraction 1A)		**Back Half Run - 1 (Analytical Fraction 2A)**		**Total Front Half + Back Half**
Sample Name:		**Cont. 1 & 3**		**Cont. 4**		
Lab Code:		K1501586-001,-002		K1501586-003		
Date Analyzed:		02/26/15		02/26/15		
Analyte	**EPA Method**	**Front Half MRL**		**Back Half MRL**	**Total MRL**	
Chromium	29/200.8	1.0	43.6	0.1	9.8	1.1	53.4

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client:	Custom Stack Analysis, LLC.	**Service Request:**	K1501586
Project:	Swan Point Cemetery/2/5/2015	**Date Collected:**	02/05/15
Sample Matrix:	Misc.	**Date Received:**	02/17/15
		Date Extracted:	02/23/15

Total Metals
Units: Micrograms (µg)
(Field Blank Corrected)

		Front Half Run - 2 (Analytical Fraction 1A)		**Back Half Run - 2 (Analytical Fraction 2A)**		**Total Front Half + Back Half**	
Sample Name:		**Cont. 1 & 3**		**Cont. 4**			
Lab Code:		K1501586-004,-005		K1501586-006			
Date Analyzed:		02/26/15		02/26/15			
Analyte	**EPA Method**	**Front Half MRL**		**Back Half MRL**		**Total MRL**	
Chromium	29/200.8	1.0	21.4	0.1	1.5	1.1	22.9

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client:	Custom Stack Analysis, LLC.	**Service Request:**	K1501586
Project:	Swan Point Cemetery/2/5/2015	**Date Collected:**	02/05/15
Sample Matrix:	Misc.	**Date Received:**	02/17/15
		Date Extracted:	02/23/15

Total Metals
Units: Micrograms (µg)
(Field Blank Corrected)

		Front Half Run - 3 (Analytical Fraction 1A)		**Back Half Run - 3 (Analytical Fraction 2A)**		**Total Front Half + Back Half**	
Sample Name:		**Cont. 1 & 3**		**Cont. 4**			
Lab Code:		K1501586-007,-008		K1501586-009			
Date Analyzed:		02/26/15		02/26/15			
Analyte	**EPA Method**	**Front Half MRL**		**Back Half MRL**		**Total MRL**	
Chromium	29/200.8	1.0	21.3	0.1	4.8	1.1	26.1

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client:	Custom Stack Analysis, LLC.	**Service Request:**	K1501586
Project:	Swan Point Cemetery/2/5/2015	**Date Collected:**	02/05/15
Sample Matrix:	Misc.	**Date Received:**	02/17/15
		Date Extracted:	02/23/15

Total Metals
Units: Micrograms (µg)
(Field Blank Corrected)

		Front Half Run - 4 (Analytical Fraction 1A)		**Back Half Run - 4 (Analytical Fraction 2A)**		**Total Front Half + Back Half**	
Sample Name:		**Cont. 1 & 3**		**Cont. 4**			
Lab Code:		K1501586-010,-011		K1501586-012			
Date Analyzed:		02/26/15		02/26/15			
Analyte	**EPA Method**	**Front Half MRL**		**Back Half MRL**		**Total MRL**	
Chromium	29/200.8	1.0	18.6	0.1	7.2	1.1	25.8

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client:	Custom Stack Analysis, LLC.	**Service Request:**	K1501586
Project:	Swan Point Cemetery/2/5/2015	**Date Collected:**	NA
Sample Matrix:	Misc.	**Date Received:**	02/17/15
		Date Extracted:	02/23/15

Total Metals
Units: Micrograms (µg)

		Front Half Blank		**Back Half Blank**	
Sample Name:		**(Analytical Fraction 1A)**		**(Analytical Fraction 2A)**	
Lab Code:		K1501586-013,-015		K1501586-013,-014	
Date Analyzed:		02/26/15		02/26/15	
Analyte	**EPA Method**	**Front Half MRL**		**Back Half MRL**	
Chromium	29/200.8	1.0	2.6	0.1	0.5

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client:	Custom Stack Analysis, LLC.	**Service Request:**	K1501586
Project:	Swan Point Cemetery/2/5/2015	**Date Collected:**	NA
Sample Matrix:	Misc.	**Date Received:**	NA
		Date Extracted:	02/23/15

Total Metals
Units: Micrograms (µg)

	Sample Name:		**Method Blank - Front Half**		**Method Blank - Back Half**
	Lab Code:		K1501586-MBF		K1501586-MBB
	Date Analyzed:		02/26/15		02/26/15
Analyte	**EPA Method**	**Front Half MRL**		**Back Half MRL**	
Chromium	29/200.8	1.0	ND	0.1	ND

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client:	Custom Stack Analysis, LLC.	**Service Request:**	K1501586
Project:	Swan Point Cemetery/2/5/2015	**Date Collected:**	02/05/15
Sample Matrix:	Misc.	**Date Received:**	02/17/15
		Date Extracted:	02/23/15
		Date Analyzed:	02/26/15

Duplicate Summary
Total Metals
Units: Micrograms (µg)
(Field Blank Corrected)

Sample Name: Back Half Run - 1 (Analytical Fraction 2A)
Lab Code: K1501586-003D

Analyte	EPA Method	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Chromium	29/200.8	0.1	9.8	10.0	9.9	2

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client:	Custom Stack Analysis, LLC.	**Service Request:**	K1501586
Project:	Swan Point Cemetery/2/5/2015	**Date Collected:**	02/05/15
Sample Matrix:	Misc.	**Date Received:**	02/17/15
		Date Extracted:	02/23/15
		Date Analyzed:	02/26/15

Matrix Spike Summary
Total Metals
Units: Micrograms (µg)
(Field Blank Corrected)

Sample Name: Back Half Run - 1 (Analytical Fraction 2A)
Lab Code: K1501586-003S

Analyte	**MRL**	**Spike Level**	**Sample Result**	**Spiked Sample Result**	**Percent Recovery**	**ALS Percent Recovery Acceptance Limits**
Chromium	0.1	4.3	9.8	14.4	107	70-130

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client:	Custom Stack Analysis, LLC.	**Service Request:**	K1501586
Project:	Swan Point Cemetery/2/5/2015	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Analyzed:	02/26/15

Laboratory Control Sample Summary (Front Half)
Total Metals
Units: µg/L (ppb)

Source: CAS Spike Solution

Analyte	**EPA Method**	**True Value**	**Result**	**Percent Recovery**	**ALS Percent Recovery Acceptance Limits**
Chromium	29/200.8	100	102	102	85-115

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client:	Custom Stack Analysis, LLC.	**Service Request:**	K1501586
Project:	Swan Point Cemetery/2/5/2015	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Analyzed:	02/26/15

Laboratory Control Sample Summary (Back Half)
Total Metals
Units: µg/L (ppb)

Source: CAS Spike Solution

Analyte	**EPA Method**	**True Value**	**Result**	**Percent Recovery**	**ALS Percent Recovery Acceptance Limits**
Chromium	29/200.8	10	10.1	101	85-115

Appendix #3

Calibration Data

H-B Instrument - Manufacturing Since 1903
A Division of Bel-Art Products

Triple Accredited/Registered
ISO 9001:2008 Registered Manufacturer
ISO 14001:2004 Registered Manufacturer
ISO/IEC 17025:2005 Accredited Laboratory

H-B Instrument

Thermometer Calibration Report

Traceable to NIST

ilac-MRA ACCREDITED
Calibration Cert. # 2448.01

This laboratory is accredited in accordance with the recognized International Standard **ISO/IEC 17025:2005** General Requirements for the Competence of Testing and Calibration Laboratories. This laboratory also meets the requirements of **ANSI/NCSL Z540-1-1994** and any additional program requirements in the field of calibration. This accreditation also demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated 18 June 2005).

The instrument described below has been examined and tested in H-B Instrument's Calibration Laboratory using controlled constant temperature equipment and standard thermometers traceable to NIST in accordance with our calibration procedure LAB-20 which is based in part on NBS Monograph 150, ASTM Method E-77, NIST SP 1088, and the International Temperature Scale ITS-90. Calibration is traceable to NIST. For a discussion of accuracy obtainable with such thermometers, see NIST SP 250-23. The results stated relate only to the instrument bearing the serial number identified.

This instrument is in good working order and is suitable for calibration. The capillary of the thermometer has been examined under magnification and no discernable capillary irregularities were noted. Strains in the glass revealed by examination under a polarized lens, if any, were judged to be minimal and of no detriment to the function of the instrument.

02/10/2014

Custom Stack Analysis, LLC.
Brian LeMasters
14614 Cenfield St. NE
Alliance OH 44601

Tel: 1-330-525-51 Fax:
Reference No: Verbal
Calibration Due Date: 2/10/2015

Report No.	345717
Serial No	4A6108
Part No	61099-126
Distributor	H-B Instrument
Manufacturer	H-B Instrument/MW
Item	Thermometer, ASTM 66F-86
Range	167/221°F, 0.2°Div., Total Imm., Hg
Tolerance	±0.2°C

Triple Accredited/Registered H B Since 1903 Excellence in Calibration

N.I.S.T. Standard	Instrument Tested	Correction (ITS-90)*	Standard Serial No.	Traceability	Expanded Uncertainty (k=2)	Emer. Stem** Temperature
185.00 ° F	185.06 ° F	-0.06	1285-028-415	CAL125680	± 0.099	°
212.00 ° F	212.02 ° F	-0.02	1285-028-415	CAL125680	± 0.099	°
220.00 ° F	220.00 ° F	0.00	1285-028-415	CAL125680	± 0.110	°

Ambient Air Temperature: 73 ° F **Relative Humidity:** 23 %

* Observed instrument readings should be increased by positive numbers or reduced by negative numbers indicated by a minus (-) sign.
** Emergent Stem Temperature relates to PARTIAL IMMERSION thermometers ONLY.

The best measurement uncertainties associated with our calibration system are ±0.074°C from -80 to -1°C, ±0.041°C at the ice point in melting ice bath, ±0.045°C from 1 to 100°C, ±0.051°C from 101 to 200°C, ±0.047°C from 201 to 300°C, and ±0.052°C from 301 to 400°C. These uncertainties have been calculated using our Work Instruction WI-19 to 22 that utilizes methods found in NIST Technical Note 1297. The reported uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. The uncertainty of measurement is an important factor to consider when evaluating this instrument for conformance to tolerance standards.

Erika Reedy, Calibration Manager
Calibrated By — Title

Amaritza Caballero, Production Assistant
Checked By — Title

H-B Instrument
102 West Seventh Avenue, Trappe, PA 19426-0770 USA
Telephone: (610) 489-5500 • Fax: (610) 489-9100
Email Address: cal@hbinstrument.com
Website Address: www.hbinstrument.com

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This Report of Test may not be reproduced without the express written permission of H-B Instrument

H-B Instrument - Manufacturing Since 1903
A Division of Bel-Art Products

Triple Accredited/Registered
ISO 9001:2008 Registered Manufacturer
ISO 14001:2004 Registered Manufacturer
ISO/IEC 17025:2005 Accredited Laboratory

H-B Instrument

Thermometer Calibration Report

Traceable to NIST

ilac-MRA ACCREDITED
Calibration Cert. # 2448.01

This laboratory is accredited in accordance with the recognized International Standard **ISO/IEC 17025:2005** General Requirements for the Competence of Testing and Calibration Laboratories. This laboratory also meets the requirements of **ANSI/NCSL Z540-1-1994** and any additional program requirements in the field of calibration. This accreditation also demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated 18 June 2005).

The instrument described below has been examined and tested in H-B Instrument's Calibration Laboratory using controlled constant temperature equipment and standard thermometers traceable to NIST in accordance with our calibration procedure LAB-20 which is based in part on NBS Monograph 150, ASTM Method E-77, NIST SP 1088, and the International Temperature Scale ITS-90. Calibration is traceable to NIST. For a discussion of accuracy obtainable with such thermometers, see NIST SP 250-23. The results stated relate only to the instrument bearing the serial number identified.

This instrument is in good working order and is suitable for calibration. The capillary of the thermometer has been examined under magnification and no discernable capillary irregularities were noted. Strains in the glass revealed by examination under a polarized lens, if any, were judged to be minimal and of no detriment to the function of the instrument.

02/10/2014

Custom Stack Analysis, LLC.
Brian LeMasters
14614 Cenfield St. NE
Alliance OH 44601

Tel: 1-330-525-51 Fax:
Reference No: Verbal
Calibration Due Date: 2/10/2015

Report No.	345718
Serial No	4B5200
Part No	61099-046
Distributor	H-B Instrument
Manufacturer	H-B Instrument/MW
Item	Thermometer, ASTM 63F
Range	18/89°F, 0.2°F Div., Total Imm., Hg
Tolerance	±0.2°C

Triple Accredited/Registered · Since 1903 · C-406 · Excellence in Calibration

N.I.S.T. Standard	Instrument Tested	Correction (ITS-90)*	Standard Serial No.	Traceability	Expanded Uncertainty (k=2)	Emer. Stem** Temperature
20.00 ° F	19.98 ° F	0.02	1285-028-415	CAL125680	± 0.151	°
32.00 ° F	32.04 ° F	-0.04	1285-028-415	CAL125680	± 0.092	°
50.00 ° F	50.00 ° F	0.00	1285-028-415	CAL125680	± 0.099	°

Ambient Air Temperature: 73 ° F **Relative Humidity:** 23 %

* Observed instrument readings should be increased by positive numbers or reduced by negative numbers indicated by a minus (-) sign.
** Emergent Stem Temperature relates to PARTIAL IMMERSION thermometers ONLY.

The best measurement uncertainties associated with our calibration system are ±0.074°C from -80 to -1°C, ±0.041°C at the ice point in melting ice bath, ±0.045°C from 1 to 100°C, ±0.051°C from 101 to 200°C, ±0.047°C from 201 to 300°C, and ±0.052°C from 301 to 400°C. These uncertainties have been calculated using our Work Instruction WI-19 to 22 that utilizes methods found in NIST Technical Note 1297. The reported uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. The uncertainty of measurement is an important factor to consider when evaluating this instrument for conformance to tolerance standards.

Calibrated By: Erika Reedy, Calibration Manager
Title

Checked By: Amaritza Caballero, Production Assistant
Title

H-B Instrument
102 West Seventh Avenue, Trappe, PA 19426-0770 USA
Telephone: (610) 489-5500 • Fax: (610) 489-9100
Email Address: cal@hbinstrument.com
Website Address: www.hbinstrument.com

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MONITORING INSTRUMENTS

Columbus
7410 Worthington Galena Rd
Columbus, OH 43085
614-436-4933

Indianapolis
8144 Zionsville Rd
Indianapolis, IN 46268
317-735-2614

Tech: Sam Shults
Date: 11/7/2014

IR - CO2, Oxygen

Asset#	Model	Serial#	Sample Flow	Analog output	Output test
B16422B	CAI 200	P02026	1.0 lpm Sample Driven	10v	passed

Gas NOX	Cylinder #	Concentration %	Response %	Error	Criteria	Pass
CO2					within 2% of Span	
N2	B16957B	0.00	0.00	**0.00**	**0.0**	Yes
High Level	B20730B	19.60	19.60	**0.00**	**0.4**	Yes
Mid Level	B21266B	9.70	9.98	**0.28**	**0.4**	Yes
		Zero Pot =	**5.1**	**Span Pot=**	**4.4**	
Oxygen						
N2	B16957B	0.00	0.00	**0.00**	**0.0**	Yes
High Level	B20730B	19.90	20.90	**1.00**	**0.4**	Yes
Mid Level	B21266B	9.97	9.80	**-0.17**	**0.4**	Yes
		Zero Pot =	**5.8**	**Span Pot=**	**6.9**	

All of the test gases used are NIST traceable and have +/- 1 % accuracy.

BRECHBUHLER SCALES, INC. An ISO Company

SCALE INSPECTION REPORT

538761

FOR CUSTOM STACK 593P - COD

14614 CENFIELD ST ALLIANCE, OH 44601

P.O. _____ DATE 10-7-14

❑ 14941 Liberty Hi Rd. BOWLING GREEN, OH 43402 419-354-2030	❑ 414 Scale St. S.W. CANTON, OH 44706-3096 330-453-2424	❑ 7550 Jacks Lane CLAYTON, OH 45315 937-832-2040	❑ 520 Brookpark Rd. CLEVELAND, OH 44109-5898 216-661-2660	❑ 4070 Perimeter Dr. COLUMBUS, OH 43228 614-274-9009	❑ 1001 Findlay Rd. LIMA, OH 45801 419-228-5021	❑ 1080 National Parkway MANSFIELD, OH 44906 419-529-3006	❑ 9914 Crescent Park Drive WEST CHESTER, OH 4506 513-777-5800
❑ 4005 South Ave. YOUNGSTOWN, OH 44512 330-259-0414	❑ 980 South Marr Rd. COLUMBUS, IN 47201 812-372-8374	❑ 3306 Cavalier Dr. FORT WAYNE, IN 46808 260-496-8469	❑ 5525 Galaeo Court INDIANAPOLIS, IN 46241 317-548-7821	❑ 5200 Grand Avenue PITTSBURGH, PA 15225 412-299-7960	❑ 477 North Pike Rd. SARVER, PA 16055 724-224-7180	❑ 526 31st St. PARKERSBURG, WV 26101 304-428-1792	❑ 100 McJunkin Road NITRO, WV 25143 304-755-0686

TEST WEIGHTS USED ARE CERTIFIED TO COMPLY WITH STANDARD MASSES, AND ARE NIST TRACEABLE.

STATE OF OHIO TRACEABLE TO NIST CALIBRATION LAB TEST REPORT NO. 2013-025

WEIGHT S/N'S GRAM #33

SCALE TECHNICIAN: BRIAN JONES
SIGNATURE

ACCEPTED BY: _____
SIGNATURE

PARTS USED

TAG NO.	MFG	MOD NO.	S/N	LOC.	CAP.	GRAD. SIZE	NORM RNG	CAL FRQ	CLEAN TEST	CAL STICK		NEXT CAL
-	SCOUT PRO O HAUS	SP2001	7124111434	LAB	2000 G --	.1 G --	HI --	6 Months	YES	YES	✓	4-15
	-	-	-				LO --			NO		

	WGHT USED	AS FOUND	DEV.	TOL. +/-	ADJUSTED	AS LEFT	COMMENTS
1	500	501.0	+1	+/-.2%	(YES) / NO	500.0	
2	1000	1001.6	+1.6	+/-.2%	(YES) / NO	1000.0	CALIBRATED
3	1500	1501.8	+1.8	+/-.2%	(YES) / NO	1500.0	
4	2000	2001.9	+1.9	+/-.2%	(YES) / NO	2000.0	PAID IN FULL CHECK # 11405
5					YES / NO		AMOUT $ 153.48
6					YES / NO		

PARTS USED

The above indicated equipment has been tested/calibrated by Brechbuhler Scales, Inc in conformance to ISO 9001 and ANSI/NCSL Z540.

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL WITHOUT THE WRITTEN APPROVAL FROM BRECHBUHLER SCALES, INC.

BRECHBUHLER SCALES, INC. An ISO Company

SCALE INSPECTION REPORT

538760

FOR CUSTOM STACK 593P - COD

14614 CENFIELD ST ALLIANCE, OH 44601

P.O. _____ DATE 10-7-14

❑ 14941 Liberty Hi Rd. BOWLING GREEN, OH 43402 419-354-2030
❑ 414 Scale St. S.W. CANTON, OH 44706-3096 330-453-2424
❑ 7550 Jacks Lane CLAYTON, OH 45315 937-832-2040
❑ 520 Brookpark Rd. CLEVELAND, OH 44109-5898 216-661-2660
❑ 4070 Perimeter Dr. COLUMBUS, OH 43228 614-274-9009
❑ 1001 Findlay Rd. LIMA, OH 45801 419-228-5021
❑ 1080 National Parkway MANSFIELD, OH 44906 419-529-3006
❑ 9914 Crescent Park Drive WEST CHESTER, OH 4506 513-777-5800
❑ 4005 South Ave. YOUNGSTOWN, OH 44512 330-259-0414
❑ 980 South Marr Rd. COLUMBUS, IN 47201 812-372-8374
❑ 3306 Cavalier Dr. FORT WAYNE, IN 46808 260-496-8469
❑ 5525 Galaeo Court INDIANAPOLIS, IN 46241 317-548-7821
❑ 5200 Grand Avenue PITTSBURGH, PA 15225 412-299-7960
❑ 477 North Pike Rd. SARVER, PA 16055 724-224-7180
❑ 526 31st St. PARKERSBURG, WV 26101 304-428-1792
❑ 100 McJunkin Road NITRO, WV 25143 304-755-0686

TEST WEIGHTS USED ARE CERTIFIED TO COMPLY WITH STANDARD MASSES, AND ARE NIST TRACEABLE.

STATE OF OHIO TRACEABLE TO NIST CALIBRATION LAB TEST REPORT NO. 2013-025

WEIGHT S/N'S GRAM #33

SCALE TECHNICIAN: BRIAN JONES SIGNATURE

ACCEPTED BY: _____ SIGNATURE

PARTS USED

TAG NO.	MFG	MOD NO.	S/N	LOC.	CAP.	GRAD. SIZE	NORM RNG	CAL FRQ	CLEAN TEST	CAL STICK	NEXT CAL
-	SARTORIUS	A2005	39080133	LAB	100 GM g	0.1 g	HI - g	6 Months	YES	YES ✓	4-15
	-	-	-				LO - g			NO	

WGHT USED	AS FOUND	DEV.	TOL. +/-	ADJUSTED	AS LEFT	COMMENTS
1 10g	10.0	Ø	+/-.2%	YES / NO	10.0	
2 20g	20.0	Ø	+/-.2%	YES / NO	20.0	
3 50g	50.0	Ø	+/-.2%	YES / NO	50.0	
4 100g	100.0	Ø	+/-.2%	YES / NO	100.0	
5 g				YES / NO		
6 g				YES / NO		

PARTS USED

The above indicated equipment has been tested/calibrated by Brechbuhler Scales, Inc in conformance to ISO 9001 and ANSI/NCSL Z540.

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL FROM BRECHBUHLER SCALES, INC.

BRECHBUHLER SCALES, INC. An ISO Company

SCALE INSPECTION REPORT

538759

FOR CUSTOM STACK 593P - COD

14614 CENFIELD ST ALLIANCE, OH 44601

P.O. _____ DATE 10-7-14

- ❑ 14941 Liberty H Rd. BOWLING GREEN, OH 43402 419-354-2030
- ❑ #1414 Scale St. S.W. CANTON, OH 44706-3096 330-453-2424
- ❑ 7550 Jacks Lane CLAYTON, OH 45315 937-832-2040
- ❑ 520 Brookpark Rd. CLEVELAND, OH 44109-5898 216-661-2660
- ❑ 4070 Perimeter Dr. COLUMBUS, OH 43228 614-274-9009
- ❑ 1001 Findlay Rd. LIMA, OH 45801 419-228-5021
- ❑ 1080 National Parkway MANSFIELD, OH 44906 419-529-3006
- ❑ 9914 Crescent Park Drive WEST CHESTER, OH 45069 513-777-5800
- ❑ 4005 South Ave. YOUNGSTOWN, OH 44512 330-259-0414
- ❑ 980 South Marr Rd. COLUMBUS, IN 47201 812-372-8374
- ❑ 3306 Cavalier Dr. FORT WAYNE, IN 46808 260-496-8469
- ❑ 5525 Galaeo Court INDIANAPOLIS, IN 46241 317-548-7821
- ❑ 5200 Grand Avenue PITTSBURGH, PA 15225 412-299-7960
- ❑ 477 North Pike Rd. SARVER, PA 16055 724-224-7180
- ❑ 526 31st St. PARKERSBURG, WV 26101 304-428-1792
- ❑ 100 McJunkin Road NITRO, WV 25143 304-755-0686

TEST WEIGHTS USED ARE CERTIFIED TO COMPLY WITH STANDARD MASSES, AND ARE NIST TRACEABLE.

STATE OF OHIO TRACEABLE TO NIST CALIBRATION LAB TEST REPORT NO. 2013-025

WEIGHT S/N'S GRAM #33

SCALE TECHNICIAN: BRIAN JONES
SIGNATURE

ACCEPTED BY: [signature]
SIGNATURE

PARTS USED

TAG NO.	MFG	MOD NO.	S/N	LOC.	CAP.	GRAD. SIZE	NORM RNG	CAL FRQ	CLEAN TEST	CAL STICK		NEXT CAL
-	OHAUS	ADVENTURER	1203240794	LAB	4100 g	.1 g	HI - g	6 Months	YES	YES	✓	4-15
	-	-	-				LO - g			NO		

	WGHT USED	AS FOUND	DEV.	TOL. +/-	ADJUSTED	AS LEFT	COMMENTS
1	10g	10.0	Ø	+/-.2%	YES / NO	10.0	
2	20g	20.0	Ø	+/-.2%	YES / NO	20.0	
3	50g	50.0	Ø	+/-.2%	YES / NO	50.0	
4	100g	100.0	Ø	+/-.2%	YES / NO	100.0	
5	1kg	1000.0	Ø	+/-.2%	YES / NO	1000.0	
6	2kg	2000.0	Ø	+/-.2%	YES / NO	2000.0	

PARTS USED

The above indicated equipment has been tested/calibrated by Brechbuhler Scales, Inc. in conformance to ISO 9001 and ANSI/NCSL Z540.

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL FROM BRECHBUHLER SCALES, INC.

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

ACCREDITED

Calibration Certificate No. 1750.01

Cert. No.: 1870-6244729

Traceable® Certificate of Calibration for Digital Barometer Module

Cust ID:Custom Stack Analysis, LLC, 14614 Cenfield St NE, Attn: Brian Lemasters, Alliance, OH 44672 U.S.A. (RMA:989790)

Instrument Identification:

Model: 1870 S/N: 90724105 Manufacturer: Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Digital Barometer	D4540001	9/15/15	1000362707
Chilled Mirror Hygrometer	31874/H2048MCR	9/19/15	12305
Digital Thermometer	221197993	9/29/15	4000-6241387

Certificate Information:

Technician: 57 Procedure: CAL-31 Cal Date: 9/26/14 Due Date: 9/26/15

Test Conditions: 23.5°C 39.0 %RH 1018 mBar

Calibration Data:

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
mb/hPa	804.90	807	Y	806.75	810	Y	796	817	0.70	>4:1
mb/hPa	908.52	910	Y	909.60	911	Y	899	920	0.70	>4:1
mb/hPa	1,013.30	1,013	Y	1,012.65	1,013	Y	1,002	1,023	0.70	>4:1
°C	23.030	22	Y	24.243	24	Y	23	25	0.58	1.7:1
%RH	41.520	31	N	39.040	31	Y	29	49	1.3	>4:1

This Instrument was calibrated using Instruments Traceable to National Institute of Standards and Technology.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ±U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min = As Left Nominal(Rounded) - Tolerance; Max = As Left Nominal(Rounded) + Tolerance; Date=MM/DD/YY

Nicol Rodriguez, Quality Manager

Aaron Judice, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Digital Barometer Module should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Digital Barometer Modules change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

CONTROL COMPANY 4455 Rex Road Friendswood, TX 77546 USA
Phone 281 482-1714 Fax 281 482-9448 service@control3.com www.control3.com

Control Company is an ISO 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
Control Company is ISO 9001:2008 Quality Certified by (DNV) Det Norske Veritas, Certificate No. CERT-01805-2006-AQ-HOU-RvA.
International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).

Traceable® is a registered trademark of Control Company

© 2009 Control Company

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

ACCREDITED
Calibration
Certificate No. 1750.01

Cert. No.: 1870-6244733

Traceable® Certificate of Calibration for Digital Barometer Module

Cust ID:Custom Stack Analysis, LLC, 14614 Cenfield St NE, Attn: Brian Lemasters, Alliance, OH 44672 U.S.A. (RMA:989790)

Instrument Identification:

Model: 23609-208 S/N: 41370014 Manufacturer: Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Digital Barometer	D4540001	9/15/15	1000362707
Chilled Mirror Hygrometer	31874/H2048MCR	9/19/15	12305
Digital Thermometer	221197993	9/29/15	4000-6241387

Certificate Information:

Technician: 57 Procedure: CAL-31 Cal Date: 9/26/14 Due Date: 9/26/15

Test Conditions: 23.5°C 39.0 %RH 1018 mBar

Calibration Data:

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
mb/hPa	804.90	802	Y	806.75	804	Y	796	817	0.70	>4:1
mb/hPa	908.52	907	Y	909.60	908	Y	899	920	0.70	>4:1
mb/hPa	1,013.30	1,012	Y	1,012.65	1,011	Y	1,002	1,023	0.70	>4:1
°C	23.030	23	Y	24.243	24	Y	23	25	0.58	1.7:1
%RH	41.520	31	N	39.040	30	Y	29	49	1.3	>4:1

This Instrument was calibrated using Instruments Traceable to National Institute of Standards and Technology.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ±U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min = As Left Nominal(Rounded) - Tolerance; Max = As Left Nominal(Rounded) + Tolerance; Date=MM/DD/YY

Nicol Rodriguez, Quality Manager

Aaron Judice, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Digital Barometer Module should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Digital Barometer Modules change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

CONTROL COMPANY 4455 Rex Road Friendswood, TX 77546 USA
Phone 281 482-1714 Fax 281 482-9448 service@control3.com www.control3.com

Control Company is an ISO 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
Control Company is ISO 9001:2008 Quality Certified by (DNV) Det Norske Veritas, Certificate No. CERT-01805-2006-AQ-HOU-RvA.
International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).

Traceable® is a registered trademark of Control Company © 2009 Control Company

THERMOCOUPLE CALIBRATIONS FOR SOURCE SAMPLING APPARATUS

CALIBRATION DATE 2-3-15 BY Brian C

FACILITY Swan Point

UNIT NO _____ SERIAL NO. _____ Pb 29.18

CALIBRATED IN ICE WATER AND BOILING WATER USING A CMS PRECISION GLASS THERMOMETER NO. 229-054, ASTM NO. 63F FOR ICE WATER AND CMS NO. 229-088, ASTM NO. 66F FOR BOILING WATER.

TC	ICE WATER PRECISION	ICE WATER TC	BOILING WATER PRECISION	BOILING WATER TC
CONDENSOR THERMOCOUPLES				
C-1	32	32	212	212
C-2	32		212	
C-3	32	32	212	212
C-4	32		212	
C-5	32		212	
PROBE THERMOCOUPLES				
2P-1	32		212	
2P-2	32		212	
2P-3	32		212	
3P-1	32		212	
3P-2	32		212	
3P-3	32		212	
3P-4	32		212	
4P-1	32	32	212	212
4P-2	32	32	212	211
4P-3	32		212	
4P-4	32		212	
6P-1	32		212	
6P-2	32		212	
6P-3	32		212	
6P-4	32		212	
8P-1	32		212	
8P-2				
8P-3				

THERMOCOUPLE TEMPERATURES ARE READ ON THE DTI USED DURING TEST.
DTI CALIBRATED BY ALTEK 22 TC SOURCE S# 243783 PRIOR TO TC CAL.

THERMOCOUPLE CALIBRATIONS FOR SOURCE SAMPLING APPARATUS

CALIBRATION DATE 2-3-15 BY Brian L

UNIT NO. _____ SERIAL NO. _____ Pb 29.18

CALIBRATED IN ICE WATER AND BOILING WATER USING A CMS PRECISION GLASS THERMOMETER NO. 229-054, ASTM NO. 63F FOR ICE WATER AND CMS NO. 229-088, ASTM NO. 66F FOR BOILING WATER.

TC	ICE WATER PRECISION	ICE WATER TC	BOILING WATER PRECISION	BOILING WATER TC
OVEN THERMOCOUPLES				
O-3	32	32	212	212
O-4	32		212	
O-5	32		212	
O-6	32	32	212	212
O-7	32		212	
O-8	32		212	
O-9	32		212	
STACK THERMOCOUPLES				
2S-1	32		212	
2S-2	32		212	
2S-3	32		212	
3S-1	32		212	
3S-2	32		212	
3S-3	32		212	
4S-1	32	32	212	212
4S-2	32	31	212	212
4S-3	32		212	
6S-1	32		212	
6S-2	32		212	
6S-3	32		212	
6S-4	32		212	
8S-1	32		212	
8S-2				
8S-3				

THERMOCOUPLE TEMPERATURES ARE READ ON THE DTI USED DURING TEST.
DTI CALIBRATED BY ALTEK 22 TC SOURCE S# 243783 PRIOR TO TC CAL.

THERMOCOUPLE CALIBRATIONS FOR SOURCE SAMPLING APPARATUS

CALIBRATION DATE 2-3-15 BY Brian L

UNIT NO _____ SERIAL NO. _____ Pb 29.18

CALIBRATED IN ICE WATER AND BOILING WATER USING A CMS PRECISION GLASS THERMOMETER NO. 229-054, ASTM NO. 63F FOR ICE WATER AND CMS NO. 229-088, ASTM NO. 66F FOR BOILING WATER.

	ICE WATER			BOILING WATER		
TC STACK THERMOCOUPLE	PRECISION		TC	PRECISION		TC
12S-1	32			212		
PROBE THERMOCOUPLES						
12P-1	32			212		
12P-2	32			212		
12P-3	32			212		
METER THERMOCOUPLES - UNIT 001						
M-1	32			212		
M-2	32			212		
METER THERMOCOUPLES - UNIT 002	32			212		
M-1	32		32	212		212
M-2			32			212
METER THERMOCOUPLES - UNIT 003	32			212		
M-1	32		32	212		212
M-2			32			212
METER THERMOCOUPLES - UNIT 004	32			212		
M-1	32			212		
M-2	32			212		
METER THERMOCOUPLES - UNIT 15						
M-1	32			212		
M-2	32			212		
METER THERMOCOUPLES - UNIT 17						
M-1	32			212		
M-2	32			212		
METER THERMOCOUPLES - UNIT 18						
M-1	32			212		
M-2						

THERMOCOUPLE TEMPERATURES ARE READ ON THE DTI USED DURING TEST.
DTI CALIBRATED BY ALTEK 22 TC SOURCE S# 243783 PRIOR TO TC CAL.

Nozzle Calibration Data

Facility: S Wan Point

Date: 2-5-15

Location: Outlet

Source: #1 Incinerator

Method: 1-5

Analyst: Brian L

Run #1

			Mean
.420	.420	.419	.420

Run #2

			Mean
.420	.420	.420	.420

Run #3

			Mean
.420	.419	.420	.420

Client: Swan Point

Pitot Tube Inspection

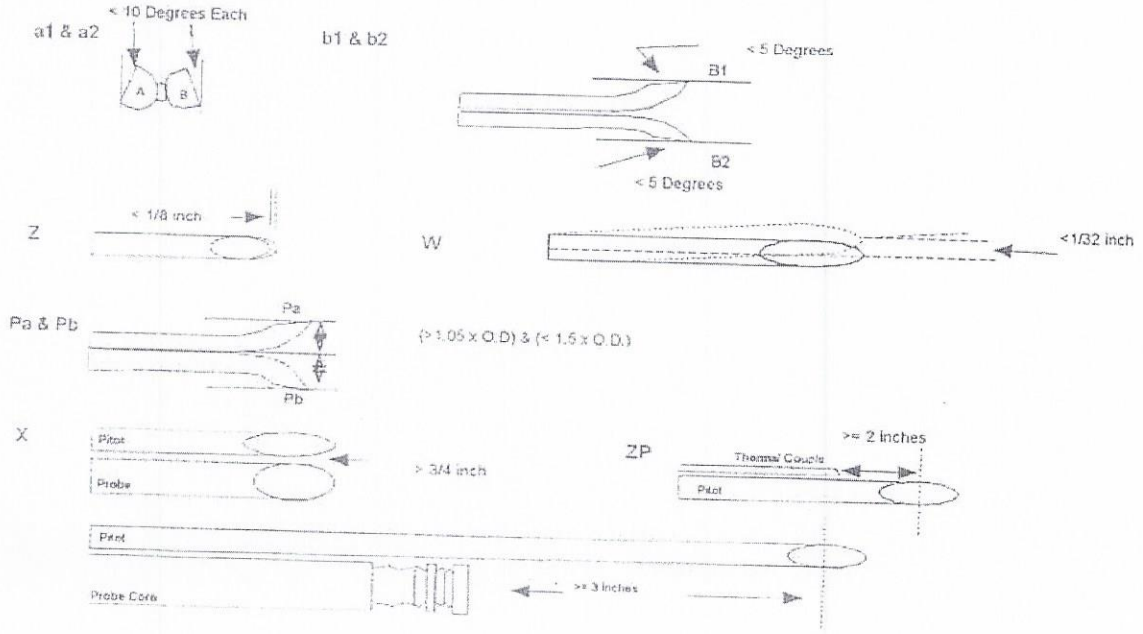
Date: 2-3-15

Probe/Pitot Number	2/P-1	A (Pa + Pb)	.910
Level and Perpendicular	yes	Zs= A tan Y (< 0.125")	.081
Obstruction?	no	Ws= A tan 0 (< 0.03125")	0
Damaged?	no	D_t (0.1875" < D_t < 0.375")	.375
a_1 (-10° < a_1< +10°)	0	P_a (1.05 D_t < P_a < 1.5 D_t)	.457
a_2 (-10° < a_2< +10°)	0	P_b (1.05 D_t < P_b < 1.5 D_t)	.453
b_1 (-5° < b_1< +5°)	0	Pa = Pb ± 0.063"	.004
b_2 (-5° < b_2< +5°)	0		

Probe Minimum Interferences

Y (>= 3.0")		D_n	
X (> .75")		X /D_n (>= 1.5")	
Zp (>= .75")			

Pa	Distance between where pitots adjoin to tip of pitot (Must be between 1.05 & 1.50 times O.D. of tubing)
Pb	Distance between where pitots adjoin to tip of pitot (Must be between 1.05 & 1.50 times O.D. of tubing)
Dt	Diameter of pitot tube (0.375 inches on all pitots)
Zs	Distance between the tip of the impact and static line along the length of the pitot (Must be <1/8 inch(0.1250))
Ws	Spacing between Pitot tubes where welded together (Must be <1/32 inch (0.0313))
a1	Angle across opening of Pitot tube from side to side or perpendicular to length of probe (Must be <10 Deg)
a2	Angle across opening of Pitot tube from side to side or perpendicular to length of probe (Must be <10 Deg)
b1	Angle across opening of Pitot tube from side to side or perpendicular to length of probe (Must be <5 Deg)
b2	Angle across opening of Pitot tube from side to side or perpendicular to length of probe (Must be <5 Deg)
X	Distance between side of nozzle and side of pitot tube (Must be >3/4 inch)
Zp	Distance from center of pitot opening back to tip of thermal couple (Must be >=3/4 inch (0.75))
Y	Distance from center of pitot opening back to probe (Must be >=3 inches)



APEX INSTRUMENTS
EPA Method 5
560 Series Meter Box Calibration
Pre-Test Orifice Method
Metric Meter Box Volume Units, English K' Factor

Filename: \\JAMESGRAY-PC\Customer Project Files\APPENDIX\Cal Sheets\Meter Boxes\[Meter Box 2 121314.xls]A
Revised: 7/25/95 Version: 2.2

CONVERSION FACTORS

1 mm Hg =	0.13330	kPa
1 inch =	0.39370	cm
1 inch =	0.03937	mm
1 cu ft =	28.32	liters

Model #: 2
Serial #:

Date: ----------> 12/13/2014
Barometric Pressure: ----------> 28.7 (in. Hg)
Theoretical Critical Vacuum:---> 13.54 (in. Hg)

!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!

---------- DRY GAS METER READINGS ----------									-CRITICAL ORIFICE READINGS-						-- Average Temperatures --		
dH (in H2O)	Time (min)	Volume Initial (ft^3)	Volume Final (ft^3)	Volume Total (liters)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	Ambient Temperature Initial (deg F)	Ambient Temperature Final (deg F)	Ambient Temperature Average (deg F)	DGM Outlet (deg R)	DGM Overall (deg R)	Ambient Temp (deg R)
0.44	10	947.431	951.418	112.91184	46	41	51	44	12	0.31316523	15	61	60	60.5	502.5	505.5	520.5
0.85	10	951.418	956.824	153.09792	49	45	54	48	16	0.4236044	15	60	60	60	506.5	509	520
1.3	10	956.824	963.317	183.88176	53	50	57	51	19	0.50749902	15	63	60	61.5	510.5	512.75	521.5
2	5	963.317	967.413	115.99872	56	52	58	52	23	0.64034715	15	60	60	60	512	514.5	520
3.7	5	967.413	972.858	154.2024	57	52	60	54	31	0.85389467	14	61	61	61	513	515.75	521

********** RESULTS **********

--- DRY GAS METER ---		-------- ORIFICE --------			-- DRY GAS METER --		-------- ORIFICE --------		
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	CALIBRATION FACTOR Y Value (number)	CALIBRATION FACTOR Y Variation (number)	CALIBRATION FACTOR dH@ Value (in H2O)	CALIBRATION FACTOR dH@ Value (mm H2O)	CALIBRATION FACTOR dH@ Variation (in H2O)
3.9975587	113.21	3.9395359	111.56766	4.05028	0.98549	-0.00573	1.60729735	40.83	-0.10639
5.3886934	152.61	5.3313929	150.98505	5.476	0.98937	-0.00185	1.68200714	42.72	-0.03168
6.43227	182.16	6.3780798	180.62722	6.56998	0.99158	0.00036	1.78335356	45.30	0.06967
4.0511161	114.73	4.029635	114.11926	4.13893	0.9947	0.00348	1.71331955	43.52	-0.00037
5.3955607	152.8	5.368307	152.03045	5.52452	0.99495	0.00373	1.78245848	45.27	0.06877
			Average Y ------->		0.99121		1.71368721	43.53	<------- Average dH@

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

SIGNED:_____ Jim Gray

Date:_____ 12/13/2014

Airgas

Airgas USA, LLC
2009 Bellaire Ave.
Royal Oak, MI 48067-8020
248-399-8020
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Customer:	Custom Stack Analysis LLC		
Part Number:	E02NI99E15A3193	Reference Number:	32-400105076-1
Cylinder Number:	CC315588	Cylinder Volume:	144 Cu.Ft.
Laboratory:	MIC - Royal Oak-32 (SAP) - MI	Cylinder Pressure:	2015 PSIG
PGVP Number:	B62012	Valve Outlet:	350
Gas Code:	APPVD	Analysis Date:	Oct 22, 2012

Expiration Date: Oct 22, 2020

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig. i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	26.00 PPM	25.88 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	9061816	CC273612	24.35PPM CARBON MONOXIDE/NITROGEN	Oct 02, 2013

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
E/N 54, 100ppmFS CO, Nicolet 6700	Fourier Transform Infrared (FTIR)	Oct 10, 2012

Triad Data Available Upon Request

Notes:

Approved for Release

Airgas

Airgas USA, LLC
2009 BELLAIRE AVENUE
ROYAL OAK, MI 48067
248-399-8020
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Customer:	CUSTOM STACK ANALYSIS LLC		
Part Number:	E03NI99E15A0456	Reference Number:	32-400399263-1
Cylinder Number:	CC122461	Cylinder Volume:	144.3 CF
Laboratory:	MIC - Royal Oak-32 (SAP) - MI	Cylinder Pressure:	2015 PSIG
PGVP Number:	B62014	Valve Outlet:	660
Gas Code:	CO,NO,BALN	Certification Date:	Aug 04, 2014

Expiration Date: Aug 04, 2022

Certification performed in accordance with "EPA Traceability Protocol for Assay and Certification of Gaseous Calibration Standards (May 2012)" document EPA 600/R-12/531, using the assay procedures listed. Analytical Methodology does not require correction for analytical interference. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.

Do Not Use This Cylinder below 100 psig, i.e. 0.7 megapascals.

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty	Assay Dates
NOX	50.00 PPM	50.50 PPM	G1	+/- 1.2% NIST Traceable	07/28/2014, 08/04/2014
CARBON MONOXIDE	50.00 PPM	49.96 PPM	G1	+/- 1.0% NIST Traceable	07/28/2014
NITRIC OXIDE	50.00 PPM	50.43 PPM	G1	+/- 1.1% NIST Traceable	07/28/2014, 08/04/2014
NITROGEN	Balance				

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Uncertainty	Expiration Date
NTRM	12062138	CC367601	25.24 PPM CARBON MONOXIDE/NITROGEN	+/-0.6%	May 15, 2018
PRM	12329	726612	25.02 PPM NITROGEN DIOXIDE/NITROGEN	+/- 1.5%	Oct 15, 2014
NTRM	13061244	CC403937	49.40 PPM NITRIC OXIDE/NITROGEN	+/-0.80%	Nov 19, 2019
GMIS	A124199110104	CC323259	15.05 PPM NITROGEN DIOXIDE/NITROGEN	+/- 1.6%	Nov 08, 2016

The SRM, PRM or RGM noted above is only in reference to the GMIS used in the assay and not part of the analysis.

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
E/N 54 Nicolet 6700 CO	FTIR	Jul 01, 2014
E/N 54 Nicolet 6700 NO	FTIR	Jul 31, 2014
E/N 54 Nicolet 6700 NO2	FTIR	Jul 14, 2014

Triad Data Available Upon Request

Approved for Release

Airgas

Airgas USA, LLC
2009 Bellaire Ave.
Royal Oak, MI 48067-8020
248-399-8020
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Customer:	Custom Stack Analysis LLC		
Part Number:	E03NI56E15A1055	Reference Number:	32-400074089-1
Cylinder Number:	CC49510	Cylinder Volume:	162 Cu.Ft.
Laboratory:	MIC - Royal Oak-32 (SAP) - MI	Cylinder Pressure:	2015 PSIG
PGVP Number:	B62012	Valve Outlet:	590
Gas Code:	OC2	Analysis Date:	Jul 19, 2012

Expiration Date: Jul 19, 2015

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	22.00 %	21.79 %	G1	+/- 1% NIST Traceable
OXYGEN	22.00 %	22.41 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM	6060823	CC207967	22.51% OXYGEN/NITROGEN	May 01, 2016
NTRM	12061523	CC354781	19.87% CARBON DIOXIDE/NITROGEN	Jan 27, 2018

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
E/N 173, 25% CO2, SIEMENS ULTRAMAT 6	Nondispersive Infrared(NDIR)	Jul 19, 2012
E/N 51, 25%FS O2, Rosemont 755R	Paramagnetic (Para)	Jul 13, 2012

Triad Data Available Upon Request

Notes:

Approved for Release

Nozzle Calibration Data

Facility: Swan Point

Date: 2-6-15

Location: Outlet

Source: #2 Incinerator

Method: 1-5

Analyst: Brian L

Run #1

			Mean
.420	.420	.420	.420

Run #2

			Mean
.419	.420	.420	.420

Run #3

			Mean
.420	.420	.420	.420

LIQUID TECHNOLOGY CORPORATION

"INDUSTRY LEADER IN SPECIALTY GASES"

Certificate of Analysis

- EPA PROTOCOL GAS -

Customer	IE Monitoring Instruments (Worthington, OH)
Date	March 07, 2014
Delivery Receipt	DR-50692
Gas Standard	10.0% CO2, 10.0% Oxygen/Nitrogen - EPA PROTOCOL
Final Analysis Date	February 17, 2014
Expiration Date	February 17, 2022

Component	Carbon Dioxide, Oxygen
Balance Gas	Nitrogen

Analytical Data:
EPA Protocol, Section No. 2.2, Procedure G-1

DO NOT USE BELOW 100 psig

Reported Concentrations

Carbon Dioxide: 9.90% +/- 0.08%
Oxygen: 10.1% +/- 0.06%
Nitrogen: Balance

Reference Standards:

SRM/GMIS:	GMIS	GMIS
Cylinder Number:	EB-0026839	CC-231332
Concentration:	13.92% CO2	9.97% Oxygen/Nitrogen
Expiration Date:	10/03/20	04/06/14

Certification Instrumentation

Component:	Carbon Dioxide	Oxygen
Make/Model:	Nicolet 6700	Servomex 244a
Serial Number:	APW1100563	1847
Principal of Measurement:	FTIR	Paramagnetic
Last Calibration:	February 05, 2014	February 05, 2014

Cylinder Data

Cylinder Serial Number:	CC-125617	Cylinder Outlet:	CGA 590
Cylinder Volume:	135 Cubic Feet	Cylinder Pressure:	1925 psig, 70°F

Analytical Uncertainty and NIST Traceability are in compliance with EPA-600/R-12/531.

Certified by: Cole Dylewski

Cole Dylewski

PGVP Vendor ID: E12014

"UNMATCHED EXCELLENCE"
2048 APEX COURT APOPKA, FLORIDA 32703 ~ PHONE (407)-292-2990 FAX (407)-292-3313
WWW.LIQUIDTECHCORP.COM
APOPKA, FL • HOUSTON, TX

Calibration Certificate No. 1750.01

Calibration complies with ISO/IEC 17025, ANSI/NCSL Z540-1, and 9001

Cert. No.: 3415-5225577

Traceable® Certificate of Calibration for Digital Calipers

Manufactured for and distributed by: Fisher Scientific, 300 Industry Drive, Pittsburgh, PA 15275-1001

Instrument Identification:

Model Numbers: 14-648-17, FB70250, 32599 S/N: 130402110 Manufacturer: Control Company

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Gage Set	99146223	10/08/13	1000325819

Certificate Information:

Technician: 57 Procedure: CAL-05 Cal Date: 7/16/13 Cal Due: 7/16/15

Test Conditions: 22.5°C 46.0 %RH 1017 mBar

Calibration Data: (New Instrument)

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
in		N.A.		0.0000	0.0000	Y	-0.0010	0.0010	0.0003	3.3:1
in		N.A.		0.1000	0.1000	Y	0.0990	0.1010	0.0003	3.3:1
in		N.A.		2.0000	1.9995	Y	1.9980	2.0020	0.0003	>4:1
in		N.A.		4.0000	4.0000	Y	3.9960	4.0040	0.0004	>4:1
in		N.A.		6.0000	6.0020	Y	5.9940	6.0060	0.0004	>4:1
in depth		N.A.		2.0000	2.0000	Y	1.9980	2.0020	0.0003	>4:1
in step		N.A.		2.0000	2.0000	Y	1.9990	2.0010	0.0004	2.7:1
in inside		N.A.		1.0000	1.0000	Y	0.9990	1.0010	0.0003	3.1:1

This Instrument was calibrated using Instruments Traceable to National Institute of Standards and Technology.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ±U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min = As Left Nominal(Rounded) - Tolerance; Max = As Left Nominal(Rounded) + Tolerance; Date=MM/DD/YY

Aaron Judice, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Digital Calipers should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Digital Calipers change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

CONTROL COMPANY 4455 Rex Road Friendswood, TX 77546 USA
Phone 281 482-1714 Fax 281 482-9448 service@control3.com www.control3.com

Control Company is an ISO 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
Control Company is ISO 9001:2008 Quality Certified by (DNV) Det Norske Veritas. Certificate No. CERT-01805-2006-AQ-HOU-RvA.
International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).

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800.828.1470
Better by every measure

NVLAP®

NVLAP LAB CODE
200867-0

CERTIFICATE OF CALIBRATION

Customer: CUSTOM STACK ANALYSIS
14614 CENFIELD STREET NE
ALLIANCE, OH 44601

Customer Nbr: 1-597810-000
PO Nbr: 00-20813
Date Received: January 22, 2015

Cert/SO Nbr: 15-CY7AH-2-1
Manufacturer: Altek Industries Corp
Model Nbr: 22

Date Completed: January 22, 2015
Due Date: January 22, 2016

Description: Thermocouple Calibrator
Serial Nbr: 243783
ID Nbr: NONE
Unit Barcode: 901B0096753

Calibrated To: Manufacturer Specification
Calibration Proc: 1-AC06679-5
Item Received: In Tolerance
Item Returned: In Tolerance

Transcat Calibration Laboratories have been audited and found in compliance with ISO/IEC 17025:2005. Accredited calibrations performed within the Lab's Scope of Accreditation are indicated by the presence of the Accrediting Body's Logo and Certificate Number on this Certificate of Calibration. Any measurements on an accredited calibration not covered by that Lab's Scope are listed in the notes section of the certificate. This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Transcat calibrations, as applicable, are performed in compliance with the requirements of ISO 9001:2008, ISO TS16949:2009, ANSI/NCSL Z540.1-1994 (R2002), and ISO 10012:2003. When specified contractually, the requirements of 10CFR21, 10CFR50 App. B and ASME NQA-1:2012 are also covered.

Metrological Traceability includes no less than: An unbroken chain of comparison, realization of SI units, measurement uncertainty (MU), documentation, competence, periodic recalibration, and measurement assurance. Transcat documents the traceability of measurements to the SI units through the National Institute of Standards and Technology (NIST) or the National Research Council of Canada (NRC), or other recognized national measurement institutes (NMI's) or international standard bodies, or to measurable conditions created in our laboratory, or accepted fundamental and/or natural physical constants, ratio type of calibration, or by comparison to consensus standards. The specific path of traceability for the reported measurement results is maintained at the Transcat facility and is available there for review. Uncertainty of the measurement is required for further dissemination of traceability.

Complete records of work performed are maintained by Transcat and are available for inspection. Laboratory standards used in the performance of this calibration are shown on the Supplemental Report.

The results in this report relate only to the item calibrated or tested, and the determination of in or out of tolerance is specific to the model/serial no. referenced above based on the tolerances shown on the supplemental report; these tolerances are either the original equipment manufacturer's(OEM's) warranted specifications or the client's requested specifications.

Uncertainties are reported with a coverage factor k=2, providing a level of confidence of approximately 95%. The Test Uncertainty Ratio (TUR) is calculated as per NCSL International RP-9, section 8.2. All calibrations have been performed using processes having a TUR of 4:1 or better (3:1 for mass calibrations), unless otherwise noted on the Supplemental Report. Calibrations at these TUR thresholds (or greater) provide reasonable confidence that the instrument is within the stated tolerances. For mass calibrations: Conventional mass referenced to 8.0 g/cm³.

Any number of factors can cause a unit to drift out of tolerance at any time following its calibration. Limitations on the uses of this instrument are detailed in the OEM's operating instructions.

Notes:

Calibrated At:
2056 S. Alex Road
West Carrollton, OH 45449
By: Mike Morrison
Digitally Signed On January 22, 2015

Facility Responsible:
2056 S. Alex Road
West Carrollton, OH 45449
937-866-1033

Digitally Signed By Marc Rhoades for
Date: January 23, 2015

Derek Atkinson
Lab Manager

Revision 0

F0013R27 11/03/14

This certificate may not be reproduced except in full, without the written approval of Transcat. Additional information, if applicable may be included on separate report(s).

Appendix #4

Monitoring Data

Note: Silica Gel used in the gas stream prior entering CO Analyzer

Swan Point Cemetery
FTC Model FT II Human Crematory Outlet

CO response time = 90 sec
CO2/O2 response time = 45 sec

O2	Cal	Monitor
High	22.41	22.4
Low	10.1	10.1
Zero	0	0

CO2	Cal	Monitor
High	21.79	21.8
Low	9.9	10
Zero	0	0.2

CO	Cal	Monitor
High	49.96	50
Low	25.88	26
Zero	0	0

CO	CO2	O2	Time Stamp	
0.12	10.02	10.12	2/5/2015 8:483:29 AM	CO2,O2BiasCOZero
0.12	5.92	6.37	2/5/2015 8:44:33 AM	
4.27	0.47	0.06	2/5/2015 8:45:38 AM	
22.34	0.46	0.05	2/5/2015 8:46:42 AM	
25.44	0.47	0.05	2/5/2015 8:47:47 AM	
26.08	0.47	0.05	2/5/2015 8:48:51 AM	COBiasCO2,O2Zero
26.12	0.47	8.57	2/5/2015 8:49:56 AM	
23.07	0.46	21.06	2/5/2015 8:51:00 AM	
7.57	0.47	21.07	2/5/2015 8:52:05 AM	
1.59	0.47	21.07	2/5/2015 8:53:09 AM	
0.12	0.46	21.06	2/5/2015 8:54:14 AM	
0.12	0.46	21.05	2/5/2015 8:55:18 AM	
0.12	0.47	21.05	2/5/2015 8:56:33 AM	
0.12	8.81	21.03	2/5/2015 8:57:27 AM	
0.12	50.37	20.98	2/5/2015 8:58:33 AM	
0.12	50.28	20.99	2/5/2015 8:59:36 AM	
0.12	50.09	20.99	2/5/2015 9:00:41 AM	CO Interference Check
0.12	49.98	21.00	2/5/2015 9:01:45 AM	
0.12	50.04	21.01	2/5/2015 9:02:50 AM	
0.12	10.42	21.01	2/5/2015 9:03:54 AM	
0.12	0.47	21.02	2/5/2015 9:04:59 AM	
0.12	0.46	21.02	2/5/2015 9:06:03 AM	
0.12	0.46	21.00	2/5/2015 9:07:08 AM	
0.12	0.46	20.99	2/5/2015 9:08:12 AM	
0.12	0.46	20.99	2/5/2015 9:09:17 AM	
0.12	0.47	20.99	2/5/2015 9:10:22 AM	
0.12	0.47	21.00	2/5/2015 9:11:26 AM	
0.12	0.47	20.99	2/5/2015 9:12:31 AM	
0.12	0.47	20.99	2/5/2015 9:13:35 AM	
0.12	0.47	21.00	2/5/2015 9:14:40 AM	
0.12	0.46	20.99	2/5/2015 9:15:44 AM	
0.12	0.47	21.00	2/5/2015 9:16:49 AM	
0.12	0.46	21.00	2/5/2015 9:17:53 AM	
0.12	0.47	21.00	2/5/2015 9:18:58 AM	
0.12	0.47	21.00	2/5/2015 9:20:02 AM	
0.12	0.47	21.01	2/5/2015 9:21:07 AM	
0.12	0.47	21.01	2/5/2015 9:22:11 AM	
0.12	0.46	21.01	2/5/2015 9:23:16 AM	
0.12	0.47	21.01	2/5/2015 9:24:20 AM	
0.12	0.47	21.01	2/5/2015 9:25:25 AM	
0.12	0.47	21.01	2/5/2015 9:26:29 AM	
0.12	0.47	20.99	2/5/2015 9:27:34 AM	
0.12	0.46	20.99	2/5/2015 9:28:38 AM	
0.12	0.46	21.00	2/5/2015 9:29:43 AM	
0.12	0.46	21.01	2/5/2015 9:30:47 AM	
0.12	0.47	21.01	2/5/2015 9:31:52 AM	
0.12	0.47	21.01	2/5/2015 9:32:56 AM	
0.12	0.47	21.01	2/5/2015 9:34:01 AM	
0.12	0.47	20.99	2/5/2015 9:35:06 AM	

0.12	0.47	20.97	2/5/2015 9:36:10 AM	
0.12	0.47	20.97	2/5/2015 9:37:14 AM	
0.12	0.47	20.98	2/5/2015 9:38:19 AM	
0.12	0.46	20.99	2/5/2015 9:39:23 AM	
0.12	0.47	21.00	2/5/2015 9:40:28 AM	
0.12	0.47	21.00	2/5/2015 9:41:33 AM	
0.12	0.47	21.00	2/5/2015 9:42:37 AM	
0.12	0.47	21.00	2/5/2015 9:43:42 AM	
0.12	0.47	21.00	2/5/2015 9:44:46 AM	
0.12	0.47	21.00	2/5/2015 9:45:51 AM	
0.12	0.47	21.00	2/5/2015 9:46:55 AM	
0.12	0.47	21.01	2/5/2015 9:48:00 AM	
0.12	0.46	21.01	2/5/2015 9:49:04 AM	
0.12	0.46	21.01	2/5/2015 9:50:09 AM	
0.12	0.47	21.01	2/5/2015 9:51:13 AM	
0.12	0.47	21.01	2/5/2015 9:52:18 AM	
0.12	0.47	21.01	2/5/2015 9:53:22 AM	
0.12	0.47	21.01	2/5/2015 9:54:27 AM	
0.12	0.47	21.00	2/5/2015 9:55:31 AM	
0.12	0.47	21.00	2/5/2015 9:56:36 AM	
0.12	0.47	21.01	2/5/2015 9:57:40 AM	
0.12	0.47	21.01	2/5/2015 9:58:45 AM	
0.12	0.47	21.01	2/5/2015 9:59:49 AM	
0.12	0.46	21.01	2/5/2015 10:00:54 AM	
0.24	0.47	21.00	2/5/2015 10:01:58 AM	
1.95	0.47	21.00	2/5/2015 10:03:03 AM	
3.17	2.14	17.80	2/5/2015 10:04:07 AM	
3.17	5.25	12.07	2/5/2015 10:05:12 AM	
3.91	5.00	12.57	2/5/2015 10:06:16 AM	
3.42	4.84	12.88	2/5/2015 10:07:21 AM	
2.81	4.89	12.80	2/5/2015 10:08:25 AM	
2.20	4.91	12.75	2/5/2015 10:09:30 AM	
1.46	4.91	12.77	2/5/2015 10:10:34 AM	
1.22	4.88	12.83	2/5/2015 10:11:39 AM	
1.59	4.57	13.41	2/5/2015 10:12:43 AM	
8.79	4.79	12.99	2/5/2015 10:13:48 AM	
3.17	4.90	12.78	2/5/2015 10:14:52 AM	
1.46	2.58	17.06	2/5/2015 10:15:57 AM	StartRun1
5.49	4.31	15.87	2/5/2015 10:17:02 AM	
14.77	3.69	16.47	2/5/2015 10:18:06 AM	
8.30	3.72	16.34	2/5/2015 10:19:11 AM	
6.22	4.20	15.71	2/5/2015 10:20:15 AM	
4.39	4.28	15.55	2/5/2015 10:21:20 AM	
3.42	4.01	16.09	2/5/2015 10:22:24 AM	
3.05	3.98	15.96	2/5/2015 10:23:29 AM	
3.05	4.06	15.77	2/5/2015 10:24:33 AM	
3.29	3.93	16.01	2/5/2015 10:25:38 AM	
3.05	3.98	15.93	2/5/2015 10:26:42 AM	
3.42	3.98	15.88	2/5/2015 10:27:47 AM	
3.05	3.88	16.02	2/5/2015 10:28:51 AM	
3.05	3.84	15.98	2/5/2015 10:29:56 AM	
2.68	3.72	16.13	2/5/2015 10:30:00 AM	
3.54	3.60	16.31	2/5/2015 10:32:05 AM	
3.66	3.88	15.78	2/5/2015 10:33:09 AM	
2.81	3.61	16.30	2/5/2015 10:34:14 AM	
2.56	3.77	15.98	2/5/2015 10:35:18 AM	
2.07	3.73	16.12	2/5/2015 10:36:23 AM	
2.20	3.93	15.82	2/5/2015 10:37:27 AM	
2.20	3.94	15.81	2/5/2015 10:38:32 AM	
2.20	3.90	15.86	2/5/2015 10:39:36 AM	
1.95	3.81	15.97	2/5/2015 10:40:41 AM	
1.34	3.81	15.98	2/5/2015 10:41:45 AM	

1.10	3.81	15.98	2/5/2015 10:42:50 AM	
1.10	3.82	15.98	2/5/2015 10:43:54 AM	
1.34	3.77	16.05	2/5/2015 10:44:59 AM	
1.10	2.85	17.38	2/5/2015 10:46:03 AM	
1.10	3.55	16.36	2/5/2015 10:47:08 AM	
1.10	3.53	16.31	2/5/2015 10:48:12 AM	
1.10	3.53	16.24	2/5/2015 10:49:17 AM	
1.10	3.40	16.57	2/5/2015 10:50:21 AM	
1.10	3.71	15.99	2/5/2015 10:51:26 AM	
1.22	3.56	16.32	2/5/2015 10:52:31 AM	
1.10	3.58	16.23	2/5/2015 10:53:35 AM	
1.34	3.71	16.03	2/5/2015 10:54:40 AM	
1.10	3.68	16.11	2/5/2015 10:55:44 AM	
1.22	3.67	16.12	2/5/2015 10:56:49 AM	
0.85	3.63	16.20	2/5/2015 10:57:53 AM	
0.73	3.60	16.25	2/5/2015 10:58:58 AM	
0.12	3.49	16.40	2/5/2015 11:00:02 AM	
0.12	3.55	16.24	2/5/2015 11:01:07 AM	
0.12	3.45	16.42	2/5/2015 11:02:11 AM	
0.12	3.73	15.97	2/5/2015 11:03:16 AM	
0.49	3.72	15.99	2/5/2015 11:04:20 AM	
0.12	3.59	16.20	2/5/2015 11:05:25 AM	
0.12	3.66	16.08	2/5/2015 11:06:29 AM	
0.12	3.65	16.10	2/5/2015 11:07:34 AM	
0.12	3.61	16.13	2/5/2015 11:08:27 AM	
0.12	3.54	16.26	2/5/2015 11:09:32 AM	
0.12	3.45	16.38	2/5/2015 11:10:36 AM	
0.12	3.36	16.52	2/5/2015 11:11:41 AM	
0.12	3.44	16.38	2/5/2015 11:12:45 AM	
0.12	3.43	16.39	2/5/2015 11:13:50 AM	
0.12	3.35	16.50	2/5/2015 11:14:54 AM	
0.49	3.59	16.11	2/5/2015 11:15:59 AM	
1.99	3.69	16.16		Avg 1
0.12	2.01	18.60	2/5/2015 11:17:05 AM	PortChange
0.12	0.47	21.02	2/5/2015 11:18:08 AM	
0.12	0.47	21.02	2/5/2015 11:19:13 AM	
0.12	0.47	21.03	2/5/2015 11:20:18 AM	
0.12	0.46	21.03	2/5/2015 11:21:21 AM	
0.12	0.46	21.02	2/5/2015 11:22:30 AM	
0.37	0.47	21.02	2/5/2015 11:23:31 AM	
0.12	1.17	19.89	2/5/2015 11:24:35 AM	
0.73	2.69	17.78	2/5/2015 11:25:39 AM	
0.24	4.13	15.01	2/5/2015 11:26:44 AM	PortChange
0.85	3.48	16.17	2/5/2015 11:27:49 AM	
0.12	3.56	16.02	2/5/2015 11:28:53 AM	
0.12	3.51	16.11	2/5/2015 11:30:01 AM	
0.12	3.53	16.13	2/5/2015 11:31:02 AM	
0.12	3.53	16.25	2/5/2015 11:32:07 AM	
0.73	3.98	15.18	2/5/2015 11:33:11 AM	
5.37	3.28	16.45	2/5/2015 11:34:16 AM	
8.91	3.05	16.86	2/5/2015 11:35:20 AM	
9.15	2.89	17.14	2/5/2015 11:36:25 AM	
9.15	3.21	16.61	2/5/2015 11:37:29 AM	
6.71	3.29	16.46	2/5/2015 11:38:34 AM	
3.42	3.30	16.42	2/5/2015 11:39:38 AM	
2.32	3.24	16.52	2/5/2015 11:40:43 AM	
2.07	3.15	16.64	2/5/2015 11:41:47 AM	
1.22	3.77	15.46	2/5/2015 11:42:52 AM	
0.49	3.43	16.02	2/5/2015 11:43:56 AM	
0.12	3.18	16.47	2/5/2015 11:45:01 AM	
0.12	2.90	16.96	2/5/2015 11:46:05 AM	

0.49	3.02	16.68	2/5/2015 11:47:10 AM	
0.49	3.26	16.24	2/5/2015 11:48:14 AM	
1.34	3.23	16.29	2/5/2015 11:49:19 AM	
0.49	3.21	16.31	2/5/2015 11:50:23 AM	
0.12	3.16	16.39	2/5/2015 11:51:28 AM	
0.12	3.21	16.30	2/5/2015 11:52:32 AM	
0.12	3.19	16.32	2/5/2015 11:53:37 AM	
0.12	3.16	16.36	2/5/2015 11:54:41 AM	
0.12	3.14	16.39	2/5/2015 11:55:46 AM	
0.12	3.11	16.42	2/5/2015 11:56:50 AM	
0.12	3.12	16.39	2/5/2015 11:57:55 AM	
0.12	3.20	16.24	2/5/2015 11:59:00 AM	
0.12	3.18	16.26	2/5/2015 12:00:04 PM	
0.12	3.14	16.31	2/5/2015 12:01:09 PM	
0.12	3.14	16.31	2/5/2015 12:02:13 PM	
0.12	3.11	16.35	2/5/2015 12:03:18 PM	
0.12	3.10	16.37	2/5/2015 12:04:22 PM	
0.12	3.16	16.24	2/5/2015 12:05:27 PM	
0.37	3.11	16.32	2/5/2015 12:06:31 PM	
0.12	3.10	16.35	2/5/2015 12:07:36 PM	
0.12	3.10	16.35	2/5/2015 12:08:40 PM	
0.12	3.08	16.37	2/5/2015 12:09:45 PM	
0.12	3.08	16.37	2/5/2015 12:10:49 PM	
0.12	3.07	16.38	2/5/2015 12:11:54 PM	
0.12	2.54	17.45	2/5/2015 12:12:58 PM	
0.12	2.99	16.51	2/5/2015 12:14:03 PM	
0.12	3.30	15.92	2/5/2015 12:15:07 PM	
0.61	3.29	15.94	2/5/2015 12:16:12 PM	
0.12	3.27	15.97	2/5/2015 12:17:16 PM	
0.12	3.27	15.96	2/5/2015 12:18:21 PM	
0.12	2.95	16.60	2/5/2015 12:19:25 PM	
0.12	2.50	17.44	2/5/2015 12:20:30 PM	
0.12	3.23	16.03	2/5/2015 12:21:34 PM	
0.12	3.25	15.99	2/5/2015 12:22:39 PM	
0.12	3.25	15.99	2/5/2015 12:23:43 PM	
0.12	3.25	16.04	2/5/2015 12:24:48 PM	
0.12	3.21	16.46	2/5/2015 12:25:52 PM	
0.12	3.19	15.91	2/5/2015 12:26:57 PM	StopRun1
1.05	3.20	16.33		Avg 2
1.52	3.44	16.24		Total Avg
0.73	3.13	15.92	2/5/2015 12:28:01 PM	
0.24	3.10	16.67	2/5/2015 12:29:06 PM	
0.37	3.11	18.24	2/5/2015 12:30:10 PM	
0.12	1.27	20.86	2/5/2015 12:31:15 PM	
0.12	0.47	20.89	2/5/2015 12:32:19 PM	
0.12	0.47	20.89	2/5/2015 12:33:24 PM	
0.12	0.47	20.89	2/5/2015 12:34:29 PM	
0.12	0.47	20.89	2/5/2015 12:35:33 PM	
0.61	0.47	20.88	2/5/2015 12:36:38 PM	
0.12	0.47	20.88	2/5/2015 12:37:42 PM	
0.12	0.47	20.88	2/5/2015 12:38:47 PM	
0.12	0.47	20.88	2/5/2015 12:39:51 PM	
0.12	0.47	20.87	2/5/2015 12:40:56 PM	
0.12	0.47	20.88	2/5/2015 12:42:00 PM	
0.12	0.47	20.97	2/5/2015 12:43:05 PM	
0.12	0.47	20.98	2/5/2015 12:44:09 PM	
0.12	0.47	20.97	2/5/2015 12:45:14 PM	
0.24	0.47	5.46	2/5/2015 12:46:18 PM	
10.25	0.47	0.21	2/5/2015 12:47:23 PM	
25.27	0.47	0.17	2/5/2015 12:48:27 PM	
26.61	0.47	0.10	2/5/2015 12:49:32 PM	COBiasCO2,O2Zero

27.10	0.46	2.95	2/5/2015 12:50:36 PM	
23.56	4.61	10.07	2/5/2015 12:51:41 PM	
7.08	9.80	10.08	2/5/2015 12:52:45 PM	
1.59	9.95	10.09	2/5/2015 12:53:50 PM	
0.12	9.97	10.10	2/5/2015 12:54:54 PM	CO2,O2BiasCOZero
0.12	9.99	10.10	2/5/2015 12:55:59 PM	
0.12	8.77	15.91	2/5/2015 12:57:03 PM	
0.12	1.03	20.93	2/5/2015 12:58:08 PM	
0.12	0.47	20.95	2/5/2015 12:59:12 PM	
0.00	0.47	20.96	2/5/2015 1:00:17 PM	
0.12	0.47	20.97	2/5/2015 1:01:21 PM	
0.12	0.47	20.97	2/5/2015 1:02:26 PM	
0.12	0.47	20.97	2/5/2015 1:03:30 PM	
0.12	0.46	20.97	2/5/2015 1:04:35 PM	
0.12	0.98	17.70	2/5/2015 1:05:39 PM	
0.12	4.70	12.53	2/5/2015 1:06:44 PM	
0.12	5.01	12.67	2/5/2015 1:07:48 PM	
0.73	4.74	13.65	2/5/2015 1:08:53 PM	
0.12	3.88	15.13	2/5/2015 1:09:58 PM	
0.12	2.94	17.04	2/5/2015 1:11:02 PM	StartRun2
0.12	2.98	16.25	2/5/2015 1:12:07 PM	
0.61	4.20	16.22	2/5/2015 1:13:11 PM	
1.10	3.83	16.27	2/5/2015 1:14:16 PM	
1.22	3.76	15.95	2/5/2015 1:15:20 PM	
1.59	3.77	16.24	2/5/2015 1:16:25 PM	
1.10	3.76	15.92	2/5/2015 1:17:29 PM	
1.22	3.74	16.31	2/5/2015 1:18:34 PM	
1.83	3.73	16.21	2/5/2015 1:19:38 PM	
1.10	3.72	16.01	2/5/2015 1:20:43 PM	
1.10	3.72	16.09	2/5/2015 1:21:47 PM	
1.71	3.72	16.02	2/5/2015 1:22:52 PM	
2.44	3.72	15.99	2/5/2015 1:23:56 PM	
1.10	3.73	15.94	2/5/2015 1:25:01 PM	
1.10	3.73	16.01	2/5/2015 1:26:05 PM	
1.22	3.74	15.96	2/5/2015 1:27:10 PM	
1.10	3.74	16.01	2/5/2015 1:28:14 PM	
1.59	3.73	16.06	2/5/2015 1:29:19 PM	
1.10	3.72	16.03	2/5/2015 1:30:23 PM	
1.10	3.70	16.01	2/5/2015 1:31:28 PM	
1.22	3.72	15.84	2/5/2015 1:32:32 PM	
1.22	3.70	15.87	2/5/2015 1:33:37 PM	
1.10	3.70	15.99	2/5/2015 1:34:41 PM	
1.59	3.68	16.01	2/5/2015 1:35:46 PM	
1.10	3.67	16.03	2/5/2015 1:36:50 PM	
1.10	3.65	16.09	2/5/2015 1:37:55 PM	
1.22	3.64	16.16	2/5/2015 1:38:59 PM	
1.59	3.62	16.22	2/5/2015 1:40:04 PM	
1.22	3.61	16.27	2/5/2015 1:41:08 PM	
1.10	3.60	16.34	2/5/2015 1:42:13 PM	
1.10	3.59	16.38	2/5/2015 1:43:17 PM	
1.22	3.57	16.22	2/5/2015 1:44:22 PM	
1.22	3.56	16.20	2/5/2015 1:45:27 PM	
1.46	3.55	17.44	2/5/2015 1:46:31 PM	
3.05	3.54	15.52	2/5/2015 1:47:36 PM	
1.34	3.53	16.81	2/5/2015 1:48:40 PM	
1.46	3.52	16.24	2/5/2015 1:49:45 PM	
1.22	3.50	16.22	2/5/2015 1:50:49 PM	
0.24	3.50	16.32	2/5/2015 1:51:54 PM	
0.24	3.49	16.45	2/5/2015 1:52:58 PM	
0.12	3.50	16.31	2/5/2015 1:54:03 PM	
0.12	3.50	16.05	2/5/2015 1:55:07 PM	
0.12	3.49	16.07	2/5/2015 1:56:12 PM	

0.12	3.49	16.04	2/5/2015 1:57:16 PM	
0.12	3.48	16.09	2/5/2015 1:58:21 PM	
0.12	3.46	16.28	2/5/2015 1:59:25 PM	
0.24	3.45	16.31	2/5/2015 2:00:30 PM	
0.12	3.44	16.37	2/5/2015 2:01:34 PM	
0.12	3.43	16.01	2/5/2015 2:02:39 PM	
0.12	3.42	16.50	2/5/2015 2:03:43 PM	
0.12	3.41	17.13	2/5/2015 2:04:48 PM	
0.73	3.40	15.02	2/5/2015 2:05:52 PM	
0.12	3.40	15.87	2/5/2015 2:06:57 PM	
0.12	3.39	15.81	2/5/2015 2:08:01 PM	
0.12	3.38	15.97	2/5/2015 2:09:06 PM	
0.12	3.37	16.04	2/5/2015 2:10:10 PM	
0.12	3.36	16.21	2/5/2015 2:11:15 PM	
0.90	3.58	16.16		Avg 1
0.85	3.36	16.20	2/5/2015 2:12:19 PM	PortChange
0.61	3.36	19.86	2/5/2015 2:13:24 PM	
0.00	0.47	20.92	2/5/2015 2:14:28 PM	
0.00	0.47	20.94	2/5/2015 2:15:33 PM	
0.00	0.47	20.91	2/5/2015 2:16:37 PM	
0.37	0.47	20.90	2/5/2015 2:17:42 PM	
0.00	0.47	20.91	2/5/2015 2:18:47 PM	
0.12	0.47	17.63	2/5/2015 2:19:51 PM	
0.12	2.14	16.06	2/5/2015 2:20:56 PM	PortChange
0.12	3.30	16.32	2/5/2015 2:22:00 PM	
0.12	3.30	16.28	2/5/2015 2:23:05 PM	
0.12	3.30	16.18	2/5/2015 2:24:09 PM	
0.24	3.29	17.16	2/5/2015 2:25:14 PM	
0.24	3.27	16.01	2/5/2015 2:26:18 PM	
0.12	3.24	15.81	2/5/2015 2:27:23 PM	
0.12	3.19	16.17	2/5/2015 2:28:27 PM	
0.12	3.14	16.16	2/5/2015 2:29:32 PM	
0.49	3.09	16.19	2/5/2015 2:30:36 PM	
0.12	3.06	15.77	2/5/2015 2:31:41 PM	
0.12	3.02	15.64	2/5/2015 2:32:45 PM	
0.37	3.00	15.89	2/5/2015 2:33:50 PM	
0.12	2.98	15.92	2/5/2015 2:34:54 PM	
0.12	2.97	16.82	2/5/2015 2:35:59 PM	
0.12	2.96	15.65	2/5/2015 2:37:03 PM	
0.12	2.96	15.93	2/5/2015 2:38:08 PM	
0.12	2.96	17.23	2/5/2015 2:39:12 PM	
0.24	2.96	16.23	2/5/2015 2:40:17 PM	
0.00	2.97	15.71	2/5/2015 2:41:21 PM	
0.12	2.98	16.22	2/5/2015 2:42:26 PM	
0.12	2.99	15.64	2/5/2015 2:43:30 PM	
0.12	3.00	16.15	2/5/2015 2:44:35 PM	
0.12	3.02	16.28	2/5/2015 2:45:39 PM	
0.12	3.04	16.33	2/5/2015 2:46:44 PM	
0.12	3.05	16.22	2/5/2015 2:47:49 PM	
0.12	3.07	16.27	2/5/2015 2:48:53 PM	
0.12	3.08	17.71	2/5/2015 2:49:57 PM	
0.12	3.08	16.28	2/5/2015 2:51:02 PM	
0.12	3.09	15.30	2/5/2015 2:52:06 PM	
0.12	3.11	16.28	2/5/2015 2:53:11 PM	
0.12	3.12	16.39	2/5/2015 2:54:15 PM	
0.12	3.12	16.26	2/5/2015 2:55:20 PM	
0.12	3.13	16.30	2/5/2015 2:56:25 PM	
0.12	3.13	17.73	2/5/2015 2:57:29 PM	
0.12	3.14	16.51	2/5/2015 2:58:34 PM	
0.24	3.14	15.23	2/5/2015 2:59:38 PM	
0.12	3.14	16.20	2/5/2015 3:00:43 PM	

0.12	3.13	18.13	2/5/2015 3:01:47 PM	
0.12	3.13	16.18	2/5/2015 3:02:52 PM	
0.12	3.13	16.54	2/5/2015 3:03:56 PM	
0.12	3.13	17.31	2/5/2015 3:05:01 PM	
0.37	3.12	16.23	2/5/2015 3:06:05 PM	
0.12	3.12	16.10	2/5/2015 3:07:10 PM	
0.12	3.12	16.10	2/5/2015 3:08:14 PM	
0.12	3.11	16.07	2/5/2015 3:09:19 PM	
0.12	3.10	16.19	2/5/2015 3:10:23 PM	
0.49	3.09	16.23	2/5/2015 3:11:28 PM	
0.12	3.08	19.31	2/5/2015 3:12:32 PM	
0.61	3.07	17.91	2/5/2015 3:13:37 PM	
1.10	3.06	16.96	2/5/2015 3:14:41 PM	
0.12	3.05	15.75	2/5/2015 3:15:46 PM	
0.12	3.05	17.33	2/5/2015 3:16:50 PM	
0.12	3.05	16.35	2/5/2015 3:17:55 PM	
0.12	3.04	16.32	2/5/2015 3:18:59 PM	
0.12	3.03	17.24	2/5/2015 3:20:04 PM	
0.12	3.02	15.63	2/5/2015 3:21:09 PM	
0.24	3.00	17.45	2/5/2015 3:22:13 PM	StopRun2
0.18	3.09	16.42		Avg 2
0.54	3.33	16.29		Total Avg
0.24	2.98	16.48	2/5/2015 3:23:18 PM	
0.12	2.96	20.08	2/5/2015 3:24:22 PM	
0.12	2.95	20.93	2/5/2015 3:25:27 PM	
0.24	2.93	5.93	2/5/2015 3:26:31 PM	
7.57	2.09	0.28	2/5/2015 3:27:35 PM	
18.19	0.51	0.21	2/5/2015 3:28:40 PM	
26.39	0.51	0.18	2/5/2015 3:29:44 PM	
26.36	0.51	0.15	2/5/2015 3:30:49 PM	
26.31	0.51	0.14	2/5/2015 3:31:54 PM	
26.39	0.51	0.14	2/5/2015 3:32:58 PM	
26.40	0.51	0.14	2/5/2015 3:34:03 PM	
26.49	0.51	0.13	2/5/2015 3:35:07 PM	COBiasCO2,O2Zero
26.39	0.51	0.53	2/5/2015 3:36:12 PM	
24.29	2.11	9.63	2/5/2015 3:37:16 PM	
10.25	8.92	10.06	2/5/2015 3:38:21 PM	
1.71	9.97	10.26	2/5/2015 3:39:25 PM	
0.12	9.97	16.45	2/5/2015 3:40:30 PM	
0.12	9.91	15.77	2/5/2015 3:41:34 PM	
0.12	7.83	10.10	2/5/2015 3:42:39 PM	
0.12	8.92	10.10	2/5/2015 3:43:43 PM	
0.12	9.97	10.08	2/5/2015 3:44:48 PM	
0.12	10.00	10.06	2/5/2015 3:45:52 PM	CO2,O2BiasCOZero
0.12	9.96	19.57	2/5/2015 3:46:57 PM	
0.12	9.91	20.78	2/5/2015 3:48:01 PM	
0.12	0.85	20.86	2/5/2015 3:49:06 PM	
0.12	0.63	20.90	2/5/2015 3:50:10 PM	
0.12	0.63	20.91	2/5/2015 3:51:15 PM	
0.12	0.63	20.87	2/5/2015 3:52:19 PM	
0.24	0.63	20.89	2/5/2015 3:53:24 PM	
0.12	0.62	20.93	2/5/2015 3:54:28 PM	
0.12	0.57	20.95	2/5/2015 3:55:33 PM	
0.12	0.51	20.96	2/5/2015 3:56:38 PM	
0.12	0.51	20.95	2/5/2015 3:57:42 PM	
0.12	0.51	20.94	2/5/2015 3:58:47 PM	
0.12	0.51	20.95	2/5/2015 3:59:51 PM	
0.12	0.51	20.94	2/5/2015 4:00:56 PM	
0.12	0.51	20.94	2/5/2015 4:02:00 PM	
0.12	0.51	20.94	2/5/2015 4:03:04 PM	
0.12	0.51	20.94	2/5/2015 4:04:09 PM	

0.12	0.51	20.93	2/5/2015 4:05:13 PM	
0.12	0.51	20.94	2/5/2015 4:06:18 PM	
0.12	0.51	20.93	2/5/2015 4:07:23 PM	
0.12	0.51	15.39	2/5/2015 4:08:27 PM	
0.49	2.33	14.55	2/5/2015 4:09:32 PM	
1.22	5.19	14.59	2/5/2015 4:10:36 PM	
1.10	5.05	14.84	2/5/2015 4:11:41 PM	StartRun3
1.22	2.90	16.89	2/5/2015 4:12:45 PM	
3.05	3.75	16.19	2/5/2015 4:13:50 PM	
2.44	3.61	15.93	2/5/2015 4:14:54 PM	
1.83	3.49	15.91	2/5/2015 4:15:59 PM	
0.98	3.07	17.10	2/5/2015 4:17:03 PM	
1.95	3.93	16.14	2/5/2015 4:18:08 PM	
1.71	4.22	16.00	2/5/2015 4:19:12 PM	
2.07	4.26	15.99	2/5/2015 4:20:17 PM	
1.83	4.19	16.00	2/5/2015 4:21:21 PM	
1.71	3.84	16.32	2/5/2015 4:22:26 PM	
1.10	3.44	16.62	2/5/2015 4:23:30 PM	
1.34	3.56	16.25	2/5/2015 4:24:35 PM	
1.71	3.53	16.38	2/5/2015 4:25:39 PM	
1.95	3.66	16.17	2/5/2015 4:26:44 PM	
2.07	3.65	16.17	2/5/2015 4:27:49 PM	
2.07	3.65	16.17	2/5/2015 4:28:53 PM	
2.07	3.65	16.17	2/5/2015 4:29:57 PM	
2.20	3.55	16.33	2/5/2015 4:31:02 PM	
2.07	3.51	16.38	2/5/2015 4:32:07 PM	
2.07	3.75	16.04	2/5/2015 4:33:11 PM	
1.95	3.84	15.91	2/5/2015 4:34:16 PM	
0.98	3.64	16.19	2/5/2015 4:35:20 PM	
0.98	3.59	16.24	2/5/2015 4:36:25 PM	
0.98	3.55	16.30	2/5/2015 4:37:29 PM	
3.29	3.25	17.01	2/5/2015 4:38:34 PM	
1.95	4.02	15.46	2/5/2015 4:39:38 PM	
1.34	3.59	16.17	2/5/2015 4:40:42 PM	
0.24	3.49	16.31	2/5/2015 4:41:47 PM	
0.00	3.50	16.27	2/5/2015 4:42:52 PM	
0.00	3.52	16.22	2/5/2015 4:43:56 PM	
0.00	3.48	16.28	2/5/2015 4:45:01 PM	
0.00	3.47	16.36	2/5/2015 4:46:05 PM	
0.00	2.63	17.93	2/5/2015 4:47:10 PM	
0.73	3.71	15.77	2/5/2015 4:48:14 PM	
0.37	3.55	16.14	2/5/2015 4:49:19 PM	
0.12	3.66	15.99	2/5/2015 4:50:23 PM	
0.12	3.55	16.16	2/5/2015 4:51:28 PM	
0.00	3.52	16.21	2/5/2015 4:52:32 PM	
0.12	3.48	16.27	2/5/2015 4:53:37 PM	
0.00	3.40	16.38	2/5/2015 4:54:41 PM	
0.00	3.39	16.46	2/5/2015 4:55:46 PM	
0.12	3.15	17.12	2/5/2015 4:56:50 PM	
0.00	4.64	14.42	2/5/2015 4:57:55 PM	
0.00	3.51	16.17	2/5/2015 4:58:59 PM	
0.00	3.41	16.26	2/5/2015 5:00:04 PM	
0.00	3.75	15.72	2/5/2015 5:01:08 PM	
0.00	3.90	15.50	2/5/2015 5:02:13 PM	
0.00	2.73	17.87	2/5/2015 5:03:17 PM	
0.00	4.01	15.37	2/5/2015 5:04:22 PM	
0.00	4.14	15.12	2/5/2015 5:05:26 PM	
0.00	3.96	15.39	2/5/2015 5:06:31 PM	
0.12	3.95	15.38	2/5/2015 5:07:36 PM	
0.00	3.82	15.61	2/5/2015 5:08:40 PM	
0.00	3.66	15.84	2/5/2015 5:09:45 PM	
0.24	3.63	15.87	2/5/2015 5:10:49 PM	

0.00	3.62	15.86	2/5/2015 5:11:54 PM	
0.92	3.65	16.13		Avg 1
0.12	3.61	15.92	2/5/2015 5:12:58 PM	PortChange
0.00	2.08	18.46	2/5/2015 5:14:03 PM	
0.00	0.46	21.08	2/5/2015 5:15:07 PM	
0.00	0.47	21.09	2/5/2015 5:16:12 PM	
0.61	3.19	16.47	2/5/2015 5:17:16 PM	
0.12	2.03	18.40	2/5/2015 5:18:21 PM	
0.12	3.54	15.98	2/5/2015 5:19:25 PM	PortChange
0.12	3.84	15.51	2/5/2015 5:20:30 PM	
0.12	3.81	15.56	2/5/2015 5:21:34 PM	
0.00	3.77	15.61	2/5/2015 5:22:39 PM	
0.00	3.77	15.61	2/5/2015 5:23:43 PM	
0.00	3.75	15.63	2/5/2015 5:24:48 PM	
0.00	3.71	15.69	2/5/2015 5:25:52 PM	
0.00	3.71	15.69	2/5/2015 5:26:57 PM	
0.00	3.06	16.99	2/5/2015 5:28:01 PM	
0.24	2.11	18.87	2/5/2015 5:29:06 PM	
0.12	2.14	18.82	2/5/2015 5:30:10 PM	
0.12	3.94	15.50	2/5/2015 5:31:15 PM	
0.12	4.44	14.90	2/5/2015 5:32:19 PM	
0.12	3.01	17.06	2/5/2015 5:33:24 PM	
0.12	3.73	15.59	2/5/2015 5:34:28 PM	
0.12	2.42	18.18	2/5/2015 5:35:33 PM	
0.12	2.63	17.63	2/5/2015 5:36:37 PM	
0.12	4.25	14.71	2/5/2015 5:37:42 PM	
0.12	4.18	15.09	2/5/2015 5:39:07 PM	
0.12	2.97	16.92	2/5/2015 5:39:51 PM	
0.37	3.48	15.95	2/5/2015 5:40:55 PM	
0.00	3.43	15.99	2/5/2015 5:42:00 PM	
0.12	3.22	16.55	2/5/2015 5:43:05 PM	
0.12	4.11	15.11	2/5/2015 5:44:09 PM	
0.12	3.95	15.07	2/5/2015 5:45:14 PM	
0.12	2.59	17.48	2/5/2015 5:46:18 PM	
0.12	2.65	17.32	2/5/2015 5:47:23 PM	
0.24	2.94	16.84	2/5/2015 5:48:27 PM	
0.12	3.62	15.48	2/5/2015 5:49:32 PM	
0.00	3.28	16.06	2/5/2015 5:50:36 PM	
0.12	2.42	17.73	2/5/2015 5:51:41 PM	
0.12	3.19	16.17	2/5/2015 5:52:45 PM	
0.12	2.50	17.57	2/5/2015 5:53:50 PM	
0.12	3.41	15.73	2/5/2015 5:54:54 PM	
0.00	3.23	16.05	2/5/2015 5:55:59 PM	
0.00	3.18	16.10	2/5/2015 5:57:03 PM	
0.12	3.16	16.14	2/5/2015 5:58:08 PM	
0.12	2.72	17.00	2/5/2015 5:59:12 PM	
0.49	2.57	17.21	2/5/2015 6:00:17 PM	
0.12	3.36	15.73	2/5/2015 6:01:21 PM	
0.12	3.05	16.28	2/5/2015 6:02:26 PM	
0.12	3.01	16.35	2/5/2015 6:03:30 PM	
0.12	3.02	16.31	2/5/2015 6:04:35 PM	
0.12	3.01	16.33	2/5/2015 6:05:39 PM	
0.00	2.32	17.69	2/5/2015 6:06:44 PM	
0.00	2.80	16.71	2/5/2015 6:07:48 PM	
0.37	3.27	15.82	2/5/2015 6:08:53 PM	
0.00	2.61	17.14	2/5/2015 6:09:57 PM	
0.12	2.43	17.46	2/5/2015 6:11:02 PM	
0.00	2.50	17.30	2/5/2015 6:12:06 PM	
0.12	2.32	17.59	2/5/2015 6:13:11 PM	
0.00	0.59	20.45	2/5/2015 6:14:15 PM	
0.24	2.77	16.76	2/5/2015 6:15:20 PM	

0.49	2.94	16.45	2/5/2015 6:16:24 PM	
0.00	2.55	17.21	2/5/2015 6:17:29 PM	
0.12	3.39	15.59	2/5/2015 6:18:34 PM	
0.00	2.31	17.64	2/5/2015 6:19:38 PM	
0.37	2.31	17.55	2/5/2015 6:20:43 PM	StopRun3
0.12	3.08	16.55		Avg 2
0.52	3.36	16.34		Total Avg
0.12	0.47	21.05	2/5/2015 6:21:47 PM	
0.12	0.47	21.06	2/5/2015 6:22:52 PM	
0.12	0.47	21.06	2/5/2015 6:23:56 PM	
0.12	0.47	21.07	2/5/2015 6:25:01 PM	
0.37	0.47	21.07	2/5/2015 6:26:05 PM	
0.12	0.46	21.07	2/5/2015 6:27:10 PM	
0.12	0.47	21.07	2/5/2015 6:28:14 PM	
0.12	0.47	20.94	2/5/2015 6:29:19 PM	
0.12	0.47	20.95	2/5/2015 6:30:23 PM	
0.12	0.47	21.04	2/5/2015 6:31:28 PM	
0.12	0.47	21.04	2/5/2015 6:32:32 PM	
0.12	0.47	20.93	2/5/2015 6:33:37 PM	
0.12	0.47	20.91	2/5/2015 6:34:41 PM	
0.12	0.47	20.86	2/5/2015 6:35:46 PM	
0.12	0.47	20.87	2/5/2015 6:36:50 PM	
0.12	0.46	21.05	2/5/2015 6:37:55 PM	
0.12	0.47	21.05	2/5/2015 6:38:59 PM	
0.12	0.47	21.06	2/5/2015 6:40:04 PM	
0.12	0.46	21.06	2/5/2015 6:41:08 PM	
0.12	0.47	21.07	2/5/2015 6:42:13 PM	
0.12	0.46	21.07	2/5/2015 6:43:17 PM	
0.12	0.47	21.08	2/5/2015 6:44:22 PM	
0.12	0.46	21.08	2/5/2015 6:45:26 PM	
0.12	0.47	21.05	2/5/2015 6:46:31 PM	
0.12	0.47	20.97	2/5/2015 6:47:35 PM	
0.12	0.47	21.09	2/5/2015 6:48:40 PM	
0.12	0.47	21.09	2/5/2015 6:49:44 PM	
0.12	0.47	20.99	2/5/2015 6:50:52 PM	
0.37	0.47	21.00	2/5/2015 6:51:53 PM	
0.37	0.47	21.03	2/5/2015 6:52:58 PM	
0.12	0.46	21.14	2/5/2015 6:54:03 PM	
0.12	0.47	21.14	2/5/2015 6:55:07 PM	
0.12	0.46	21.14	2/5/2015 6:56:12 PM	
0.12	0.47	21.14	2/5/2015 6:57:16 PM	
0.12	0.46	21.15	2/5/2015 6:58:21 PM	
0.37	0.46	21.15	2/5/2015 6:59:25 PM	
0.49	0.47	21.15	2/5/2015 7:00:30 PM	
0.12	0.47	21.15	2/5/2015 7:01:34 PM	
0.12	0.47	21.15	2/5/2015 7:02:39 PM	
0.12	0.47	21.15	2/5/2015 7:03:43 PM	
0.12	0.47	21.15	2/5/2015 7:04:48 PM	
0.12	2.67	15.99	2/5/2015 7:05:52 PM	
5.25	0.95	1.86	2/5/2015 7:06:57 PM	
25.63	0.47	0.02	2/5/2015 7:08:01 PM	
27.10	0.46	0.02	2/5/2015 7:09:06 PM	COBiasCO2,O2Zero
27.06	4.77	5.10	2/5/2015 7:10:10 PM	
20.63	10.08	10.14	2/5/2015 7:11:15 PM	
4.88	10.13	10.12	2/5/2015 7:12:19 PM	
0.73	10.14	10.11	2/5/2015 7:13:24 PM	
0.12	10.15	10.11	2/5/2015 7:14:28 PM	COBiasCO2,O2Zero
0.12	10.13	12.45	2/5/2015 7:15:33 PM	
0.14	10.07	20.72	2/5/2015 7:16:37 PM	
0.09	8.28	20.79	2/5/2015 7:17:42 PM	
0.12	0.47	21.07	2/5/2015 7:18:46 PM	

0.12	0.47	21.09	2/5/2015 7:19:51 PM	
0.12	0.46	21.09	2/5/2015 7:20:55 PM	
0.12	0.47	21.10	2/5/2015 7:22:00 PM	
0.12	0.46	21.10	2/5/2015 7:23:04 PM	
0.12	0.47	21.10	2/5/2015 7:24:09 PM	
0.12	0.46	21.10	2/5/2015 7:25:13 PM	
0.12	0.47	21.09	2/5/2015 7:26:18 PM	
0.12	0.46	21.09	2/5/2015 7:27:22 PM	
0.12	0.46	21.09	2/5/2015 7:28:27 PM	
0.12	0.47	21.10	2/5/2015 7:29:32 PM	
0.37	1.85	18.31	2/5/2015 7:30:36 PM	
0.12	2.48	17.13	2/5/2015 7:31:41 PM	
0.12	3.56	15.06	2/5/2015 7:32:45 PM	
0.49	3.62	15.01	2/5/2015 7:33:50 PM	
0.12	3.05	17.10	2/5/2015 7:34:54 PM	StartRun4
1.22	3.19	16.75	2/5/2015 7:35:59 PM	
1.34	3.48	16.27	2/5/2015 7:37:03 PM	
0.73	3.63	16.07	2/5/2015 7:38:08 PM	
0.73	3.86	15.79	2/5/2015 7:39:12 PM	
1.10	3.93	15.80	2/5/2015 7:40:17 PM	
1.10	3.88	15.84	2/5/2015 7:41:21 PM	
1.10	3.87	15.92	2/5/2015 7:42:26 PM	
1.10	3.91	15.75	2/5/2015 7:43:30 PM	
1.10	3.89	15.93	2/5/2015 7:44:35 PM	
1.10	3.96	15.73	2/5/2015 7:45:39 PM	
1.10	3.94	15.86	2/5/2015 7:46:44 PM	
1.10	3.95	15.85	2/5/2015 7:47:48 PM	
0.98	3.92	15.90	2/5/2015 7:48:53 PM	
0.73	3.89	15.92	2/5/2015 7:49:57 PM	
0.12	3.87	15.93	2/5/2015 7:51:02 PM	
0.73	3.83	15.97	2/5/2015 7:52:06 PM	
0.12	3.88	15.92	2/5/2015 7:53:11 PM	
0.12	3.77	16.07	2/5/2015 7:54:15 PM	
0.12	3.78	16.04	2/5/2015 7:55:20 PM	
0.12	3.83	15.96	2/5/2015 7:56:24 PM	
0.12	3.74	16.07	2/5/2015 7:57:29 PM	
0.12	3.65	16.21	2/5/2015 7:58:33 PM	
0.12	3.40	16.73	2/5/2015 7:59:38 PM	
0.49	3.52	16.35	2/5/2015 8:00:42 PM	
1.46	3.54	16.33	2/5/2015 8:01:47 PM	
0.61	3.68	16.13	2/5/2015 8:02:52 PM	
0.12	3.69	16.13	2/5/2015 8:03:56 PM	
0.12	3.60	16.24	2/5/2015 8:05:01 PM	
0.12	3.73	16.08	2/5/2015 8:06:05 PM	
0.12	3.49	16.39	2/5/2015 8:07:10 PM	
0.12	3.51	16.34	2/5/2015 8:08:14 PM	
0.12	3.51	16.46	2/5/2015 8:09:19 PM	
0.12	3.41	16.70	2/5/2015 8:10:23 PM	
1.10	3.80	15.93	2/5/2015 8:11:28 PM	
0.73	3.54	16.30	2/5/2015 8:12:32 PM	
0.12	3.52	16.32	2/5/2015 8:13:37 PM	
0.12	3.52	16.31	2/5/2015 8:14:41 PM	
0.12	3.52	16.32	2/5/2015 8:15:46 PM	
0.12	3.59	16.21	2/5/2015 8:16:50 PM	
0.12	3.38	16.85	2/5/2015 8:17:55 PM	
0.24	3.75	16.15	2/5/2015 8:18:59 PM	
0.98	3.79	15.95	2/5/2015 8:20:04 PM	
0.12	3.70	16.06	2/5/2015 8:21:08 PM	
0.12	3.70	16.07	2/5/2015 8:22:13 PM	
0.12	3.61	16.20	2/5/2015 8:23:17 PM	
0.12	3.58	16.24	2/5/2015 8:24:22 PM	
0.12	3.51	16.34	2/5/2015 8:25:26 PM	

0.12	3.50	16.35	2/5/2015 8:26:31 PM	
4.03	3.59	16.20	2/5/2015 8:27:35 PM	
0.12	3.71	16.07	2/5/2015 8:28:40 PM	
0.12	3.64	16.16	2/5/2015 8:29:45 PM	
0.12	3.26	17.00	2/5/2015 8:30:49 PM	
0.12	3.60	16.30	2/5/2015 8:31:53 PM	
0.12	3.75	16.03	2/5/2015 8:33:00 PM	
0.12	3.78	15.98	2/5/2015 8:34:02 PM	
1.03	3.66	16.18		Avg 1
0.12	3.77	16.02	2/5/2015 8:35:07 PM	PortChange
0.12	3.81	16.04	2/5/2015 8:36:12 PM	
0.12	0.48	21.05	2/5/2015 8:37:16 PM	
0.12	0.47	21.11	2/5/2015 8:38:21 PM	
0.24	0.47	21.12	2/5/2015 8:39:25 PM	
0.12	2.99	17.12	2/5/2015 8:40:30 PM	
0.12	3.18	16.90	2/5/2015 8:41:34 PM	
0.12	3.01	17.13	2/5/2015 8:42:39 PM	PortChange
0.12	3.44	16.49	2/5/2015 8:43:43 PM	
0.12	3.37	16.58	2/5/2015 8:44:48 PM	
0.12	3.39	16.55	2/5/2015 8:46:06 PM	
0.12	3.59	16.24	2/5/2015 8:46:57 PM	
0.12	3.55	16.28	2/5/2015 8:48:01 PM	
0.12	3.45	16.41	2/5/2015 8:49:06 PM	
0.12	3.41	16.47	2/5/2015 8:50:10 PM	
0.12	3.54	16.26	2/5/2015 8:51:15 PM	
0.12	3.57	16.21	2/5/2015 8:52:19 PM	
0.12	3.51	16.28	2/5/2015 8:53:24 PM	
0.12	3.47	16.35	2/5/2015 8:54:28 PM	
0.12	3.37	16.50	2/5/2015 8:55:33 PM	
0.12	3.47	16.30	2/5/2015 8:56:37 PM	
0.12	3.46	16.31	2/5/2015 8:57:42 PM	
0.12	3.44	16.32	2/5/2015 8:58:46 PM	
0.12	3.37	16.41	2/5/2015 8:59:51 PM	
0.12	3.26	16.57	2/5/2015 9:00:55 PM	
0.12	3.15	16.75	2/5/2015 9:02:00 PM	
0.12	2.87	17.33	2/5/2015 9:03:04 PM	
0.12	2.26	18.66	2/5/2015 9:04:09 PM	
0.12	3.03	17.15	2/5/2015 9:05:13 PM	
0.12	3.42	16.46	2/5/2015 9:06:18 PM	
0.12	2.72	17.72	2/5/2015 9:07:22 PM	
0.12	3.70	15.84	2/5/2015 9:08:27 PM	
0.12	2.91	17.07	2/5/2015 9:09:31 PM	
0.12	2.44	18.11	2/5/2015 9:10:36 PM	
0.12	3.70	15.88	2/5/2015 9:11:41 PM	
0.12	3.47	16.17	2/5/2015 9:12:45 PM	
0.12	3.16	16.81	2/5/2015 9:13:50 PM	
0.12	2.62	17.79	2/5/2015 9:14:54 PM	
0.12	3.59	15.91	2/5/2015 9:15:59 PM	
0.12	3.36	16.29	2/5/2015 9:17:03 PM	
0.12	2.94	17.15	2/5/2015 9:18:08 PM	
0.12	3.27	16.49	2/5/2015 9:19:12 PM	
0.12	2.70	17.55	2/5/2015 9:20:17 PM	
0.12	3.48	15.95	2/5/2015 9:21:21 PM	
0.12	3.20	16.59	2/5/2015 9:22:26 PM	
0.12	2.17	18.62	2/5/2015 9:23:30 PM	
0.12	3.44	15.92	2/5/2015 9:24:35 PM	
0.12	3.39	16.07	2/5/2015 9:25:39 PM	
0.12	2.54	17.60	2/5/2015 9:26:44 PM	
0.12	2.82	17.05	2/5/2015 9:27:48 PM	
0.12	2.83	17.10	2/5/2015 9:28:53 PM	
0.12	3.18	16.32	2/5/2015 9:29:57 PM	

0.12	2.26	17.98	2/5/2015 9:31:02 PM	
0.12	2.48	17.51	2/5/2015 9:32:06 PM	
0.12	3.51	15.65	2/5/2015 9:33:11 PM	
0.12	2.79	17.07	2/5/2015 9:34:15 PM	
0.12	1.76	18.69	2/5/2015 9:35:20 PM	
0.12	2.00	18.14	2/5/2015 9:36:24 PM	
0.12	2.38	17.74	2/5/2015 9:37:29 PM	
0.12	1.51	18.73	2/5/2015 9:38:33 PM	
0.24	3.13	16.28	2/5/2015 9:39:38 PM	
0.12	2.36	17.75	2/5/2015 9:40:42 PM	
0.12	3.19	16.08	2/5/2015 9:41:47 PM	
0.12	2.68	17.13	2/5/2015 9:42:51 PM	
0.24	2.53	17.30	2/5/2015 9:43:56 PM	StopRun4
0.13	3.05	16.86		Avg 2
0.58	3.35	16.52		Total Avg
0.12	1.26	19.69	2/5/2015 9:45:00 PM	
0.12	0.47	21.13	2/5/2015 9:46:05 PM	
0.12	0.47	21.14	2/5/2015 9:47:10 PM	
0.12	0.46	21.14	2/5/2015 9:48:14 PM	
0.12	0.47	21.14	2/5/2015 9:49:19 PM	
0.12	0.46	21.14	2/5/2015 9:50:23 PM	
0.12	0.47	21.13	2/5/2015 9:51:28 PM	
0.12	0.46	21.08	2/5/2015 9:52:32 PM	
0.24	0.47	7.59	2/5/2015 9:53:37 PM	
10.99	0.47	0.00	2/5/2015 9:54:41 PM	
24.90	0.46	0.00	2/5/2015 9:55:46 PM	
27.06	0.47	0.00	2/5/2015 9:56:50 PM	COBiasCO2,O2Zero
27.02	4.99	7.17	2/5/2015 9:57:55 PM	
17.82	10.14	10.12	2/5/2015 9:58:59 PM	
3.78	10.16	10.12	2/5/2015 10:00:04 PM	
0.61	10.17	10.12	2/5/2015 10:01:08 PM	
0.12	10.17	10.12	2/5/2015 10:02:13 PM	CO2,O2BiasCOZero
0.12	4.79	8.65	2/5/2015 10:03:17 PM	
0.12	1.71	-0.13	2/5/2015 10:04:22 PM	

Swan Point Cemetery
FTC Model FT III Human Crematory Outlet

O2	Cal	Monitor
High	22.41	22.4
Low	10.1	10.1
Zero	0	0.1

CO2	Cal	Monitor
High	21.79	21.8
Low	9.9	9.8
Zero	0	0.3

CO	Cal	Monitor
High	49.96	50
Low	25.88	26
Zero	0	0.1

CO	CO2	O2		
26.12	0.47	0.18	2/6/2015 10:37:03 AM	COBiasCO2,O2Zero
26.12	0.73	1.48	2/6/2015 10:38:07 AM	
24.78	9.45	10.06	2/6/2015 10:39:12 AM	
9.76	9.73	10.11	2/6/2015 10:40:16 AM	
1.71	9.77	10.13	2/6/2015 10:41:21 AM	
0.24	9.79	10.14	2/6/2015 10:42:25 AM	
0.24	9.80	10.15	2/6/2015 10:43:30 AM	CO2,O2BiasCOZero
0.24	8.32	12.48	2/6/2015 10:44:34 AM	
0.12	0.46	20.93	2/6/2015 10:45:39 AM	
0.00	0.47	20.98	2/6/2015 10:46:43 AM	
-0.25	0.46	21.00	2/6/2015 10:47:48 AM	
-0.73	0.47	21.01	2/6/2015 10:48:52 AM	
-0.73	0.47	21.02	2/6/2015 10:49:57 AM	
-0.73	0.46	21.02	2/6/2015 10:51:02 AM	
-0.61	0.46	21.02	2/6/2015 10:52:06 AM	
-0.12	0.47	21.02	2/6/2015 10:53:11 AM	
0.12	0.47	21.02	2/6/2015 10:54:15 AM	
0.12	0.47	21.02	2/6/2015 10:55:20 AM	
0.12	0.46	21.03	2/6/2015 10:56:24 AM	
0.12	0.47	21.03	2/6/2015 10:57:29 AM	
0.12	0.47	21.04	2/6/2015 10:58:33 AM	
0.12	0.46	21.04	2/6/2015 10:59:38 AM	
0.12	0.46	21.04	2/6/2015 11:00:42 AM	
0.12	0.47	21.04	2/6/2015 11:01:47 AM	
0.12	0.47	21.04	2/6/2015 11:02:51 AM	
0.12	0.47	21.04	2/6/2015 11:03:56 AM	
0.12	0.47	21.04	2/6/2015 11:05:00 AM	
0.12	0.47	21.04	2/6/2015 11:06:05 AM	
0.12	1.15	19.39	2/6/2015 11:07:09 AM	
0.98	3.34	15.59	2/6/2015 11:08:14 AM	
0.12	3.13	16.01	2/6/2015 11:09:18 AM	
0.12	2.95	16.46	2/6/2015 11:10:23 AM	
0.24	2.32	17.69	2/6/2015 11:11:27 AM	
0.24	2.32	17.57	2/6/2015 11:12:32 AM	
0.12	2.52	17.70	2/6/2015 11:13:36 AM	StartRun1
20.51	3.62	16.93	2/6/2015 11:14:41 AM	
26.98	3.24	17.12	2/6/2015 11:15:45 AM	
6.96	3.30	17.27	2/6/2015 11:16:50 AM	
3.17	3.42	17.04	2/6/2015 11:17:54 AM	
4.03	3.33	17.36	2/6/2015 11:18:59 AM	
4.64	4.16	16.49	2/6/2015 11:20:03 AM	
4.15	3.64	17.46	2/6/2015 11:21:08 AM	
5.13	3.95	16.46	2/6/2015 11:22:12 AM	
3.78	3.84	16.78	2/6/2015 11:23:17 AM	
2.20	3.93	16.71	2/6/2015 11:24:21 AM	
2.20	3.79	16.85	2/6/2015 11:25:26 AM	
1.95	3.41	17.28	2/6/2015 11:26:31 AM	
1.59	2.97	17.74	2/6/2015 11:27:35 AM	

2.20	2.87	17.54	2/6/2015 11:28:40 AM	
1.83	2.73	17.75	2/6/2015 11:29:44 AM	
1.22	2.76	17.56	2/6/2015 11:30:49 AM	
1.22	2.69	17.57	2/6/2015 11:31:53 AM	
0.24	2.72	17.42	2/6/2015 11:32:58 AM	
0.12	3.04	16.90	2/6/2015 11:34:02 AM	
0.12	3.02	16.89	2/6/2015 11:35:07 AM	
0.24	2.98	16.96	2/6/2015 11:36:11 AM	
0.24	3.19	16.61	2/6/2015 11:37:16 AM	
0.12	3.23	16.54	2/6/2015 11:38:20 AM	
0.24	3.23	16.59	2/6/2015 11:39:25 AM	
0.24	3.18	16.67	2/6/2015 11:40:29 AM	
0.24	3.16	16.73	2/6/2015 11:41:34 AM	
0.49	3.16	16.75	2/6/2015 11:42:38 AM	
0.12	3.12	16.82	2/6/2015 11:43:43 AM	
0.24	3.10	16.85	2/6/2015 11:44:47 AM	
0.24	3.10	16.87	2/6/2015 11:45:52 AM	
0.24	3.07	16.92	2/6/2015 11:46:56 AM	
0.24	3.07	16.93	2/6/2015 11:48:01 AM	
0.24	3.05	16.95	2/6/2015 11:49:05 AM	
0.12	3.14	16.86	2/6/2015 11:50:10 AM	
0.12	3.15	16.85	2/6/2015 11:51:14 AM	
0.49	3.11	16.92	2/6/2015 11:52:19 AM	
0.24	3.16	16.84	2/6/2015 11:53:24 AM	
0.24	3.17	16.83	2/6/2015 11:54:28 AM	
0.24	3.17	16.80	2/6/2015 11:55:32 AM	
0.24	3.21	16.77	2/6/2015 11:56:37 AM	
0.12	3.17	16.83	2/6/2015 11:57:41 AM	
0.12	3.17	16.85	2/6/2015 11:58:46 AM	
0.24	3.16	16.85	2/6/2015 11:59:50 AM	
0.24	3.15	16.89	2/6/2015 12:00:55 PM	
0.49	3.12	16.90	2/6/2015 12:02:00 PM	
0.12	2.98	17.20	2/6/2015 12:03:04 PM	
0.24	3.09	16.89	2/6/2015 12:04:09 PM	
0.24	3.02	17.26	2/6/2015 12:05:13 PM	
0.24	2.56	17.96	2/6/2015 12:06:18 PM	
0.24	3.91	15.56	2/6/2015 12:07:22 PM	
0.24	3.29	16.65	2/6/2015 12:08:27 PM	
0.24	3.30	16.59	2/6/2015 12:09:31 PM	
0.24	3.25	16.68	2/6/2015 12:10:36 PM	
0.24	3.18	16.79	2/6/2015 12:11:40 PM	
0.24	3.23	16.68	2/6/2015 12:12:45 PM	
0.49	3.22	16.71	2/6/2015 12:13:49 PM	
1.81	3.20	16.95		Avg 1
0.24	3.14	17.12	2/6/2015 12:14:54 PM	PortChange
0.12	0.48	20.93	2/6/2015 12:15:58 PM	
0.12	0.47	20.95	2/6/2015 12:17:03 PM	
-0.12	0.47	20.97	2/6/2015 12:18:07 PM	
-0.86	0.47	20.97	2/6/2015 12:19:12 PM	
-0.49	0.47	20.98	2/6/2015 12:20:16 PM	
-0.73	0.46	20.86	2/6/2015 12:21:21 PM	
-0.86	3.01	16.83	2/6/2015 12:22:25 PM	
0.12	3.14	16.81	2/6/2015 12:23:30 PM	PortChange
0.24	3.18	16.66	2/6/2015 12:24:34 PM	
0.24	3.57	15.95	2/6/2015 12:25:39 PM	
0.24	3.23	16.55	2/6/2015 12:26:43 PM	
0.24	2.71	17.50	2/6/2015 12:27:48 PM	
0.24	2.77	17.42	2/6/2015 12:28:53 PM	
0.24	2.99	16.88	2/6/2015 12:29:57 PM	
0.24	3.79	15.50	2/6/2015 12:31:01 PM	
0.24	3.45	16.12	2/6/2015 12:32:06 PM	

0.24	2.75	17.43	2/6/2015 12:33:10 PM	
0.24	2.70	17.53	2/6/2015 12:34:15 PM	
0.24	2.99	16.79	2/6/2015 12:35:19 PM	
0.24	3.43	16.33	2/6/2015 12:36:24 PM	
0.24	2.44	18.12	2/6/2015 12:37:29 PM	
0.24	3.16	16.65	2/6/2015 12:38:33 PM	
0.24	2.55	18.00	2/6/2015 12:39:38 PM	
0.24	3.09	16.53	2/6/2015 12:40:42 PM	
0.24	3.84	15.43	2/6/2015 12:41:47 PM	
0.24	3.28	16.47	2/6/2015 12:42:51 PM	
0.24	2.43	17.98	2/6/2015 12:43:56 PM	
0.24	2.83	17.01	2/6/2015 12:45:00 PM	
0.24	3.42	16.07	2/6/2015 12:46:05 PM	
0.24	3.20	16.45	2/6/2015 12:47:09 PM	
0.24	2.99	16.82	2/6/2015 12:48:14 PM	
0.24	2.92	16.93	2/6/2015 12:49:18 PM	
0.24	2.97	16.82	2/6/2015 12:50:23 PM	
0.24	3.05	16.68	2/6/2015 12:51:27 PM	
0.24	3.01	16.78	2/6/2015 12:52:32 PM	
0.24	2.90	16.94	2/6/2015 12:53:36 PM	
0.24	2.94	16.84	2/6/2015 12:54:41 PM	
0.24	2.98	16.76	2/6/2015 12:55:45 PM	
0.24	2.97	16.77	2/6/2015 12:56:50 PM	
0.24	2.96	16.78	2/6/2015 12:57:54 PM	
0.00	2.94	16.81	2/6/2015 12:58:59 PM	
-0.12	2.92	16.85	2/6/2015 1:00:03 PM	
-0.12	2.91	16.87	2/6/2015 1:01:08 PM	
0.00	2.90	16.86	2/6/2015 1:02:12 PM	
0.49	2.66	17.49	2/6/2015 1:03:17 PM	
-0.12	2.33	17.95	2/6/2015 1:04:22 PM	
0.12	3.13	16.37	2/6/2015 1:05:26 PM	
0.00	2.88	17.10	2/6/2015 1:06:30 PM	
-0.25	2.46	17.63	2/6/2015 1:07:35 PM	
0.00	3.18	16.35	2/6/2015 1:08:39 PM	
-0.25	2.93	16.77	2/6/2015 1:09:44 PM	
0.00	2.91	16.79	2/6/2015 1:10:48 PM	
-0.25	2.94	16.71	2/6/2015 1:11:53 PM	
-0.49	2.41	17.95	2/6/2015 1:12:58 PM	
0.00	2.21	18.19	2/6/2015 1:14:02 PM	
0.00	2.34	17.87	2/6/2015 1:15:07 PM	
-0.12	1.89	18.72	2/6/2015 1:16:11 PM	
-0.12	1.84	18.03	2/6/2015 1:17:16 PM	
0.24	3.86	15.01	2/6/2015 1:18:20 PM	
0.24	2.13	18.56	2/6/2015 1:19:25 PM	
0.00	2.76	16.79	2/6/2015 1:20:29 PM	
0.00	2.72	17.21	2/6/2015 1:21:34 PM	
-0.49	2.44	17.78	2/6/2015 1:22:38 PM	
-0.25	1.19	19.49	2/6/2015 1:23:43 PM	
0.37	3.00	16.32	2/6/2015 1:24:47 PM	StopRun1
0.12	2.87	17.02		Avg 2
0.96	3.03	16.98		Total Avg
0.24	2.99	16.83	2/6/2015 1:25:52 PM	
-0.12	0.49	20.90	2/6/2015 1:26:56 PM	
-0.12	0.47	20.97	2/6/2015 1:28:01 PM	
-0.49	0.47	20.97	2/6/2015 1:29:05 PM	
-0.37	0.47	20.97	2/6/2015 1:30:10 PM	
0.12	0.47	20.97	2/6/2015 1:31:14 PM	
0.12	0.47	20.97	2/6/2015 1:32:19 PM	
-0.37	0.47	20.98	2/6/2015 1:33:23 PM	
0.12	0.47	20.98	2/6/2015 1:34:28 PM	
0.12	0.47	20.98	2/6/2015 1:35:32 PM	

0.12	0.46	20.99	2/6/2015 1:36:37 PM	
0.12	0.47	20.99	2/6/2015 1:37:42 PM	
0.12	0.84	17.87	2/6/2015 1:38:46 PM	
1.59	0.51	0.49	2/6/2015 1:39:51 PM	
16.23	0.47	0.30	2/6/2015 1:40:55 PM	
23.92	0.47	0.20	2/6/2015 1:41:59 PM	
25.76	0.47	0.15	2/6/2015 1:43:04 PM	
26.85	0.47	0.13	2/6/2015 1:44:08 PM	COBiasCO2,O2Zero
26.49	1.78	3.56	2/6/2015 1:45:13 PM	
22.70	9.67	10.10	2/6/2015 1:46:19 PM	
6.71	9.75	10.10	2/6/2015 1:47:22 PM	
1.71	9.77	10.11	2/6/2015 1:48:27 PM	
0.24	9.78	10.11	2/6/2015 1:49:31 PM	
0.49	9.79	10.10	2/6/2015 1:50:36 PM	
-0.86	9.79	10.11	2/6/2015 1:51:40 PM	
-0.86	9.79	10.11	2/6/2015 1:52:45 PM	CO2,O2BiasCOZero
-0.86	9.80	10.11	2/6/2015 1:53:49 PM	
-0.86	9.80	10.11	2/6/2015 1:54:54 PM	
-0.86	9.80	10.11	2/6/2015 1:55:58 PM	
-0.86	9.80	10.11	2/6/2015 1:57:03 PM	
-0.86	9.80	10.11	2/6/2015 1:58:07 PM	
-0.86	9.80	10.11	2/6/2015 1:59:12 PM	
-0.86	9.80	10.11	2/6/2015 2:00:16 PM	
-0.86	9.80	10.11	2/6/2015 2:01:21 PM	
-0.86	9.80	10.11	2/6/2015 2:02:25 PM	
-0.86	9.80	10.11	2/6/2015 2:03:30 PM	
-0.86	9.80	10.11	2/6/2015 2:04:34 PM	
-0.86	9.80	10.11	2/6/2015 2:05:39 PM	
-0.86	4.91	16.60	2/6/2015 2:06:43 PM	
-0.98	0.47	20.94	2/6/2015 2:07:48 PM	
-0.98	0.47	20.95	2/6/2015 2:08:52 PM	
-0.98	0.46	20.95	2/6/2015 2:09:57 PM	
-0.98	0.47	20.95	2/6/2015 2:11:01 PM	
-0.73	0.47	20.95	2/6/2015 2:12:06 PM	
-0.86	0.47	20.96	2/6/2015 2:13:11 PM	
-0.86	0.47	20.96	2/6/2015 2:14:15 PM	
-0.98	0.47	20.96	2/6/2015 2:15:20 PM	
-0.98	0.47	20.97	2/6/2015 2:16:24 PM	
-0.37	0.47	20.97	2/6/2015 2:17:29 PM	
-0.73	0.46	20.97	2/6/2015 2:18:33 PM	
-0.73	0.47	20.97	2/6/2015 2:19:37 PM	
0.00	0.46	20.97	2/6/2015 2:20:42 PM	
-0.25	0.47	20.97	2/6/2015 2:21:47 PM	
0.12	0.47	20.97	2/6/2015 2:22:51 PM	
0.12	0.47	20.97	2/6/2015 2:23:56 PM	
0.12	0.47	20.96	2/6/2015 2:25:00 PM	
0.12	0.47	20.96	2/6/2015 2:26:05 PM	
0.12	0.47	20.97	2/6/2015 2:27:09 PM	
0.12	0.47	20.97	2/6/2015 2:28:14 PM	
0.12	0.47	20.96	2/6/2015 2:29:18 PM	
0.12	0.47	20.96	2/6/2015 2:30:23 PM	
0.12	0.47	20.96	2/6/2015 2:31:27 PM	
0.12	0.47	20.96	2/6/2015 2:32:32 PM	
0.12	0.47	20.96	2/6/2015 2:33:36 PM	
0.12	0.47	20.95	2/6/2015 2:34:41 PM	
0.12	0.46	20.95	2/6/2015 2:35:45 PM	
0.12	0.47	20.95	2/6/2015 2:36:50 PM	
0.12	0.47	20.95	2/6/2015 2:37:54 PM	
0.12	0.47	20.95	2/6/2015 2:38:59 PM	
0.12	0.46	20.96	2/6/2015 2:40:03 PM	
0.12	2.93	15.88	2/6/2015 2:41:08 PM	
0.24	2.98	16.45	2/6/2015 2:42:12 PM	
0.24	2.72	16.87	2/6/2015 2:43:17 PM	

0.12	2.17	18.00	2/6/2015 2:44:21 PM	StartRun2
0.98	3.46	16.64	2/6/2015 2:45:26 PM	
2.20	3.20	16.66	2/6/2015 2:46:30 PM	
1.34	3.44	16.35	2/6/2015 2:47:35 PM	
1.22	3.29	16.80	2/6/2015 2:48:40 PM	
1.34	3.37	16.73	2/6/2015 2:49:44 PM	
2.20	3.57	16.34	2/6/2015 2:50:49 PM	
2.93	3.38	16.99	2/6/2015 2:51:53 PM	
3.78	3.79	16.23	2/6/2015 2:52:58 PM	
4.15	3.45	16.79	2/6/2015 2:54:02 PM	
9.03	3.84	16.08	2/6/2015 2:55:07 PM	
4.39	3.23	17.08	2/6/2015 2:56:11 PM	
3.54	3.36	16.79	2/6/2015 2:57:16 PM	
3.29	3.42	16.72	2/6/2015 2:58:20 PM	
3.17	3.30	16.89	2/6/2015 2:59:25 PM	
3.17	3.29	16.86	2/6/2015 3:00:29 PM	
2.81	3.33	16.81	2/6/2015 3:01:34 PM	
2.20	3.30	16.84	2/6/2015 3:02:38 PM	
2.20	3.30	16.79	2/6/2015 3:03:43 PM	
2.32	3.36	16.71	2/6/2015 3:04:47 PM	
2.32	3.38	16.69	2/6/2015 3:05:52 PM	
1.34	3.35	16.70	2/6/2015 3:06:56 PM	
1.22	3.36	16.69	2/6/2015 3:08:01 PM	
1.22	3.28	16.80	2/6/2015 3:09:05 PM	
1.22	3.30	16.78	2/6/2015 3:10:10 PM	
1.22	3.28	16.81	2/6/2015 3:11:14 PM	
1.22	3.24	16.83	2/6/2015 3:12:19 PM	
1.34	3.23	16.85	2/6/2015 3:13:23 PM	
1.22	3.20	16.89	2/6/2015 3:14:28 PM	
1.10	3.16	16.96	2/6/2015 3:15:32 PM	
0.24	3.21	16.83	2/6/2015 3:16:37 PM	
0.24	3.27	16.77	2/6/2015 3:17:41 PM	
0.24	3.25	16.80	2/6/2015 3:18:46 PM	
0.24	3.23	16.80	2/6/2015 3:19:50 PM	
0.24	3.25	16.79	2/6/2015 3:20:55 PM	
0.24	3.23	16.85	2/6/2015 3:21:59 PM	
0.24	3.23	16.85	2/6/2015 3:23:04 PM	
0.24	3.19	16.95	2/6/2015 3:24:09 PM	
0.24	3.20	16.87	2/6/2015 3:25:13 PM	
0.24	3.21	16.88	2/6/2015 3:26:18 PM	
0.24	3.29	16.73	2/6/2015 3:27:22 PM	
0.24	3.33	16.70	2/6/2015 3:28:27 PM	
0.24	3.29	16.75	2/6/2015 3:29:31 PM	
0.24	3.25	16.82	2/6/2015 3:30:36 PM	
0.24	3.20	16.88	2/6/2015 3:31:40 PM	
0.24	3.18	16.91	2/6/2015 3:32:45 PM	
0.61	3.20	16.88	2/6/2015 3:33:49 PM	
0.24	3.17	16.96	2/6/2015 3:34:54 PM	
0.24	3.27	16.73	2/6/2015 3:35:58 PM	
0.24	3.31	16.73	2/6/2015 3:37:03 PM	
0.24	3.32	16.69	2/6/2015 3:38:07 PM	
0.24	3.33	16.67	2/6/2015 3:39:12 PM	
0.24	3.33	16.72	2/6/2015 3:40:16 PM	
0.24	3.33	16.71	2/6/2015 3:41:21 PM	
0.24	3.31	16.74	2/6/2015 3:42:25 PM	
0.24	3.29	16.77	2/6/2015 3:43:30 PM	
0.49	3.27	16.80	2/6/2015 3:44:34 PM	
1.35	3.29	16.78		Avg 1
0.24	3.20	17.53	2/6/2015 3:45:39 PM	PortChange
0.12	0.60	20.91	2/6/2015 3:46:43 PM	
-0.12	0.47	20.92	2/6/2015 3:47:48 PM	
-0.86	0.47	20.93	2/6/2015 3:48:52 PM	

-0.86	0.47	20.93	2/6/2015 3:49:57 PM	
-0.86	0.47	20.93	2/6/2015 3:51:01 PM	
-0.86	0.68	19.87	2/6/2015 3:52:06 PM	
-0.86	3.00	16.99	2/6/2015 3:53:10 PM	
0.24	3.23	16.80	2/6/2015 3:54:15 PM	
0.24	3.23	16.80	2/6/2015 3:55:19 PM	PortChange
0.24	3.22	16.87	2/6/2015 3:56:24 PM	
0.24	3.18	16.91	2/6/2015 3:57:28 PM	
0.24	3.18	16.90	2/6/2015 3:58:33 PM	
0.24	3.21	16.76	2/6/2015 3:59:38 PM	
0.24	3.30	16.72	2/6/2015 4:00:42 PM	
0.24	3.26	16.76	2/6/2015 4:01:47 PM	
0.24	3.23	16.82	2/6/2015 4:02:51 PM	
0.24	3.18	16.90	2/6/2015 4:03:56 PM	
0.24	3.16	16.91	2/6/2015 4:05:00 PM	
0.24	3.16	16.92	2/6/2015 4:06:05 PM	
0.24	3.13	16.95	2/6/2015 4:07:09 PM	
0.24	3.10	16.99	2/6/2015 4:08:14 PM	
0.24	3.21	16.73	2/6/2015 4:09:18 PM	
0.24	3.30	16.66	2/6/2015 4:10:23 PM	
0.24	3.26	16.73	2/6/2015 4:11:27 PM	
0.24	3.24	16.71	2/6/2015 4:12:32 PM	
0.24	2.76	18.44	2/6/2015 4:13:36 PM	
0.24	3.05	16.14	2/6/2015 4:14:41 PM	
0.24	3.60	16.59	2/6/2015 4:15:45 PM	
-0.61	3.34	16.51	2/6/2015 4:16:50 PM	
-0.12	3.34	16.57	2/6/2015 4:17:54 PM	
0.24	3.24	16.67	2/6/2015 4:18:59 PM	
0.24	3.06	17.22	2/6/2015 4:20:03 PM	
-0.12	3.09	16.86	2/6/2015 4:21:08 PM	
-0.86	3.17	16.99	2/6/2015 4:22:12 PM	
-0.73	3.06	16.52	2/6/2015 4:23:17 PM	
-0.61	3.47	16.52	2/6/2015 4:24:21 PM	
0.24	3.07	16.70	2/6/2015 4:25:26 PM	
0.24	3.05	17.32	2/6/2015 4:26:30 PM	
-0.12	2.97	16.90	2/6/2015 4:27:35 PM	
-0.86	3.05	17.16	2/6/2015 4:28:39 PM	
-0.86	3.09	16.90	2/6/2015 4:29:44 PM	
-0.61	2.94	16.57	2/6/2015 4:30:48 PM	
-0.49	3.30	16.38	2/6/2015 4:31:53 PM	
-0.86	3.24	16.62	2/6/2015 4:32:57 PM	
-0.86	3.05	17.63	2/6/2015 4:34:02 PM	
-0.86	2.72	17.59	2/6/2015 4:35:07 PM	
-0.86	2.76	16.82	2/6/2015 4:36:11 PM	
-0.86	3.22	16.08	2/6/2015 4:37:16 PM	
-0.61	3.37	16.60	2/6/2015 4:38:20 PM	
-0.86	3.14	16.79	2/6/2015 4:39:25 PM	
-0.73	3.04	16.87	2/6/2015 4:40:29 PM	
-0.86	2.99	16.89	2/6/2015 4:41:34 PM	
-0.86	2.98	16.84	2/6/2015 4:42:38 PM	
-0.73	2.99	16.84	2/6/2015 4:43:43 PM	
-0.12	2.99	16.92	2/6/2015 4:44:47 PM	
-0.86	2.96	16.75	2/6/2015 4:45:52 PM	
-0.86	3.01	16.82	2/6/2015 4:46:56 PM	
-0.25	2.99	16.81	2/6/2015 4:48:01 PM	
-0.73	2.97	16.83	2/6/2015 4:49:05 PM	
-0.86	2.96	16.90	2/6/2015 4:50:10 PM	
-0.86	2.93	16.89	2/6/2015 4:51:14 PM	
-0.86	2.92	16.92	2/6/2015 4:52:19 PM	
-0.86	2.90	16.79	2/6/2015 4:53:23 PM	
-0.86	2.94	16.80	2/6/2015 4:54:28 PM	
-0.61	2.96	16.82	2/6/2015 4:55:32 PM	StopRun2

-0.30	3.11	16.84		Avg 2
0.52	3.20	16.81		Total Avg
-0.86	2.94	18.47	2/6/2015 4:56:37 PM	
-0.86	2.50	20.93	2/6/2015 4:57:41 PM	
-0.86	0.86	20.94	2/6/2015 4:58:46 PM	
-0.86	0.46	20.94	2/6/2015 4:59:50 PM	
-0.61	0.47	20.94	2/6/2015 5:00:55 PM	
-0.73	0.47	20.94	2/6/2015 5:01:59 PM	
-0.73	0.46	20.94	2/6/2015 5:03:04 PM	
-0.86	0.47	20.94	2/6/2015 5:04:08 PM	
-0.86	0.47	15.55	2/6/2015 5:05:13 PM	
2.93	0.47	0.24	2/6/2015 5:06:17 PM	
18.55	0.47	0.18	2/6/2015 5:07:22 PM	
24.17	0.47	0.15	2/6/2015 5:08:27 PM	
25.15	0.46	0.13	2/6/2015 5:09:31 PM	
25.15	0.47	0.13	2/6/2015 5:10:36 PM	COBiasCO2,O2Zero
25.15	3.62	4.26	2/6/2015 5:11:40 PM	
21.73	9.78	10.11	2/6/2015 5:12:45 PM	
5.86	9.82	10.12	2/6/2015 5:13:49 PM	
0.73	9.83	10.13	2/6/2015 5:14:54 PM	
0.24	9.84	10.13	2/6/2015 5:15:58 PM	
-0.73	9.84	10.13	2/6/2015 5:17:03 PM	CO2,O2BiasCOZero
-0.86	6.37	14.23	2/6/2015 5:18:07 PM	
-0.73	0.47	20.99	2/6/2015 5:19:12 PM	
-0.86	0.47	21.01	2/6/2015 5:20:16 PM	
-0.86	0.47	21.01	2/6/2015 5:21:21 PM	
-0.86	0.47	21.01	2/6/2015 5:22:25 PM	
-0.86	0.47	21.02	2/6/2015 5:23:30 PM	
-0.86	0.47	21.02	2/6/2015 5:24:34 PM	
-0.86	0.47	21.02	2/6/2015 5:25:39 PM	
-0.73	0.47	21.02	2/6/2015 5:26:43 PM	
-0.61	0.47	21.02	2/6/2015 5:27:48 PM	
-0.12	0.47	21.01	2/6/2015 5:28:52 PM	
0.00	0.47	21.01	2/6/2015 5:29:57 PM	
0.00	0.47	20.98	2/6/2015 5:31:01 PM	
19.90	0.47	20.91	2/6/2015 5:32:06 PM	
131.59	0.47	20.93	2/6/2015 5:33:10 PM	
168.58	0.47	20.94	2/6/2015 5:34:15 PM	
158.32	0.47	20.94	2/6/2015 5:35:19 PM	
141.60	0.47	20.95	2/6/2015 5:36:24 PM	
123.53	6.73	13.59	2/6/2015 5:37:28 PM	
75.44	9.79	10.14	2/6/2015 5:38:33 PM	
14.77	9.81	10.13	2/6/2015 5:39:37 PM	
2.20	9.83	10.13	2/6/2015 5:40:42 PM	
0.24	9.83	10.13	2/6/2015 5:41:46 PM	
0.12	2.62	17.71	2/6/2015 5:42:51 PM	
0.12	2.21	18.07	2/6/2015 5:43:56 PM	
0.12	2.19	18.08	2/6/2015 5:45:00 PM	Startrun3
0.12	3.74	16.58	2/6/2015 5:46:05 PM	
0.73	3.09	17.48	2/6/2015 5:47:09 PM	
1.59	3.70	16.41	2/6/2015 5:48:14 PM	
1.22	3.78	16.72	2/6/2015 5:49:18 PM	
1.22	4.11	16.41	2/6/2015 5:50:23 PM	
1.22	3.67	16.82	2/6/2015 5:51:27 PM	
1.22	3.64	16.51	2/6/2015 5:52:32 PM	
1.22	3.40	16.93	2/6/2015 5:53:36 PM	
2.07	3.43	16.77	2/6/2015 5:54:41 PM	
3.17	3.52	16.46	2/6/2015 5:55:45 PM	
2.44	3.29	16.91	2/6/2015 5:56:50 PM	
1.46	3.41	16.58	2/6/2015 5:57:54 PM	

1.22	3.26	16.89	2/6/2015 5:58:59 PM	
1.22	3.38	16.68	2/6/2015 6:00:03 PM	
1.22	3.32	16.76	2/6/2015 6:01:08 PM	
1.22	3.24	16.88	2/6/2015 6:02:12 PM	
1.22	3.36	16.68	2/6/2015 6:03:17 PM	
1.22	3.35	16.69	2/6/2015 6:04:21 PM	
0.85	3.30	16.75	2/6/2015 6:05:26 PM	
0.12	3.24	16.85	2/6/2015 6:06:30 PM	
0.12	3.25	16.83	2/6/2015 6:07:35 PM	
0.12	3.24	16.84	2/6/2015 6:08:39 PM	
0.12	3.30	16.73	2/6/2015 6:09:44 PM	
0.12	3.26	16.77	2/6/2015 6:10:48 PM	
0.12	3.19	16.88	2/6/2015 6:11:53 PM	
0.12	3.16	16.93	2/6/2015 6:12:57 PM	
0.24	3.30	16.68	2/6/2015 6:14:02 PM	
0.12	3.26	16.75	2/6/2015 6:15:06 PM	
0.12	2.61	18.09	2/6/2015 6:16:11 PM	
0.12	3.66	15.89	2/6/2015 6:17:15 PM	
0.12	2.99	17.15	2/6/2015 6:18:20 PM	
0.24	3.30	16.64	2/6/2015 6:19:25 PM	
0.12	3.28	16.66	2/6/2015 6:20:29 PM	
0.12	3.23	16.74	2/6/2015 6:21:34 PM	
0.12	3.17	16.85	2/6/2015 6:22:38 PM	
0.24	3.12	16.93	2/6/2015 6:23:43 PM	
0.12	3.00	17.12	2/6/2015 6:24:47 PM	
0.12	2.94	17.19	2/6/2015 6:25:52 PM	
0.12	2.89	17.26	2/6/2015 6:26:56 PM	
0.12	2.86	17.32	2/6/2015 6:28:01 PM	
0.12	2.80	17.42	2/6/2015 6:29:05 PM	
0.12	2.92	17.20	2/6/2015 6:30:10 PM	
0.12	2.40	18.31	2/6/2015 6:31:14 PM	
0.12	2.89	17.28	2/6/2015 6:32:19 PM	
0.12	3.00	17.06	2/6/2015 6:33:23 PM	
0.49	3.09	16.89	2/6/2015 6:34:28 PM	
0.12	3.28	16.57	2/6/2015 6:35:32 PM	
0.12	3.28	16.55	2/6/2015 6:36:37 PM	
0.12	3.21	16.66	2/6/2015 6:37:41 PM	
0.12	3.13	16.78	2/6/2015 6:38:46 PM	
0.12	2.80	17.50	2/6/2015 6:39:50 PM	
0.12	2.41	18.37	2/6/2015 6:40:55 PM	
0.12	3.38	16.43	2/6/2015 6:41:59 PM	
0.12	3.10	16.86	2/6/2015 6:43:04 PM	
0.12	3.17	16.76	2/6/2015 6:44:08 PM	
0.12	3.12	16.83	2/6/2015 6:45:13 PM	
0.55	3.20	16.92		Avg 1
0.49	3.09	16.87	2/6/2015 6:46:18 PM	PortChange
0.12	0.87	20.34	2/6/2015 6:47:22 PM	
0.12	0.47	20.96	2/6/2015 6:48:26 PM	
0.12	0.47	20.96	2/6/2015 6:49:31 PM	
0.12	0.46	20.98	2/6/2015 6:50:35 PM	
0.12	0.46	20.99	2/6/2015 6:51:40 PM	
0.12	0.47	20.99	2/6/2015 6:52:44 PM	
0.12	0.47	20.99	2/6/2015 6:53:49 PM	
0.12	0.70	20.58	2/6/2015 6:54:54 PM	
0.12	3.15	16.66	2/6/2015 6:55:58 PM	
0.12	3.54	15.95	2/6/2015 6:57:03 PM	
0.12	3.04	16.76	2/6/2015 6:58:07 PM	PortChange
0.12	2.31	18.15	2/6/2015 6:59:12 PM	
0.12	2.62	17.59	2/6/2015 7:00:16 PM	
0.12	2.87	17.14	2/6/2015 7:01:21 PM	
0.12	2.89	17.08	2/6/2015 7:02:25 PM	

0.12	3.70	15.51	2/6/2015 7:03:30 PM	
0.12	2.56	17.61	2/6/2015 7:04:34 PM	
0.12	2.40	17.94	2/6/2015 7:05:39 PM	
0.12	2.70	17.37	2/6/2015 7:06:43 PM	
0.12	2.75	17.28	2/6/2015 7:07:48 PM	
0.12	3.54	15.71	2/6/2015 7:08:52 PM	
0.12	3.13	16.45	2/6/2015 7:09:57 PM	
0.12	2.50	17.68	2/6/2015 7:11:01 PM	
0.49	2.85	17.07	2/6/2015 7:12:06 PM	
0.12	1.84	18.82	2/6/2015 7:13:10 PM	
0.12	2.86	17.05	2/6/2015 7:14:15 PM	
0.12	2.81	17.14	2/6/2015 7:15:19 PM	
0.12	2.61	17.49	2/6/2015 7:16:24 PM	
0.12	2.71	17.30	2/6/2015 7:17:28 PM	
0.61	3.13	16.38	2/6/2015 7:18:33 PM	
0.12	2.98	16.64	2/6/2015 7:19:37 PM	
0.12	2.83	16.91	2/6/2015 7:20:42 PM	
0.12	2.83	16.90	2/6/2015 7:21:47 PM	
0.12	2.82	16.90	2/6/2015 7:22:51 PM	
0.12	2.81	16.92	2/6/2015 7:23:55 PM	
0.12	2.86	16.82	2/6/2015 7:25:00 PM	
0.12	2.82	16.90	2/6/2015 7:26:04 PM	
0.12	2.63	17.31	2/6/2015 7:27:09 PM	
0.12	2.33	17.93	2/6/2015 7:28:13 PM	
0.37	3.01	16.54	2/6/2015 7:29:18 PM	
0.12	2.82	16.89	2/6/2015 7:30:23 PM	
0.12	2.82	16.89	2/6/2015 7:31:27 PM	
0.12	2.74	17.05	2/6/2015 7:32:32 PM	
0.12	2.08	18.36	2/6/2015 7:33:36 PM	
0.12	2.80	16.89	2/6/2015 7:34:41 PM	
0.12	2.80	16.88	2/6/2015 7:35:45 PM	
0.12	2.79	16.88	2/6/2015 7:36:50 PM	
0.12	2.75	16.95	2/6/2015 7:37:54 PM	
0.37	2.75	16.94	2/6/2015 7:38:59 PM	
0.12	2.80	16.82	2/6/2015 7:40:03 PM	
0.12	2.18	18.10	2/6/2015 7:41:08 PM	
0.12	2.34	17.79	2/6/2015 7:42:12 PM	
0.12	2.44	17.55	2/6/2015 7:43:17 PM	
0.12	2.72	17.00	2/6/2015 7:44:21 PM	
0.12	2.06	18.28	2/6/2015 7:45:26 PM	
0.12	2.26	17.91	2/6/2015 7:46:30 PM	
0.12	1.91	18.43	2/6/2015 7:47:35 PM	
0.98	1.11	19.51	2/6/2015 7:48:39 PM	
0.24	2.81	16.74	2/6/2015 7:49:44 PM	
0.12	2.81	16.75	2/6/2015 7:50:48 PM	
0.12	2.38	17.63	2/6/2015 7:51:53 PM	
0.12	2.07	18.23	2/6/2015 7:52:57 PM	
0.12	2.70	16.92	2/6/2015 7:54:02 PM	
0.12	2.60	17.15	2/6/2015 7:55:06 PM	
0.12	2.11	18.14	2/6/2015 7:56:11 PM	
0.12	2.50	17.31	2/6/2015 7:57:16 PM	
0.12	2.76	16.82	2/6/2015 7:58:20 PM	
0.12	2.04	18.23	2/6/2015 7:59:24 PM	StopRun3
0.16	2.62	17.29		Avg 2
0.35	2.91	17.11		Total Avg
0.24	2.03	18.23	2/6/2015 8:00:29 PM	
0.12	0.66	20.59	2/6/2015 8:01:33 PM	
0.12	0.47	20.97	2/6/2015 8:02:38 PM	
0.12	0.47	20.98	2/6/2015 8:03:42 PM	
0.12	0.47	20.98	2/6/2015 8:04:47 PM	
0.24	0.47	20.99	2/6/2015 8:05:52 PM	

0.85	0.47	20.99	2/6/2015 8:06:56 PM	
0.24	0.99	4.03	2/6/2015 8:08:01 PM	
8.91	0.47	0.22	2/6/2015 8:09:05 PM	
21.97	0.47	0.16	2/6/2015 8:10:10 PM	
25.02	0.47	0.16	2/6/2015 8:11:14 PM	
25.76	0.47	0.14	2/6/2015 8:12:19 PM	COBiasCO2,O2Zero
26.12	3.76	3.88	2/6/2015 8:13:23 PM	
22.46	9.69	10.07	2/6/2015 8:14:28 PM	
6.71	9.74	10.10	2/6/2015 8:15:32 PM	
1.10	9.76	10.10	2/6/2015 8:16:37 PM	
0.12	9.77	10.11	2/6/2015 8:17:41 PM	
0.12	9.78	10.11	2/6/2015 8:18:46 PM	CO2,O2BiasCOZero
9.28	4.65	11.80	2/6/2015 8:19:50 PM	

Appendix #5

Process Data

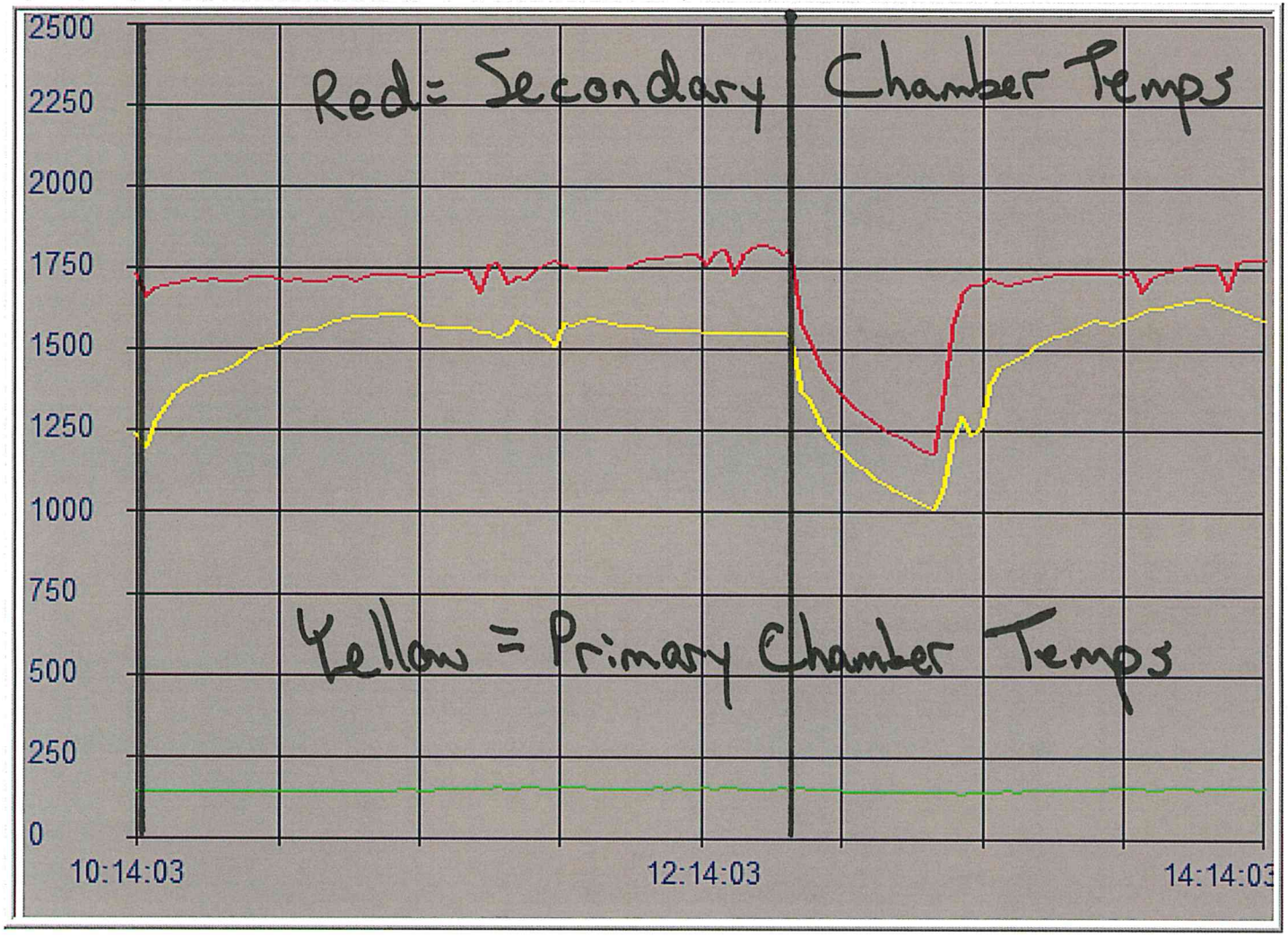
Test #1 FT II SE 10:15AM → 12:31PM

Swan Point Chamber No. 1

Trend Graphs

Title: Temperatures

Close



Primary Chamber (0-2500F)
SCC Inlet (0-2500F)
Flue Gas (0-2500F)
SCC Outlet (0-2500F)

Background
Grid Colour
Label

<- ->

Display Start: 05-Feb-15 10:14 AM

Display Duration: 4 Hours

Time per Division: 30 Minutes

Trace Data | Print

Cremation Report Format 2 Thu Feb 05 12:31:49 2015

Swan Point

Cremator Number: 1

Cremation Number: 1

Operators Name: bill

Deceased Name: GAVITT

Funeral Director: UMF

Notes: 148

Cremation Reference Number: C6827

Disposition of Cremated remains: 0

Cremation start time 2/5/2015 10:15:36 AM Cremation stop time 2/5/2015 12:31:44 PM

Cremation time 136 minutes

Final processing of cremated remains / / : :

Name and Address of Authorising Agent
0
0
0
0
0

Note
A photocopy of the disposition permit should be attached to the report
Time and date that final processing of cremated remains was completed should be written on the report

==========
♀

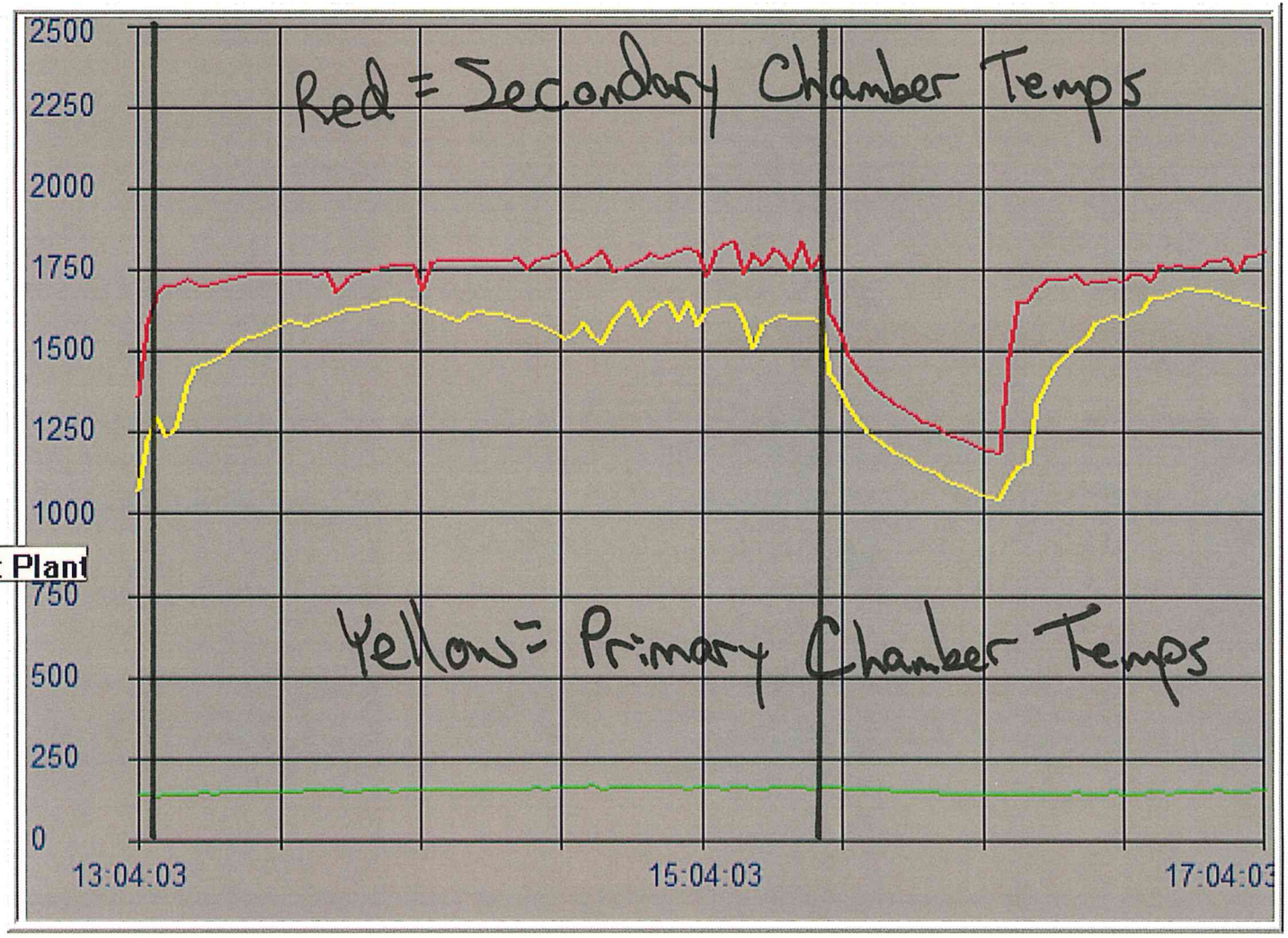
Test #2 FT II SE 1:11PM → 3:27 PM

Swan Point Chamber No. 1

Trend Graphs

Title: Temperatures

Close



Primary Chamber (0-2500F)
SCC Inlet (0-2500F)
Flue Gas (0-2500F)
SCC Outlet (0-2500F)

Background
Grid Colour
Label

<- ->

Display Start
05-Feb-15 1:04 PM

Display Duration
4 Hours

Time per Division
30 Minutes

Trace Data Print

Cremation Report Format 2 Thu Feb 05 15:27:47 2015

Swan Point

Cremator Number: 1

Cremation Number: 2

Operators Name: bill

Deceased Name: VIVIAN LEMERICK-HEALY

Funeral Director: SWAN POINT

Notes: 182 LBS

Cremation Reference Number: C6828

Disposition of Cremated remains: 0

Cremation start time 2/5/2015 1:11:01 PM Cremation stop time 2/5/2015 3:27:43 PM

Cremation time 136 minutes

Final processing of cremated remains / / : :

Name and Address of Authorising Agent
0
0
0
0
0

Note
A photocopy of the disposition permit should be attached to the report
Time and date that final processing of cremated remains was completed should be written on the report

==========
♀

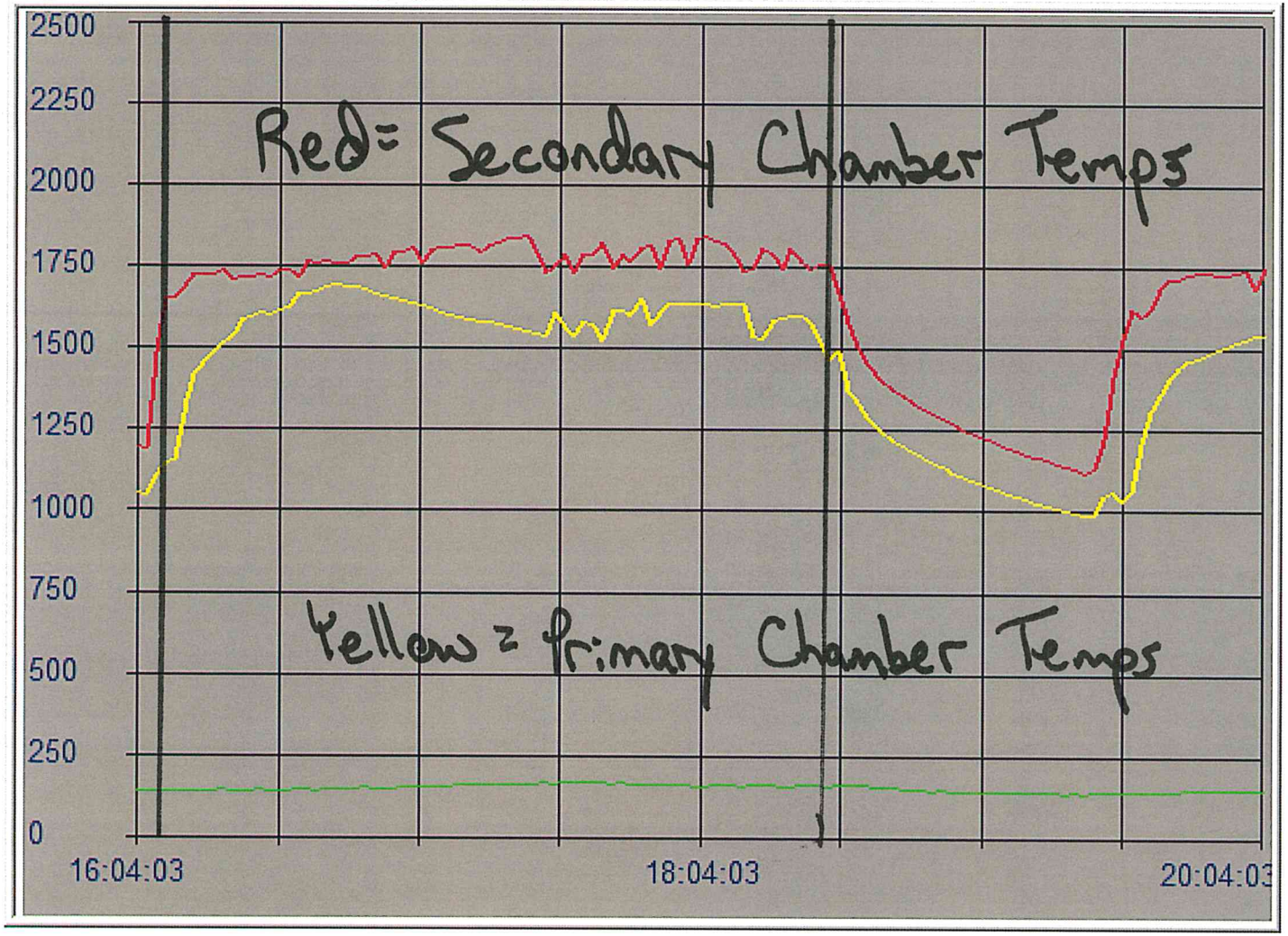
Test #3 FT II SE 4:11PM → 6:31PM

Swan Point Chamber No. 1

Trend Graphs

Title: Temperatures

Close



Primary Chamber (0-2500F)
SCC Inlet (0-2500F)
Flue Gas (0-2500F)
SCC Outlet (0-2500F)

Background
Grid Colour
Label

<- ->

Display Start: 05-Feb-15 4:04 PM

Display Duration: 4 Hours

Time per Division: 30 Minutes

Trace Data | Print

Ready: 12/30/1899 12:00:00 AM

Cremation Report Format 2 Thu Feb 05 18:31:12 2015

Swan Point

Cremator Number: 1

Cremation Number: 3

Operators Name: bill

Deceased Name: GORMAN

Funeral Director: GALLOGLY

Notes: 159

Cremation Reference Number: C6829

Disposition of Cremated remains: 0

Cremation start time 2/5/2015 4:11:42 PM Cremation stop time 2/5/2015 6:31:08 PM

Cremation time 139 minutes

Final processing of cremated remains / / : :

Name and Address of Authorising Agent
0
0
0
0
0

Note
A photocopy of the disposition permit should be attached to the report
Time and date that final processing of cremated remains was completed should be written on the report

==========
♀

Medical Test #1 7:34PM → 9:49 PM

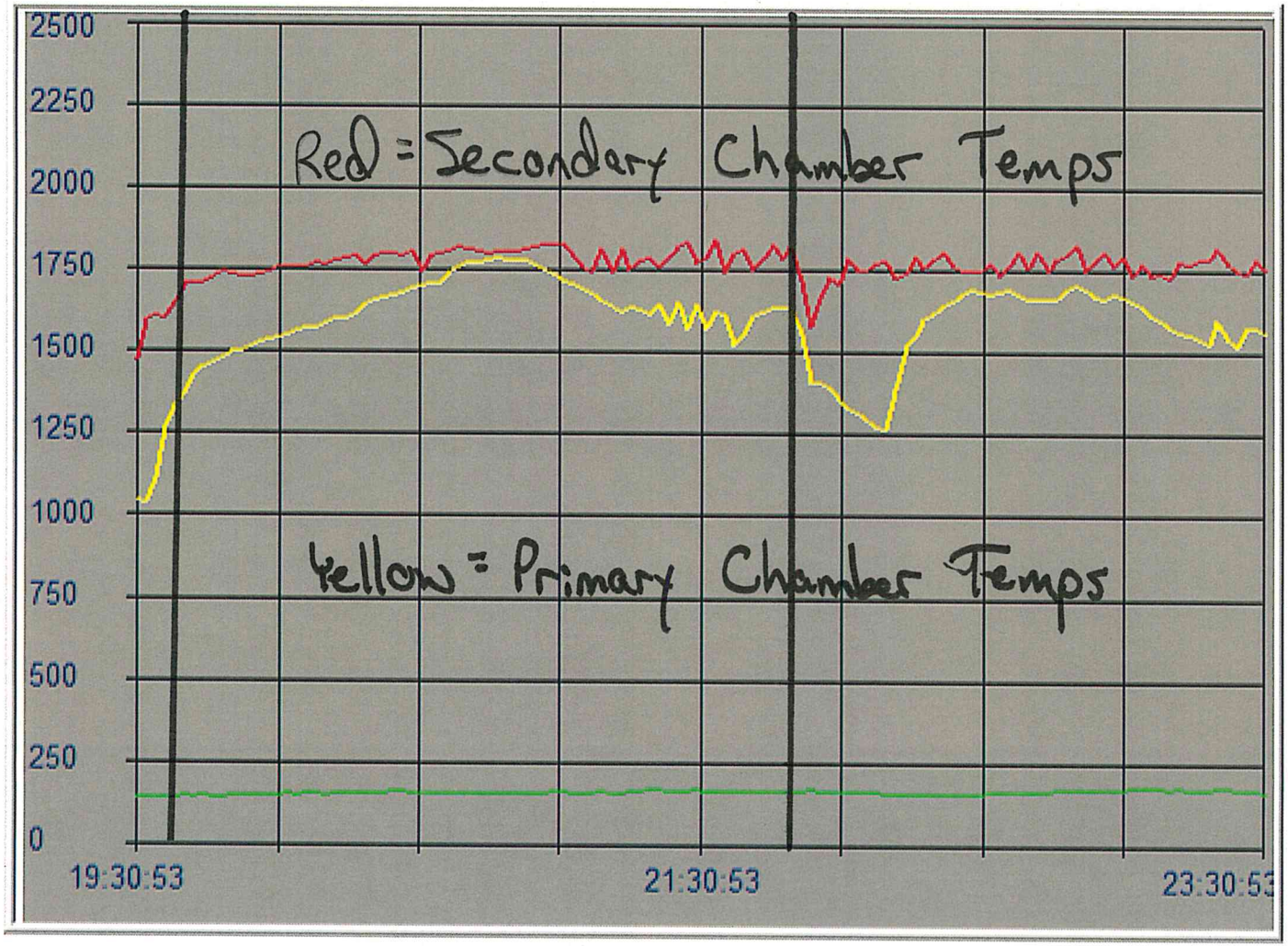
Swan Point FT II SE (Test Run #4) Chamber No. 1

t is complete

Trend Graphs

Title: Temperatures

Close



Primary Chamber (0-2500F)
SCC Inlet (0-2500F)
Flue Gas (0-2500F)
SCC Outlet (0-2500F)

Background
Grid Colour
Label

<- ->

Display Start: 05-Feb-15 7:30 PM

Display Duration: 4 Hours

Time per Division: 30 Minutes

Trace Data | Print

C6830

Cremation Report Format 2 Thu Feb 05 21:49:34 2015

Swan Point

Cremator Number: 1

Cremation Number: 4

Operators Name: bill

Deceased Name: MARTIN

Funeral Director: MDS

Notes: 230

Cremation Reference Number: C6830

Disposition of Cremated remains: 0

Cremation start time 2/5/2015 7:34:05 PM Cremation stop time 2/5/2015 9:49:31 PM

Cremation time 135 minutes

Final processing of cremated remains / / : :

Name and Address of Authorising Agent
0
0
0
0
0

Note
A photocopy of the disposition permit should be attached to the report
Time and date that final processing of cremated remains was completed should be written on the report

==========
♀

Facultatieve Technologies

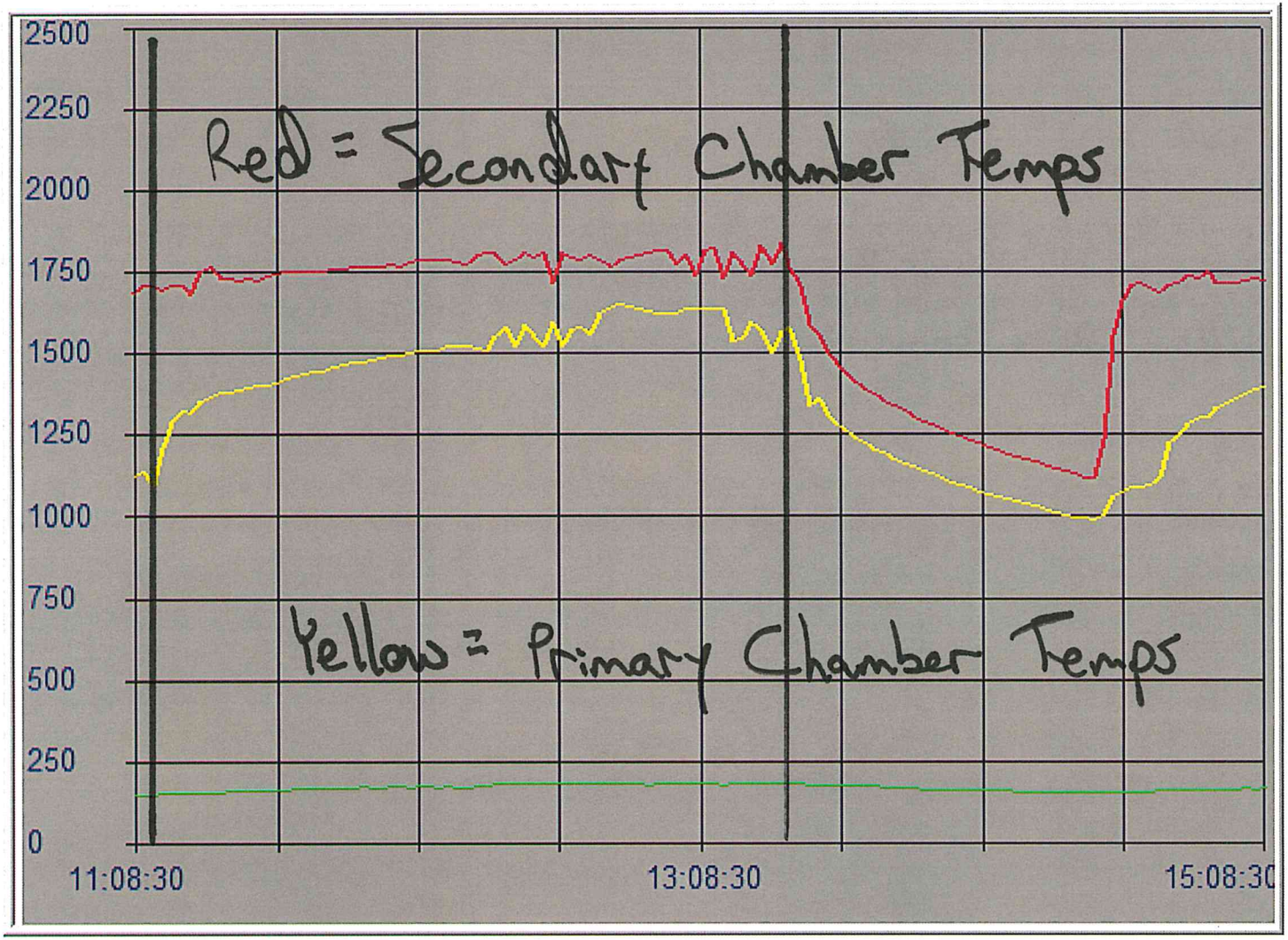
Swan Point Test #1 FT III SE Chamber No. 2

11:12AM → 1:26PM

Trend Graphs

Title: Temperatures

Close



Primary Chamber (0-2500F)
SCC Inlet (0-2500F)
Flue Gas (0-2500F)
SCC Outlet (0-2500F)

Background
Grid Colour
Label

<- ->

Display Start: 06-Feb-15 11:08 AM

Display Duration: 4 Hours

Time per Division: 30 Minutes

Trace Data | Print

FT III SE Test Cremation #1

Cremation Report Format 2 Fri Feb 06 13:26:43 2015

Swan Point

Cremator Number: 2

Cremation Number: 1

Operators Name: Bill

Deceased Name: feinstein

Funeral Director: shalom

Notes: 149

Cremation Reference Number: c6835

Disposition of Cremated remains: 0

Cremation start time 2/6/2015 11:12:25 AM Cremation stop time 2/6/2015 1:26:40 PM

Cremation time 134 minutes

Final processing of cremated remains / / : :

Name and Address of Authorising Agent
0
0
0
0
0

Note
A photocopy of the disposition permit should be attached to the report
Time and date that final processing of cremated remains was completed should be written on the report

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♀

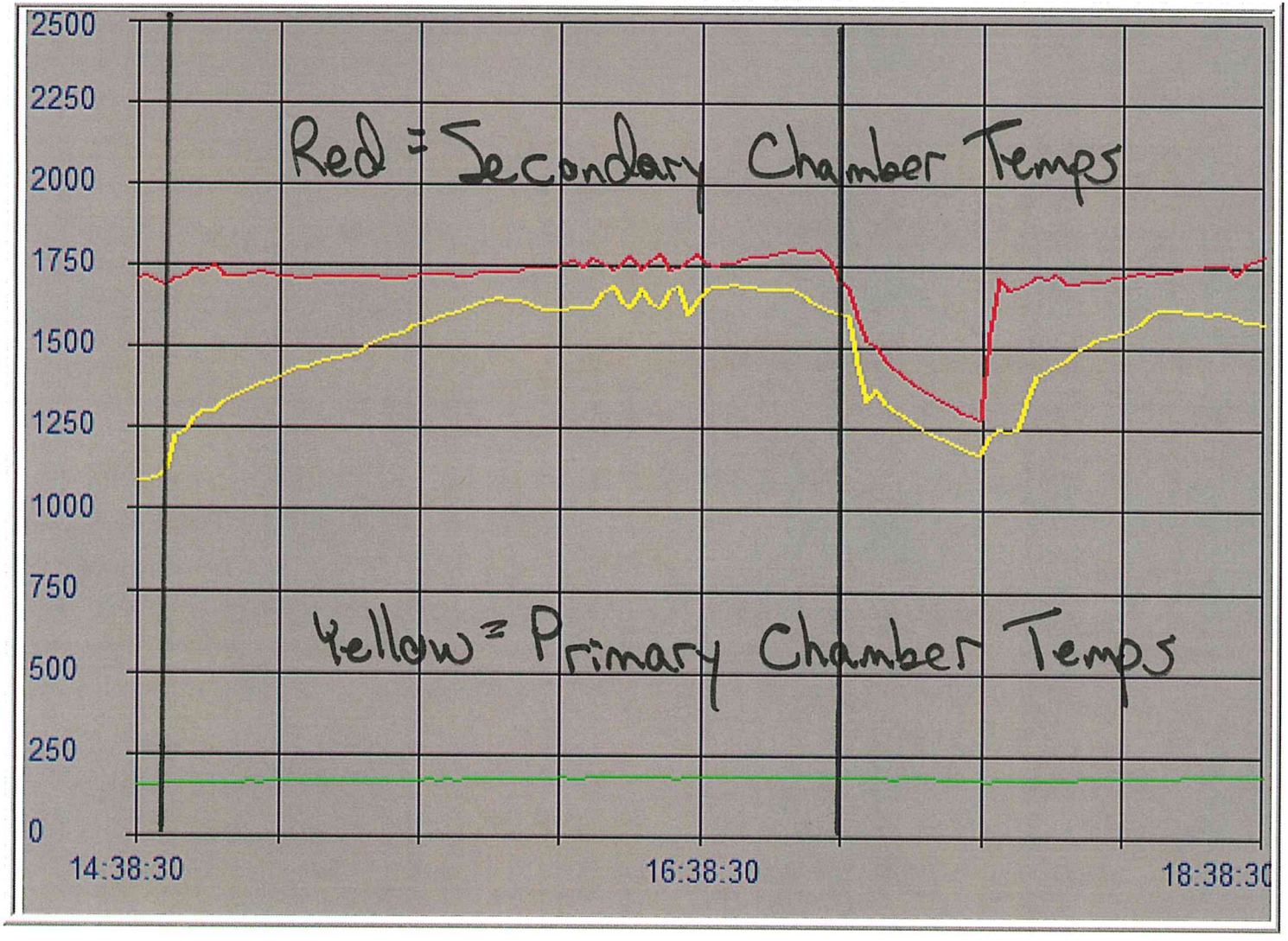
Facultative Technologies

Swan Point Test #2 FT III SE 2:43PM → 5:08PM Chamber No. 2

Trend Graphs

Title: Temperatures

Close



Primary Chamber (0-2500F)

SCC Inlet (0-2500F)

Flue Gas (0-2500F)

SCC Outlet (0-2500F)

Background

Grid Colour

Label

<- ->

Display Start: 06-Feb-15 2:38 PM

Display Duration: 4 Hours

Time per Division: 30 Minutes

Trace Data | Print

FT III SE Test Cremation #2

Cremation Report Format 2 Fri Feb 06 17:08:33 2015

Swan Point

Cremator Number: 2

Cremation Number: 2

Operators Name: bill

Deceased Name: dube

Funeral Director: prata

Notes: 225

Cremation Reference Number: c6836

Disposition of Cremated remains: 0

Cremation start time 2/6/2015 2:43:23 PM Cremation stop time 2/6/2015 5:08:29 PM

Cremation time 145 minutes

Final processing of cremated remains / / : :

Name and Address of Authorising Agent
0
0
0
0
0

Note
A photocopy of the disposition permit should be attached to the report
Time and date that final processing of cremated remains was completed should be written on the report

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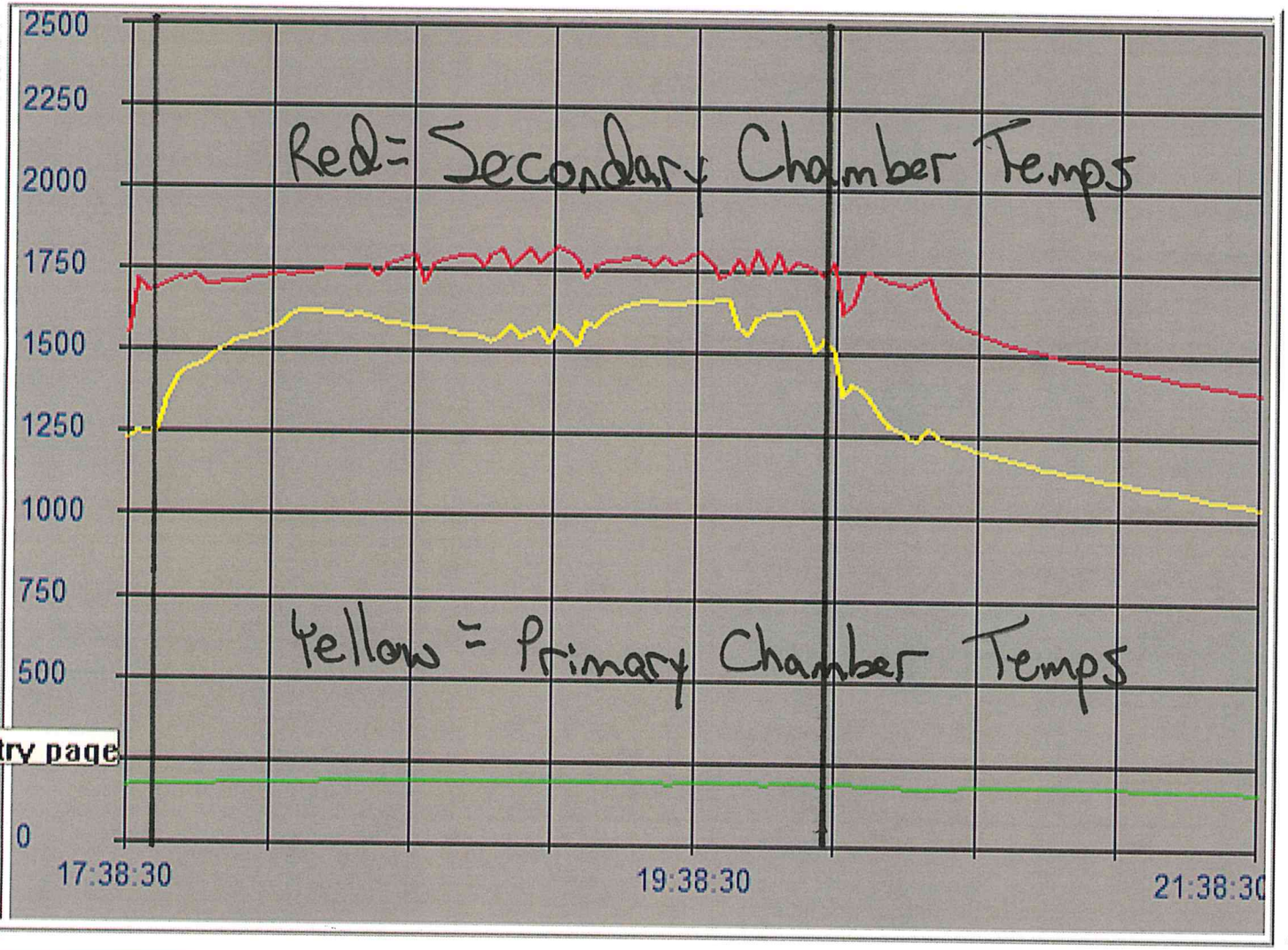
♀

Swan Point Test #3 FT III SE 5:44PM → 8:03PM Chamber No. 2

Trend Graphs

Title: Temperatures

Close



Primary Chamber (0-2500F)
SCC Inlet (0-2500F)
Flue Gas (0-2500F)
SCC Outlet (0-2500F)

Background
Grid Colour
Label

<- ->

Display Start: 06-Feb-15 5:38 PM

Display Duration: 4 Hours

Time per Division: 30 Minutes

Trace Data | Print

ta entry page

FT III SE Test Cremation #3

Cremation Report Format 2 Fri Feb 06 20:03:27 2015

Swan Point

Cremator Number: 2

Cremation Number: 3

Operators Name: bill

Deceased Name: cabral

Funeral Director: sansone

Notes: 142

Cremation Reference Number: c6838

Disposition of Cremated remains: 0

Cremation start time 2/6/2015 5:44:44 PM Cremation stop time 2/6/2015 8:03:23 PM

Cremation time 138 minutes

Final processing of cremated remains / / : :

Name and Address of Authorising Agent
0
0
0
0
0

Note
A photocopy of the disposition permit should be attached to the report
Time and date that final processing of cremated remains was completed should be written on the report

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